



17th ANNUAL SCIENTIFIC MEETING

**Indonesian Society of Thoracic, Cardiac
and Vascular Surgeons.**

*"Advancing Thoracic, Cardiac and Vascular Surgery in Indonesia:
Innovation, Standarization and Equity."*

Proceeding Book

Shangri-La Hotel Jakarta

13-15 August 2026

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Welcoming Remarks

Greetings to all,

With great enthusiasm and anticipation, I am delighted to welcome all distinguished members and residents of the IATCVS community to the 17th Annual Scientific Meeting of the Indonesian Association of Thoracic, Cardiac, and Vascular Surgeons. This year's meeting will be held from August 13th to 15th, 2026, at the Shangri-La Hotel Jakarta.

As we continue to face the growing demand to strengthen cardiothoracic and vascular surgical services across Indonesia, our collective responsibility becomes ever more significant. Expanding access, enhancing quality, and ensuring equitable distribution of advanced surgical care remain central to our mission. The development of thoracic and vascular specialties alongside cardiac surgery is essential to achieving comprehensive and sustainable national health progress.

The theme of this year's meeting, "Advancing Thoracic, Cardiac and Vascular Surgery in Indonesia: Innovation, Standardization, and Equity," reflects our strategic priorities. Innovation drives progress and keeps us aligned with global advancements. Standardization ensures consistency, safety, and measurable outcomes. Equity guarantees that these advancements are accessible to patients throughout the archipelago, not limited to major centers alone.

Throughout this three-day scientific program, participants will engage in plenary lectures, symposia, panel discussions, and hands-on workshops designed to foster knowledge exchange and practical advancement. This meeting is not merely an academic forum, but a platform to refine our standards, strengthen collaboration, and build a unified direction for the future of our specialty.

I extend my sincere appreciation to the organizing committee, speakers, sponsors, and all contributors whose dedication has made this meeting possible. May this 17th Annual Scientific Meeting serve as a catalyst for meaningful progress, professional growth, and tangible improvements in patient care across Indonesia.

Let us move forward with clarity of purpose, shared commitment, and determination to elevate cardiothoracic and vascular surgery in our nation.

Sincerely,

dr. Heston G. B. Napitupulu, Sp.BTKV, Subsp.JD(K), MARS
Organizing Committee





17th ANNUAL SCIENTIFIC MEETING

Indonesian Society of Thoracic, Cardiac
and Vascular Surgeons.



Organizing Comittee

Steering Committee:

Dr. dr. Prasetyo Edi, Sp. BTKV
Dr. dr. Niko Azhari Hidayat, Sp. BTKV

Chairman of Committee:

dr. Heston G. B. Napitupulu, Sp. BTKV

Vice Chairman of the Committee:

dr. Hariadi Hadibrata, Sp. BTKV

Chief of Organizing committee:

dr. Bagus Herlambang, Sp. BTKV, Ph.D

Secretary:

dr. Aris Furqon, Sp. BTKV
dr. Albar Felayati Djaya, Sp. BTKV
dr. Hendwell, AIFO - K, Sp. BTKV

Treasurer:

dr. Franky Siahaan, Sp. BTKV

Scientific:

Pediatric event	: dr. Panji Utomo, Sp. BTKV
Vascular event	: dr. Faizunnur Erfin, Sp. BTKV
Toraks event	: dr. Rynaldo Partogi, Sp. BTKV
Adult Cardiac event	: dr. Aflah Dea, Sp. BTKV

Fundraising Coordinator:

dr. Maizul Anwar, Sp. BTKV
dr. I Putu Kokohana, Sp. BTKV

Accommodation & Transportation:

dr. Kenneth Gad Liempy, Sp. BTKV

Public Relations & Documentation:

dr. Quincy Romano, Sp. BTKV



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SCIENTIFIC MEETING**
Indonesian Society of Thoracic, Cardiac
and Vascular Surgeons.



Acknowledgement

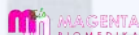
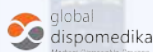
The Organizing Committee of the 17th Annual Scientific Meeting of the Indonesian Society of Thoracic, Cardiac and Vascular Surgeons expresses its sincere gratitude to the following companies for their generous support of the meeting:



PT. PERMATA BUNDA ARTANO

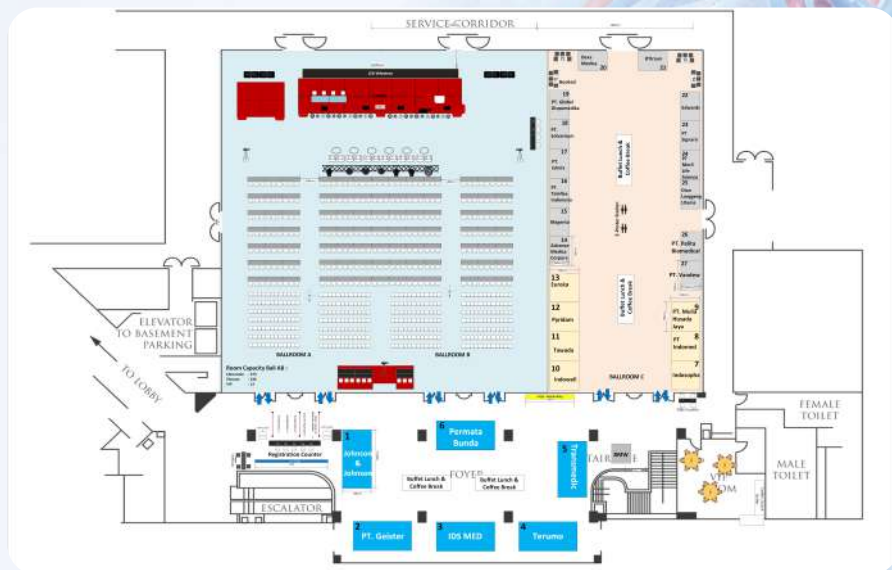
**Johnson & Johnson
MedTech**

transmedic





Exhibition Map



COMPANY	BOOTH	COMPANY	BOOTH
Johnson & Johnson	1	Magenta	15
PT. Geister	2	PT. Teleflex Indonesia	16
IDS Med	3	Gloria	17
Terumo	4	Solvantum	18
Transmedic	5	PT. Global Dispomedika	19
Permatia Bunda	6	Dexa Medica	20
Indosopha	7	B'Braun	21
Indomed	8	Edwards	22
PT. Mulia Husada Jaya	9	PT. Sigvaris	23
Indowell	10	PT. Meril Life Science	24
Tawada	11	Dian Langgeng Utama	25
Pyridam	12	PT. Pelita Biomedical	26
Eureka	13	PT. Vandew	27
Advance Medica Corpora	14	BMW	



17th ANNUAL SCIENTIFIC MEETING

Indonesian Society of Thoracic, Cardiac and Vascular Surgeons.



Our Venue

Shangri-La Hotel Jakarta

Experience world-class hospitality at the heart of Indonesia's vibrant capital. Shangri-La Hotel Jakarta offers the perfect setting for knowledge exchange, networking, and collaboration during the 17th Annual Scientific Meeting of Indonesian Society of Thoracic, Cardiac and Vascular Surgeons.



Shangri-La Jakarta, Kota BNI,
Jl. Jenderal Sudirman No.Kav. 1, RT.10/RW.9,
Karet Tengsin, Kec. Tanah Abang, Kota
Jakarta Pusat, Daerah Khusus Ibukota
Jakarta 10220



Scan for Google Maps



How to get there



TAXI

Use Blue Bird Taxi or Reputable apps like Grab or Gojek.



TRAIN (KRL)

Take the KRL to Sudirman Station (BNI City).

The hotel is about 4 minutes walk from the station (Exit B)



BUSS (TJ)

Take Transjakarta Corridor 1 (Blok M - Kota)

Get off at Dukuh Atas 2 stop, then walk about 5 minutes to the hotel.



CAR HIRE

Hotel car with driver available from USD 120 / 4 Hours (Mercedes E-200 CGI or Toyota Alphard).

Contact Concierge for booking.



International Speakers



Singapore

**Dr. Chang Guohao, MBBS, MRCS,
Mmed, FRCS CTh**

Consultant Cardiothoracic Surgeon in the Division of Adult Cardiac Surgery, Department of Cardiac, Thoracic and Vascular Surgery (CTVS) at the National University Heart Centre, Singapore (NUHCS).

Hongkong

**Prof. Alan D. L. Sihoe, MBBS, MA, MS,
FRACS, FRCSEd(CTh), FHKAM**

Specialist in Cardio-Thoracic Surgery
Honorary Consultant in Cardio-Thoracic Surgery,
Gleneagles Hospital Hong Kong Consultant in
Cardio-Thoracic Surgery, CUHK Medical Centre



Germany

Prof. Dr. Med. André Rüffer

since 2023 head of the workforce for surgery of congenital heart defects and pediatric cardiac surgery of the German Society for Thoracic and Cardiovascular Surgery – DGTHG.



International Speakers



Thailand

Dr. Thatchawit Urasuk

Prominent, board-certified Vascular Surgeon based in Thailand, specializing in minimally invasive endovascular treatments, peripheral artery disease (PAD), and vascular interventions.

Thailand

Prof. Dr. Punnarerk Thongcharoen, FACS

A prominent Cardiothoracic Surgeon from Thailand. He is currently affiliated with the Division of Cardiovascular Thoracic Surgery, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok.



Taiwan

Prof. Dr. Jang Ming Lee, Ph.D

Prof. Lee is the Chief and Professor of the Thoracic Surgical Division at National Taiwan University Hospital (NTUH), where he also earned his Medical Degree and PhD. As a pioneer of minimally invasive thoracic surgery in Asia, he specializes in complex procedures like esophagectomy, robotic surgery, and POEM. A former Secretary-General of the Thoracic Society (2013), Prof. Lee has published over 100 scientific papers, serves on international journal boards, and is a frequent global lecturer shaping the future of thoracic surgery.





National Speakers



Dr. dr. Dudy Arman Hanafy,
Sp.BTKV, Subsp. JD. (K), MARS,
FISA, FIATCVS



3. dr. Sugjisman Sp.BTKV,
Subsp. JD(K)



Dr. dr. Darmawan Ismail,
Sp.BTKV, Subsp. T(K)



8. dr. Harvey Romolo, Sp.BTKV,
Subsp. VE (K), B.Med.Sc



Dr. dr. Prasetyo Edl, Sp.BTKV,
Subsp. VE(K), FIATCVS, S.H, M.H,
MBA, MARS



dr. Maizul Anwar, Sp.BTKV,
Subsp. JD(K)



Dr. dr. Andreas Andri Lensen,
Sp.BTKV(K), VE, S.H, M.H,



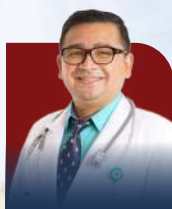
Dr. dr. Budi Rahmat, Sp.BTKV,
Subsp. JPK(K)



dr. Heston G. B. Napitupulu,
Sp.BTKV, Subsp. JD(K), MARS



dr. Marolop, Sp.BTKV,
Subsp. VE(K)



dr. Victor Jesron Nababan,
Sp.BTKV, Subsp. VE(K)



Dr. dr. Ketut Putu Yasa, Sp.B,
Sp.BTKV(K)-VE, FICS



dr. Ardiansyah, Sp.BTKV, MARS,
FICS, FIATCVS, FISQua



dr. William Makdinata, Sp.BTKV,
Subsp. VE(K), FIATCVS, FICS



dr. Dhama Shinta Susanti,
Sp.BTKV, Subsp. JPK(K)



dr. Regina Marliou, Sp.BTKV,
Subsp. JPK(K)



National Speakers



dr. Susan Hendriarini Mety,
Sp.BTKV, Subsp.T(K)



dr. Saladdin Tjokronegoro,
Sp.BTKV, Subsp.T(K)



Dr. dr. Dhihintia Jiwangga Suta
Winarno, Sp.BTKV, Subsp.T(K)



dr. Yasis Yahannee Motulo,
Sp.BTKV, Subsp.VE(K)



Dr. dr. Jayarasti
Kusumanegara, Sp.BTKV,
Subsp.JD(K), M.Kes



dr. Fuad Jindan, Sp. BTKV(K),
FECTS, FSTS



dr. Ignatius Wuryantoro, Sp.B,
Sp.BTKV, Subsp.T(K)



dr. M. Arza Putra, Sp.BTKV,
Subsp.JD(K)



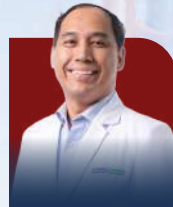
dr. David Hutagaol, Sp. BTKV,
Subsp.VE(K)



dr. I Putu Kokohana, Sp.BTKV,
Subsp.VE(K)



dr. Danang Limanto, Sp.BTKV,
Subsp.VE(K)



dr. Ivan Joalsen, Sp.BTKV,
Subsp.VE(K)



dr. Abdurrahman Hadi, Sp.BTKV



dr. Adityo Budiarmo, Sp.BTKV



Dr. dr. Pribadi Wiranda Busro,
Sp.BTKV, Subsp.JPK(K)



dr. Panji Utomo, Sp.BTKV,
Subsp.JPK(K)



National Speakers



dr. Syahrani Ibnu, Sp.BTKV(K),
Subsp.VE



dr. Oky Revianto Sediono
Pribadi, Sp.BTKV, Subsp.JD(K)



dr. Erdyanto Akbar, Sp.BTKV,
Subsp.JPK(K), M.Ked.Klin



dr. Hashfi Fauzan Raz,
Sp.BTKV(K)



dr. Bagus Herlambang,
Sp.BTKV(K), PhD.



dr. Achmad Peter Syarief,
Sp.BTKV, Subsp.T(K)



dr. Latifa Hernisa, Sp.BTKV,
Subsp.JPK(K)



dr. Tommy Dharmawan,
Sp.BTKV, Subsp.JD(K), Ph.D



dr. David Ilhami Akbar,
Sp.BTKV, FIATCVS



dr. Muhammad Aris Furqon,
Sp.BTKV



dr. Aulia Rahman, Sp.BTKV,
Subsp.JD(K)



Dr. dr. Amin Tjubandi, Sp.BTKV,
Subsp.JD(K)



dr. Sidhik Permana Putra,
Sp.BTKV



dr. Yan Effrata Sembiring,
Sp.BTKV, Subsp.VE(K)



dr. Emmy Ridhawaty
Mangunsong, MARS



Nicole Teo



Program Outline

THU
13TH
AUGUST

Workshop GP: Chest Tube Insertion, Basic Suturing & Knotting

Workshop Pediatric: Ross Procedure (Wetlab)

Workshop Adult Cardiac: MICS mitral repair (Live Cases)

Workshop Thorax: VATS (dry lab)

Workshop Vascular: Advanced Endovascular Intervention Series

FRI
14TH
AUGUST

Symposium 1: Adult Cardiac surgery

Symposium 2: Thoracic Surgery

Coffee break meeting: 1st Laser Atherectomy in Indonesia: AURYON

Opening Ceremony

Plenary Lecture

Symposium 3: Pediatric

Symposium 4: Vascular

Gala Dinner

SAT
15TH
AUGUST

Symposium 5: Vascular

Symposium 6: Pediatric

Coffee Break Meeting: Synergistic Vein Care: Combining Interventional Techniques with the Microvascular Role of MPFF

Symposium 7: Thoracic

Lunch Meeting: Rotarex Mechanical Thrombectomy in SFA and Popliteal Artery Occlusions: Managing Acute, Subacute, and Chronic Thrombotic Disease

Symposium 8: Adult

Coffee break meeting: Data in the New Era of Perfusion



Workshop

Workshop GP

Chest Tube, Basic Suturing & Knotting

 Auditorium Lt.8 Gedung A RSCM

Time	Session	Speaker	Sponsor
08.00 - 08.05	Opening		
08:05 - 08:20	Anatomi Dinding Dada	Dr. dr. Darmawan Ismail, Sp.BTKV, Subsp. T (K)	Johnson & Johnson MedTech
08:20 - 08:35	Pemasangan Chest Tube dan WSD	dr. Wuryantoro, Sp.B, Sp.BTKV, Subsp.T(K)	 PELITA BIOMEDICAL
08:35 - 08:50	BSS	dr. M. Arza Putra, Sp.BTKV, Subsp.JD (K)	 MAWAR BIOMEDIKA
08:50 - 09:00	Discussion & QnA		
09:00 - 09:30	Coffee Break		
09:30 - 12:00	Hands-on Session I: Basic Surgical Skills		
12:00 - 13:00	Lunch Break		
13:00 - 15:30	Hands-on Session II: WSD and Chest Tube Insertion		

Workshop Pediatric Cardiac

Ross Procedure (Wetlab)

 RS Jantung Harapan Kita Ged. Ventrikel Lt.5

Time	Session	Speaker / Instructor	Sponsor
08.00 - 08.30	Opening		
08:30 - 09:00	ROSS Procedure Lecture	Dr. dr. Pribadi Wiranda Busro, Sp. BTKV, Subsp. JPK(K)	Johnson & Johnson MedTech
09:00 - 12:00	Hands-on & Active Discussion	Dr. dr. Pribadi Wiranda Busro, Sp.BTKV, Subsp.JPK(K) dr. Panji Utomo, Sp.BTKV, Subsp. JPK(K) dr. Latifa Hernisa, Sp.BTKV, Subsp.JPK(K)	
12:00 - 13:00	Lunch Break		
13:00 - 13:30	Closing		



Workshop

Workshop Adult Cardiac MICS Mitral Intervention (Live Case)

 RS Jantung Harapan Kita Ged. Ventrikel Lt.4

Time	Session	Speaker	Sponsor
08.00 – 08.30	MC Open, Introduce Plenaries Speakers & Topic	dr. Elva Katharina Simamora	
08:30 – 08:45	Sambutan dari RSJPD Harapan Kita	dr. Muhadi, Sp.PD, K-KV, M.Epid, FINASIM	
08:45 – 09:00	Sambutan Kepala Departement Bedah RS Jantung & Pembuluh Darah Harapan Kita	dr. Sugisman Sp.BTKV., Sub.Sp JD(K), FIATCVS	
09:00 – 09:15	Case Introduction and Surgical Preparation	Dr. dr. Amin Tjubandi, Sp.BTKV, Subsp.JD(K)	
09:15 – 09:30	Preoperative preparation for MICS valve	dr. Yudi Hadinata, Sp.An. –KAKV	 global dispomedika Medical Corporate Devices
09:30 – 12:00	Live Case Surgery and Active Discussion	Dr. dr. Amin Tjubandi, Sp.BTKV, Subsp.JD(K)	
12:00 – 13:00	Lunch Break		
13:00 – 16:00	Live Case Surgery and Active Discussion	Dr. dr. Amin Tjubandi, Sp.BTKV, Subsp.JD(K)	
16:00 – 16:15	Closing		



Workshop

Workshop Thorax

VATS (dry lab)

 RSUP Persahabatan Ged. Griya Puspa

Time	Session	Speaker	Sponsor
08.00 - 08.15	Opening & Introduction		
08.15 - 08.45	Sponsor Product Presentation (Medtronic)		Medtronic
08.45 - 09.00	Sponsor Product Presentation (AMC)		 Advance Medical Care Corporation
09.00 - 09.30	VATS port placement and case sample video	Prof. Alan D. L. Sihoe, MBBS, MA, MS, FRACS, FRCSEd(CTh), FHKAM (Hongkong)	
09.30 - 10.00	Managing VATS bleeding (video lecture)	Prof. Dr. Punnarek Thongcharoen, FACS	
10.00 - 10.30	VATS esophagectomy video lecture	Prof. Jang Ming Lee	
10.30 - 11.00	Case presentation	dr. Saladdin Tjokronegoro, Sp.BTKV, Subsp. T(k)	
11.00 - 12.00	Hands-on & Active Discussion		
12.00 - 13.00	Lunch Break		
13.00 - 14.00	Hands-on & Active Discussion		
14.00 - 14.30	Closing & Photo Session		



Workshop

Workshop Vascular

Advanced Endovascular Intervention Series
(Recorded Case & Expert Discussion)

 RSCM PJT Ruang Rapat Lt.3

Time	Session	Speaker / Instructor	Sponsor
09:05 - 09:10	Opening		
09:10 - 09:30	Lecture DVT + Angiojet	dr. Ivan Joalsen, Sp. BTKV(K), Subsp VE, FIATCVS, MARS, McPhleb.	
09:30 - 10:00	Lecture IVUS + Stent Vena	dr. David Hutagaol, Sp.BTKV, Subsp.VE(K)	
10:00 - 10:10	QnA		 Advancing science for life™
10:10 - 10:25	Coffee Break		
10:25 - 11:25	Case Discussion Record		
11:25 - 12:25	Hands-On		
12:25 - 13:25	Lunch Break		
13:25 - 13:40	Lecture EVAR/TEVAR	Dr. dr. Danang Limanto, Sp.BTKV, Subsp. VE(K)	
13:40 - 13:50	QnA		
13:50 - 14:50	Case Discussion Record		
14:50 - 15:50	Hands-On		
15:50 - 16:05	Coffee Break		
16:05 - 16:20	Lecture EVLA	dr. Sidhik Permana Putra, Sp.BTKV	
16:20 - 16:30	QnA		 NDOMED
16:30 - 17:30	Live Case Discussion		
17:30 - 17:40	Closing		



Symposium Day 1

Symposium 1 : Adult Cardiac Surgery



Moderator

**dr. Bimo Kusumo, Sp.BTKV,
Subsp.JD(K)**

Sponsored by:

MEDSTIM

Time	Session	Speaker
07:35 – 07:50	Bridging Life: LVAD to Heart Transplantation	 Dr. dr. Dudy Arman Hanafy, Sp.BTKV, Subsp.JD(K), MARS, FISA, FIATCVS
07:50 – 08:05	Interventricular Septal Rupture in Acute Myocardial Infarction: Challenges and Strategies	 dr. Sugisman, Sp.BTKV, Subsp.JD(K)
08:05 – 08:20	Empowering Precision in CABG: Leveraging TTFM and Imaging for Better Decisions and Outcomes	 Dr. Chang Guohao, MBBS. MRCS. Mmed. FRCS CTh
08:20 – 08:30	Discussion & QnA	

Symposium 2 : Thoracic Surgery



Moderator 1

**dr. Achmad Peter Syarif,
Sp.BTKV, Subsp.T(K)**

Time	Session	Speaker
08:30 – 08:45	IDRG-Based Hospital Health Service Financing	dr. Emmy Ridhawaty Mangunsong, MARS
08:50 – 09:05	Current Guideline Update for Lung Cancer Surgery	 Prof. Alan D. L. Sihoe, MBBS, MA, MS, FRACS, FRCSEd(CTh), FHKAM
09:05 – 09:20	Perioperative systemic therapy for lung cancer, what surgeons need to know	 Prof. Dr. Punnarerk Thongcharoen, FACS
09:20 – 09:35	The Role of Cryosurgery Compared with Conventional Surgery in Lung Cancer	 Dr. dr. Darmawan Ismail, Sp.BTKV, Subsp. T(K)
09:35 – 09:50	The Evolving Technique of NIVATS and robotic surgery in Lung Surgery	 dr. Harvey Romolo, Sp.BTKV, Subsp.VE (K), B.Med.Sc



Symposium Day 1

Coffee Break Meeting

Sponsored
by:



Time	Session	Speaker
09:50 - 10:20	Auryon Laser Artherectomy	 Dr. Thatchawit Urasuk
	1st Laser Artherectomy in Indonesia: AURYON	 dr. Faizunnur Erfin, Sp.BTKV, Subsp.VE(k)

Opening Ceremony

Time	Session	
10:20 - 10:22	Opening by MC	
10:22 - 10:28	Indonesia Raya, MARS HBTkVI & Opening Video Act	
10:28 - 10:30	Opening Prayer <i>Dr. dr. Muhammad Riendra, Sp.BTKV, Subsp.VE(k), FIATCVS</i>	
10:30 - 10:40	Speech by Chairman of the Organizing Committee PIT HBTkVI XVII 2026: <i>dr. Heston G. B. Napitupulu, Sp. BTKV</i>	
10:40 - 10:50	Speech by: Chairman of the Indonesian Association of Thoracic, Cardiac, and Vascular Surgeon (IATCVS) <i>Dr. dr. Prasetyo Edi, Sp.BTKV, Subsp.VE(k), FIATCVS, S.H., M.H., MBA, MARS</i>	
10:50 - 11:20	Keynote Speech by : The Minister of Health of the Republic of Indonesia or their representative. <i>Budi Gunadi Sadikin</i>	
11:20 - 11:21	MC Closing for Plenary and Introducing Friday Prayers	
11:21 - 13:41	Friday Prayer & Lunch	
13:40 - 13:50	The Evolution of Minimal Invasive Surgery <i>Dr. dr. Dudy A. Hanafy, Sp.BTKV(k), MARS</i>	 
13:50 - 14:00	CrownJun Asflex Suture <i>Merlyn Galliguez</i>	 PT. CROWN JUNE SURGICAL



Symposium Day 1

Plenary Lecture



Moderator

**dr. Heston Napitupulu SpBTKV,
SubSp JD (K), MARS**

Time	Session	Speaker
14:05 - 14:20	The Present and Future of Thoracic, Cardiac, and Vascular Surgery in Indonesia	 dr. Maizul Anwar, Sp.BTKV, Subsp.JD(K)
14:20 - 14:35	Ethical Standards and Issues in Cardiothoracic and Vascular Surgeons facing Global Health Initiatives	 Brigjen TNI (Pur) Dr. dr. Andreas Andri Lensoen, Sp.BTKV(K) VE, SH, MH,
14:35 - 14:50	Competency & Profession Standard Update	 dr. Ketut Putu Yasa, Sp.BTKV, Subsp.VE(K)

Symposium 3 : Pediatric



Moderator

**dr. Navy Laksmono, Sp.BTKV,
Subsp.JPK(K)**

Time	Session	Speaker
15:05 - 15:20	Minimal Invasive Cardiac Surgery in Pediatric settings. Where are we now?	 Dr. dr. Budi Rahmat, Sp.BTKV, Subsp.JPK(K)
15:20 - 15:35	Optimizing surgical outcomes of late presenter TOF	 dr. Erdyanto Akbar, SpBTKV, Subsp.JPK (K)
15:35 - 15:50	How to start Pediatric Cardiac Service in secluded regions	 dr. Ardiansyah, Sp.BTKV, MARS, FICS, FIATCVS, FISQua
15:50 - 16:00	Discussion & QnA	



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Symposium Day 1

Symposium 4 : Vascular



Moderator

dr. I Putu Kokohana Arisutawan,
Sp.BTKV, Subsp.VE(k)

Time	Session	Speaker
16:05 - 16:20	BTK Intervention Simplified: Maximizing Results with POBA	 dr. Marolop, Sp. BTKV, Subsp.VE(k)
16:20 - 16:35	Bypass vs Endovascular: Where Do We Stand in Peripheral Arterial Disease?	 dr. Victor Jesron Nababan, Sp.BTKV, Subsp.VE(k)
16:35 - 16:50	Mastering In Situ Bypass in CLI: From Vein Mapping to Distal Targeting	 Dr. dr. Ketut Putu Yasa, Sp.B, Sp.BTKV(k)-VE, FICS
16:50 - 17:00	Discussion & QnA	



Symposium Day 2

Symposium 5 : Vascular



Moderator

**dr. Ivan Joalsen, Sp.BTKV(k), Subsp.VE,
FIATCVS, MARS, McPhleb.**

Time	Session	Speaker
09:15 – 09:30	Open Repair of Abdominal Aortic Aneurysm in the Era of Challenges and Sustainability	 dr. Bagus Herlambang, Sp.BTKV(k), PhD.
09:30 – 09:45	Optimizing outcomes in AV Shunt Failure: When to Go Endo, When to Go Open?	 dr. Setiadi Drajad Kurniawan, Sp.BTKV(k), Subsp.VE
09:45 – 10:00	State of art management of non thrombotic iliac vein lesion (NIVL): IVUS Guided Paradigm	 dr. William Makdinata, Sp.BTKV, Subsp.VE(k), FIATCVS, FICS
10:00 – 10:10	Discussion & QnA	

Symposium 6 : Pediatric



Moderator

**dr. Michael Caesario, Sp.BTKV,
Subsp.JPK(k)**

Time	Session	Speaker
10:15 – 10:30	Aortic Arch Surgery in Children: With Heart and Mind and Without Patch	 Prof. Dr. André Rüffer
10:30 – 10:45	No Longer Bound : Surgical Solution for Vascular Rings	 dr. Dhama Shinta Susanti, Sp.BTKV, Subsp.JPK(k)
10:45 – 11:00	Valve surgery in pediatric. What modality that we have?	 dr. Regina Marilau, Sp.BTKV, Subsp.JPK(k)
11:00 – 11:10	Discussion & QnA	



Symposium Day 2

Coffee Break Meeting



Moderator

dr. Royman Simanjuntak, Sp.BTKV(K)

Sponsored
by:

SERVIER

Time	Session	Speaker
11:10 - 11:40	Synergistic Vein Care: Combining Interventional Techniques with the Microvascular Role of MPFF	 dr. Tommy Dharmawan, Sp.BTKV, Subsp.JD(K), Ph.D

Symposium 7 : Thoracic



Moderator

dr. Achmad Peter Syarif, Sp.BTKV, Subsp.T(K)

Time	Session	Speaker
11:45 - 12:00	Tuberculosis: mother of thoracic surgery then and now, past and prospect role of surgery	 dr. Susan Hendriarini Mety, Sp.BTKV, Subsp.T(K)
12:00 - 12:15	Tips and Trick for Pulmonary Resection in Aspergilosis	 dr. Saladdin Tjokronegoro, Sp.BTKV, Subsp.T(K)
12:15 - 13:30	A simple yet sometimes so complicated: empyema surgery	 Dr. dr. Dhihintia Jiwangga Suta Winarno, Sp.BTKV, Subsp.T(K)
12:30 - 12:40	Discussion & QnA	

Lunch Symposium



Moderator

dr. Franky Yesaya Siahaan, Sp.BTKV, Subsp.VE(K)

Time	Session	Speaker	Sponsor
12:40 - 13:10	Rotarex Mechanical Thrombectomy in SFA and Popliteal Artery Occlusions: Managing Acute, Subacute, and Chronic Thrombotic Disease	 dr. Yosis Yohannes Motulu, Sp.BTKV, Subsp.VE(K)	



Symposium Day 2

Lunch Meeting:

Extending Post Operative Pain Management : A New Era of 72 hour Pain Control with Hydrogel-based Drug Delivery (WELPASS)



Moderator

**Dr. dr. Prasetyo Edi, Sp.BTKV, Subsp.VE(K),
FIATCVS, S.H., M.H., MBA.MARS**

Time	Session	Speaker	Sponsor
13:10 - 13:40	Management of Acute Postoperative Pain in Thoracic & Cardiovascular Surgeries: The Role of Hydrogel-based Drug Delivery Kit*	 dr. Yan Effrata Sembiring, Sp.BTKV, Subsp.VE(K)	 PYRIDAM TAKUMA member of PVTA

Coffee Break Meeting

Time	Session	Speaker
13:40 - 13:55	Data in the New Era of Perfusion	Nicole Teo 

Symposium 8 : Adult



Moderator

**Dr. dr. Umar Usman M.KedKlin. Sp.BTKV
(K), Subsp. T (K), FIATCVS**

Time	Session	Speaker
14:00 - 14:15	Update on Aortic Root Enlargement: Prevention of Prosthetic Patient Mismatch	 dr. Oky Revianto Sediono Pribadi, Sp.BTKV, Subsp.JD(K)
14:15 - 14:30	How to set up MICS	 Dr. dr. Jayarasti Kusumanegara, Sp.BTKV, Subsp.JD (K), M.Kes
14:30 - 14:45	How to set up minimal invasive cardiac surgery in private hospital	 dr. Fuad Jindan, Sp.BTKV(K), FECTS, FSTS
14:45 - 14:55	Discussion & QnA	



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ABSTRACT





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Early outcomes of modified Del Nido cardioplegia in complex congenital heart disease: A single-center experience in Cipto Mangunkusumo National Hospital

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Background/Introduction: Del Nido cardioplegia is a hyperkalemic extracellular cardioplegic solution developed to improve myocardial protection by limiting calcium-mediated myocardial injury. Many centers use Plasma-Lyte A, which contains no calcium as the crystalloid base; however, this main base solution is not available in Indonesia. Lactated ringer solution contains a small amount of calcium but can be safely used to replace Plasma-Lyte A.

Objectives: To report early results of modified Del Nido cardioplegia using lactated ringer solution in complex congenital heart disease with RACHS-I score >3.

Method: We conducted a retrospective observational study of all pediatric patients with complex congenital heart disease who underwent surgery from January 2025 to June 2026 using modified Del Nido cardioplegia in Cipto Mangunkusumo National Hospital. Patient demographics, operative characteristics, and early postoperative outcomes, including mortality, vasoactive-inotropic score (VIS) at ICU admission, mechanical ventilation duration, ICU length of stay, and hospital length of stay, were analyzed.

Result: A total of 154 subjects were included in this study, 51.9% were female. The mean age was 3.6±3.9 years. The duration of cardiopulmonary bypass time and aortic cross

clamp time were 99.4±45 minutes and 64.2±32.5 minutes. The total number of cardioplegia given was 1.2±0.5 times. There was 34 cases of mortality (22.1%). Ventricular tachycardia or fibrillation (VT/VF) after removal of aortic cross clamp occurred in 5 patients (3.2%). The VIS at ICU admission was 14.4±13.3. The duration of ventilator time was 75.7±93.9 hours. The ICU and hospital length of stay were 5.8±6.9 and 14.1±12.9 days.

Conclusion: Our early single-center experience suggests that modified Del Nido cardioplegia is a feasible myocardial protection strategy for complex congenital heart surgery, providing prolonged myocardial arrest with minimal redosing and a low incidence of reperfusion ventricular arrhythmias. Further comparative studies are needed to determine whether it offers advantages over conventional cardioplegia.

Keywords: Del Nido, cardioplegia, complex congenital heart disease, early outcomes

Primary Repair versus Staged Pulmonary Artery Banding Strategy in Complete Atrioventricular Septal Defect: A Systematic Review and Meta-Analysis of Early and Long-Term Outcomes

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Background/Introduction: Complete atrioventricular septal defect (CAVSD) is a complex congenital heart disease requiring surgical correction during infancy. The optimal surgical strategy remains controversial, particularly regarding primary complete repair versus staged pulmonary artery banding (PAB). This study aimed to compare early and long-term outcomes between these

Objectives: To compare the early and long-term clinical outcomes of primary complete repair versus staged pulmonary artery banding (PAB) followed by delayed repair in pediatric patients with complete atrioventricular septal defect (CAVSD) through a systematic review and meta-analysis.

Method: A systematic review and meta-analysis was conducted according to PRISMA 2020 guidelines. PubMed, Scopus, Embase, Cochrane Library, and Web of Science were searched for comparative studies published between



January 2020 and May 2026. Outcomes included early mortality, long-term survival, intensive care unit (ICU) length of stay, reoperation, atrioventricular valve regurgitation (AVVR), and pulmonary hypertension.

Result: Twelve retrospective cohort studies involving 2,438 patients were included. Of these, 1,564 underwent primary repair and 874 underwent staged PAB. Primary repair was associated with significantly lower early postoperative mortality (RR 0.39, 95% CI 0.25–0.61) and superior long-term survival (OR 2.42, 95% CI 1.73–3.37). In addition, primary repair was associated with shorter ICU stay and lower reoperation rates. No significant difference was observed in postoperative AVVR. A trend toward lower pulmonary hypertension favored primary repair.

Conclusion: Primary repair was associated with superior early and long-term outcomes compared with staged PAB in patients with CAVSD. These findings support the use of primary repair as the preferred surgical strategy for most patients when clinically feasible.

Keywords: Complete atrioventricular septal defect; CAVSD; pulmonary artery banding; congenital heart disease

Intraoperative Perfusion Burden and Postoperative Organ Injury After Adult Aortic Surgery: Nonlinear and Complexity-Adjusted Associations

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Background/Introduction: Cardiopulmonary bypass (CPB) duration is often treated as a generic marker of operative complexity, but adult aortic surgery exposes patients to distinct intraoperative perfusion burdens with different organ-specific consequences.

Objectives: To evaluate whether total perfusion burden, myocardial ischemic burden, and non-clamped systemic perfusion burden are nonlinearly associated with postoperative organ injury after adult aortic surgery.

Method: We conducted a retrospective cohort study of 163 adults undergoing aortic surgery from 2017 to 2025. The primary exposure was CPB time; secondary exposures were

aortic cross-clamp (AoX) time and CPB-minus-AoX time. The primary endpoint was major postoperative organ injury or death. CPB time was modeled using restricted cubic spline logistic regression and per 30-minute increments, adjusted for baseline risk and operative complexity. Secondary analyses evaluated organ-specific outcomes, complexity-residual CPB burden, and transfusion attenuation.

Galectin-3 as an Independent Predictor of Postoperative Atrial Fibrillation and Survival After Cardiac Surgery

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1 Umpalembang

Background/Introduction: Postoperative atrial fibrillation is one of the most frequent complications following cardiac surgery and is associated with prolonged hospitalization, thromboembolic events, and unfavorable long-term outcomes. Cardiac fibrosis and inflammatory remodeling are considered important mechanisms underlying atrial fibrillation development. Galectin-3, a biomarker associated with fibrotic processes, may reflect the presence of an arrhythmogenic substrate before surgery.

Objectives: This article review aimed to evaluate the role of preoperative plasma galectin-3 levels as a predictor of postoperative atrial fibrillation and long-term survival outcomes in patients undergoing elective cardiac surgery, and to assess its potential clinical application for riskstratification.

Method: The reviewed study was a prospective observational cohort study conducted at the Medical University of Vienna, Austria. A total of 475 adult patients undergoing elective coronary artery bypass graft surgery and/or valve surgery were included. Plasma galectin-3 concentrations were measured before surgery using an enzyme-linked immunosorbent assay. Logistic regression analysis was applied to evaluate predictors of postoperative atrial fibrillation, while Cox regression analysis was used to assess associations with all-cause mortality. Classification and regression tree analysis was performed to determine galectin-3 risk categories.

Segmentectomy versus Lobectomy for Early-Stage Non-Small Cell Lung Cancer: An Updated Systematic Review and Meta-analysis Following the JCOG0802 and CALGB 140503 Trials

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Background/Introduction: Lobectomy has long been the standard surgical treatment for early-stage non-small cell lung cancer (NSCLC). However, the landmark JCOG0802 and CALGB 140503 trials have renewed interest in anatomical segmentectomy. Subsequent observational studies have reported inconsistent findings, highlighting the need for an updated synthesis of the available evidence.

Objectives: To compare survival and recurrence outcomes between segmentectomy and lobectomy in patients with early-stage NSCLC using an updated systematic review and meta-analysis.

Method: A systematic review and meta-analysis was conducted according to the PRISMA statement. PubMed and the Cochrane Library were systematically searched for comparative studies evaluating segmentectomy versus lobectomy. Ten studies (three randomized controlled trials and seven retrospective cohort studies) involving 29,017 patients were included. Hazard ratios (HRs) were pooled for time-to-event outcomes and risk ratios (RRs) for dichotomous outcomes using a random-effects model in Review Manager 5.4. Outcomes included overall survival (OS), recurrence-free survival (RFS), 5-year OS, and local/locoregional recurrence.

Result: Five studies contributed to the pooled HR analysis of OS. Compared with lobectomy, segmentectomy was associated with a significantly lower hazard of overall mortality (HR 0.77, 95% CI 0.61–0.97; $P=0.03$; $I^2=0\%$). No significant differences were observed in RFS (HR 0.96, 95% CI 0.74–1.24; $P=0.77$; $I^2=0\%$), 5-year OS (RR 0.99, 95% CI 0.94–1.03; $P=0.53$; $I^2=79\%$), or local/locoregional recurrence (RR 0.76, 95% CI 0.38–1.53; $P=0.44$; $I^2=0\%$).

Conclusion: Segmentectomy achieved survival and recurrence outcomes comparable to lobectomy. Although pooled time-to-event analysis demonstrated a lower hazard of overall mortality, this finding was based on only five studies reporting HR data. Taken together, the available

evidence suggests that segmentectomy is a reasonable parenchymal-sparing surgical option for appropriately selected patients with early-stage NSCLC.

Keywords: Non-small cell lung cancer; Segmentectomy; Lobectomy; Systematic review; Meta-analysis.

Comparison of Machine Learning Methods: Graph-Based Versus Voxel-Based Segmentation of Total Cavopulmonary Connection in Fontan Patients

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Background/Introduction: Mortality rates among Fontan patients remain high despite advancements in management. Patient-specific Total Cavopulmonary Connection (TCPC) models could enhance understanding of the complex physiology of Fontan patients through computational simulation, aiding personalized treatment. However, manual segmentation for TCPC model reconstruction is labor-intensive, hampering numerous pipeline research. Automated segmentation using deep-learning (DL, particularly graph-based methods like Image2Mesh), may solve this problem and overcome the limitations of voxel-based segmentation such as 3D UNet, which offer struggle with highly heterogeneous structure like TCPC.

Objectives: The overall aim of the study was to compare the performance of voxel-based segmentation '3D UNet' and graph-based segmentation 'Image2Mesh' in segmenting and generating patient-specific TCPC model

Method: A total of 235 cardiac magnetic resonance (CMR) datasets from adult and pediatric TCPC were manually segmented to establish ground truth. Of these, 160 samples were randomly allocated to train two DL-based segmentation methods, 3D UNet and Image2Mesh, with 25 samples reserved for validation and 50 for testing. The segmentation accuracy of both methods was evaluated using four different metrics. Additionally, the centerline diameter measurements obtained from Image2Mesh were compared with ground truth to assess the bias and agreement.

Targeted Therapy or Chemotherapy First? A Meta-Analysis in Resectable Egfr-Mutant Non-Small Cell Lung Cancer

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Background/Introduction: Resectable epidermal growth factor receptor (EGFR) mutated non-small cell lung cancer (NSCLC) remains at high risk of recurrence despite curative-intent surgery. Perioperative EGFR tyrosine kinase inhibitors (EGFR-TKIs) and platinum-based chemotherapy are treatment options for resectable NSCLC. However, their comparative efficacy across adjuvant and neoadjuvant settings remains unclear.

Objectives: This meta-analysis compared the efficacy and safety of EGFR-TKIs versus chemotherapy in adjuvant and neoadjuvant settings.

Method: A systematic search following PRISMA guidelines of PubMed, ScienceDirect, Wiley, and Cochrane was performed up to May 2026. This review was prospectively enrolled in the International Prospective Register of Systematic Reviews (PROSPERO CRD420261436884). Eligible studies included randomized and comparative studies evaluating perioperative EGFR-TKIs versus chemotherapy in resectable EGFR-mutated NSCLC. Pooled data used a random-effects or fixed effect model depending on heterogeneity. Primary outcomes were overall survival (OS) and disease-free survival (DFS). Secondary outcomes included grade 3/4 adverse events, relapse/recurrence, major pathologic response (MPR), pathologic complete response (pCR), R0 resection, and lymph node (LN) downstaging.

Cell-Derived Therapies for Hypoplastic Left Heart Syndrome: A Meta-Analysis

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Background/Introduction: Hypoplastic left heart syndrome (HLHS) compels the right ventricle to sustain systemic circulation, a maladaptive physiology that predisposes to progressive dysfunction despite staged palliation. Regenerative cell-based therapies are emerging as an additional surgical treatment modality. Objectives: explore existing evidence on the implementation of cell-based therapeutic strategies in HLHS.

Objectives: MethodA systematic search of PubMed, ScienceDirect, Cochrane, and Wiley databases was performed through January 2026. Eligible studies evaluated BM-derived cell therapy in HLHS. Pooled analyses applied fixed- or random-effects models according to heterogeneity. Safety outcomes were prioritized. Secondary endpoints included right ventricular ejection fraction (RVEF), weight-for-age z-score, cardiopulmonary bypass (CPB) time, and length of hospital stay (LoS).

Preoperative SglT2 Inhibition Reduces Acute Kidney Injury Incidence And All-Cause Mortality In Cardiac Surgery Patients: A Meta Analysis

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Background/Introduction: The incidence of cardiac surgery-associated acute kidney injury (CSA-AKI) is reported to be as high as 40%, a complication strongly correlated to increased mortality rates and worse clinical outcomes. This meta-analysis systematically evaluated the clinical utility of SGLT2 inhibition in cardiac surgery patients.

Method: Randomized controlled trials (RCT) and propensity score-matched observational studies evaluating preoperative SGLT2 inhibitors administration in open heart surgery were obtained through comprehensive literature search of PubMed, Scopus, Cochrane Library, and Europe PMC. The primary endpoint was postoperative acute kidney injury (AKI), while the secondary endpoint comprised all-caused mortality. Pooled mean differences (MD) and risk ratios (RR) with 95% confidence intervals (CI) were estimated utilizing a random effects model.

Can Artificial Intelligence Foresee Postoperative Acute Respiratory Distress Syndrome?: A Systematic Review and Meta-Analysis of Machine Learning Models After Cardiac Surgery

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Background/introduction: Acute respiratory distress syndrome (ARDS) is a serious complication after cardiac surgery, associated with increased morbidity and mortality. Machine learning (ML) models have increasingly been developed to predict postoperative complications, but their performance in predicting ARDS has not been systematically evaluated.

Objectives: To evaluate the diagnostic performance of ML-based models for predicting ARDS following cardiac surgery.

Method: A comprehensive literature search identified observational studies developing or validating ML for ARDS prediction after cardiac surgery. Random-effects meta-analysis was performed on logit-transformed area under the receiver operating characteristic curve (AUROC) estimates. Subgroup analyses were conducted according to algorithm family including boosting-based models, tree-based ensemble methods, traditional statistical models, and other ML approaches, and leave-one-out sensitivity analyses were performed.

Result: Of 16 identified studies, 5 met the inclusion criteria and were included in the quantitative synthesis. The pooled AUROC of the best-performing model from each study was 0.816 (95% CI, 0.771–0.853), indicating good discriminative performance. Significant heterogeneity was observed ($I^2 = 68.0\%$). Sensitivity analysis identified one study as the source of heterogeneity; its exclusion increased the pooled AUROC to 0.838 (95% CI, 0.823–0.852) and eliminated heterogeneity ($I^2 = 0\%$). Subgroup analysis demonstrated significant differences by algorithm family (QM = 14.74, $p = 0.002$). Boosting-based models achieved the highest pooled AUROC (0.802, 95% CI, 0.777–0.825), followed by tree-based ensemble methods (0.798, 95% CI, 0.759–0.832), traditional statistical models (0.757, 95% CI, 0.707–0.800), and other ML approaches (0.647, 95% CI, 0.569–0.717).

Conclusion: ML models demonstrate good performance for predicting ARDS after cardiac surgery. Boosting-based and

tree-based ensemble algorithms achieved the highest discriminative accuracy compared to traditional statistical models, however externally validated studies are needed.

Keywords: machine learning; acute respiratory distress syndrome; cardiac surgery; prediction model; artificial intelligence

Lateral Thoracic Expansion for Infantile Jeune Syndrome: A Rare Case Report

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Background: Jeune syndrome is a rare skeletal ciliopathy associated with thoracic insufficiency and respiratory failure. We report an infant with severe Jeune syndrome who underwent lateral thoracic expansion (LTE) for progressive respiratory compromise.

Case Illustration/Description: A 6-month-old girl with genetically confirmed Jeune syndrome (DYNC2H1 pathogenic variant) presented with progressive respiratory failure requiring mechanical ventilation. She had a history of neonatal respiratory distress, recurrent respiratory infections, poor weight gain, developmental delay, and chronic ventilator dependence. Clinical and radiographic evaluation demonstrated severe thoracic dysplasia with a markedly narrow bell-shaped thorax. Because of persistent ventilator dependence despite maximal supportive therapy, bilateral LTE was performed using staggered rib division and reconstruction plate fixation. Postoperative radiographs demonstrated successful thoracic expansion with increased transverse thoracic dimensions. However, the patient remained ventilator-dependent and developed progressive respiratory deterioration, ultimately dying from respiratory failure three months after surgery. Jeune syndrome-associated thoracic insufficiency is a major determinant of morbidity and mortality because severe thoracic restriction impairs lung growth and ventilation. LTE

aims to increase thoracic volume and improve respiratory function, although reported outcomes remain variable. In the present case, postoperative imaging confirmed satisfactory thoracic enlargement following bilateral LTE. However, persistent ventilator dependence and progressive respiratory deterioration suggested that successful mechanical expansion alone may not ensure meaningful physiologic recovery. Advanced pulmonary compromise and longstanding thoracic insufficiency before intervention likely contributed to the poor outcome.

Conclusion: Despite successful thoracic expansion, meaningful respiratory recovery was not achieved. Advanced thoracic insufficiency and prolonged ventilator dependence may limit the benefit of LTE in severe infantile Jeune syndrome.

Keywords: Jeune syndrome; Lateral thoracic expansion; Ventilator dependence; Infant; Restrictive thoracic dysplasia

Revisiting Prophylactic Intra-Aortic Balloon Pump in Coronary Artery Bypass Grafting: Who Truly Benefits? A Systematic Review and Meta-Analysis

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Background/Introduction: Coronary artery bypass grafting (CABG) remains the standard revascularization strategy for patients with complex coronary artery disease and impaired left ventricular function. Despite advances in surgical techniques and perioperative management, patients undergoing CABG remain at increased risk of perioperative hemodynamic instability, low cardiac output syndrome (LCOS), myocardial ischemia, and postoperative mortality. Prophylactic intra-aortic balloon pump (IABP) use in CABG remains controversial.

Objectives: We performed a meta-analysis to evaluate whether perioperative IABP improves postoperative outcomes and whether its effect differs by surgical strategy.

Surviving Major Sternotomy Amidst Critical Anemia: Successful Extended Thymectomy for Thymoma-Associated Pure Red Cell Aplasia and Myasthenia Gravis

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Background: Managing concurrent pure red cell aplasia (PRCA) and myasthenia gravis (MG) in elderly patients undergoing major thoracic surgery poses severe perioperative challenges.

Case Illustration/Description: A 64-year-old male presented with transfusion-dependent refractory anemia (hemoglobin nadir 4.0 g/dL). Bone marrow puncture confirmed PRCA and excluded B-cell chronic lymphoproliferative disorder (BCLPD), prompting a PET-CT that revealed an anterior-superior mediastinal mass. Screening also identified subclinical MG. Preoperative optimization included oral pyridostigmine and one session of plasmapheresis. Despite a critical preoperative hemoglobin of 6.8 g/dL, definitive median sternotomy and extended thymectomy were performed to halt chronic transfusion dependency. Intraoperative blood loss was minimal, and histopathology confirmed a Masaoka Stage I, WHO Type AB thymoma. Postoperatively, hemoglobin stabilized at 9.8 g/dL without neurological or hematological complications. The coexistence of thymoma, pure red cell aplasia (PRCA), and myasthenia gravis (MG) stems from tumor-driven immune dysregulation. The primary clinical dilemma involved surgical timing amid profound anemia (hemoglobin 6.3 g/dL). Delaying thymectomy to reach conventional hemoglobin targets was deemed futile; because the tumor completely suppressed erythropoiesis, transfusion dependency would only invite cumulative risks like iron overload. Consequently, immediate tumor resection was prioritized as the definitive mechanism to restore bone marrow function. Preoperative pyridostigmine and plasmapheresis mitigated the risk of a myasthenic crisis, while an extended thymectomy eradicated all autoantibody-producing niches. The successful postoperative hemoglobin stabilization validates this decisive multidisciplinary strategy.



Conclusion: A coordinated multidisciplinary approach, thorough preoperative optimization involving immunomodulation, and precise, blood-conserving surgery are vital for successful outcomes in thymoma-associated PRCA with severe anemia.

Keywords: Pure Red Cell Aplasia, Type AB Thymoma, Extended Thymectomy, Plasmapheresis, Perioperative Management

When a HFrEF Threatens a Limb: Limb Salvage with Early Heparinization in Acute Limb Ischemia Secondary to Left Ventricular Thromboembolism

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1. RSU 'Aisyiyah Ponorogo

Background: Severely reduced ejection fraction predisposes to left ventricular (LV) thrombus formation and systemic embolization. Acute limb ischemia (ALI) is a rare but limb-threatening complication requiring immediate recognition and treatment to prevent irreversible tissue loss. We report a dramatic case of ALI secondary to LV thromboembolism in a young patient with acute decompensated heart failure (ADHF) and profoundly reduced ejection fraction, successfully reversed with early anticoagulation alone.

Case Illustration/Description: A 34-year-old man presented with progressive dyspnea, orthopnea, and systemic congestion. Transthoracic echocardiography revealed severe global hypokinesia, multiple LV thrombi, and an ejection fraction of 14.3%. He deteriorated into cardiogenic shock requiring inotropic support. On hospital day six, he abruptly developed right lower limb pain, pallor, paresthesia, weakness, and absent pulses. Duplex ultrasonography confirmed ALI due to distal arterial occlusion from LV thromboembolism. Immediate intravenous unfractionated heparin was administered alongside standard heart failure therapy, resulting in rapid symptom reversal and restoration of distal flow on repeat imaging, without the need for surgical or endovascular intervention. This case illustrates a fulminant thromboembolic cascade driven by severe ventricular dysfunction, where profound stasis and chamber dilatation generated multiple LV thrombi with systemic embolic

potential. While cerebral embolism is more commonly described, peripheral arterial occlusion causing ALI is equally devastating yet potentially reversible. Notably, rapid limb salvage was achieved

Conclusion: Extremely reduced ejection fraction carries high thromboembolic risk. Early recognition and immediate anticoagulation may be limb-saving in acute limb ischemia secondary to LV thromboembolism, even in critically ill patients with cardiogenic shock.

Keywords: acute limb ischemia; severe heart failure; dilated cardiomyopathy; systemic embolism; anticoagulation

In Vivo Evaluation of 3D Bioprinted Implants for Cardiac Regeneration: A Systematized Review

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Background/introduction: Myocardial infarction possibly causes irreversible cardiac tissue injury. Over the past decades, 3D bioprinting has emerged as a potential solution due to its precision and customisability compared to conventional tissue engineering. Thus, this review aims to explore the in vivo evaluation of 3d bioprinted constructs in cardiac tissue regeneration.

Method: This review followed the PRISMA guideline and PICO framework. This review included histological, fluorescence, gene expression, and cardiac function analyses of animals with 3D-bioprinted cardiac implants, compared to a sham group or disease model group. Studies investigating applications other than cardiac regeneration (e.g. aortic/valvular grafts) were excluded. A search was conducted in the PubMed and ScienceDirect databases using "cardiac" AND "3D Bioprinting" keywords. The last search was performed on 10 June 2026. SYRCL was used to assess the risk of bias. Finally, the results were summarised in a table.

Result: Twelve studies were included. Most studies utilised commercial 3D bioprinters, customised GelMA-based bioink, and a multilayer perpendicular pattern to fabricate the implants. Cardiac implantation in rodent MI models was mostly performed. Human-induced pluripotent stem cells were the most common cell source. Overall, histological,



fluorescence, gene expression, and echocardiographic analyses demonstrated improvements in cardiac function, reduced infarction area, and increased cardiomyocyte and endothelial cell numbers in models treated with 3D-bioprinted cell-seeded scaffolds. However, no study assessed the long-term effects and degradation of the implants.

Conclusion: 3D-bioprinted cell-seeded scaffolds have the potential to regenerate cardiac tissue and improve, although they require long-term effects and degradation observation, especially in large animals, prior to clinical trials.

Keywords: 3D bioprinting; cardiac; regeneration; in vivo; review

Surgeon Learning Curves and Proficiency Thresholds in Minimally Invasive Coronary Artery Bypass Surgery: A Systematic Review and Meta-analysis

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Background/introduction: Minimally invasive coronary artery bypass surgery (MICABS), including minimally invasive direct coronary artery bypass (MIDCAB), robotic-assisted coronary artery bypass grafting (RA-CABG), and totally endoscopic coronary artery bypass (TECAB), offers potential benefits over conventional sternotomy. However, its adoption remains limited by a substantial learning curve, and the impact of surgeon experience on clinical outcomes remains unclear.

Method: A systematic review and meta-analysis was conducted using PubMed, Scopus, and Embase. Studies evaluating learning curves in adult patients undergoing MICABS and comparing outcomes between learning and proficiency phases were included. Random-effects meta-analyses were performed for mortality, conversion to sternotomy, procedure time, and hospital length of stay (LOS).

Pulsatile Versus Non-Pulsatile Flow During Cardiopulmonary Bypass in Adult Cardiac Surgery: A Systematic Review and Meta-Analysis of Clinical and Perfusion Outcomes (2010–2026)

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Background/introduction: Pulsatile cardiopulmonary bypass (CPB) has been proposed to improve tissue perfusion compared with conventional non-pulsatile flow. However, its clinical benefits remain controversial in modern adult cardiac surgery. This systematic review and meta-analysis evaluates the impact of pulsatile versus non-pulsatile CPB on major postoperative outcomes.

Objectives: This study aims to compare the effects of pulsatile and non-pulsatile cardiopulmonary bypass on clinical outcomes and perfusion-related parameters in adult cardiac surgery through a systematic review and meta-analysis of randomized and observational studies published between 2010 and 2026.

Method: A systematic search was conducted across multiple databases for studies published between 2010 and 2026. Eligible studies included randomized and observational comparative designs involving adult patients undergoing CPB. Outcomes assessed included mortality, neurological complications, acute kidney injury, ICU and hospital length of stay, mechanical ventilation duration, and postoperative lactate levels. Random-effects meta-analysis was performed, with subgroup analyses based on pump type.

Result: Sixteen studies involving thousands of adult cardiac surgery patients were included. There was no significant



difference between pulsatile and non-pulsatile CPB in all-cause mortality (RR 1.00, 95% CI 0.61–1.62), atrial fibrillation, neurological complications, or acute kidney injury. ICU length of stay showed a modest reduction with pulsatile flow (MD $\pm$ 0.22 days; 95% CI $\pm$ 0.34 to $\pm$ 0.11), while hospital stay and mechanical ventilation duration were not significantly different. Postoperative lactate levels were significantly lower in the pulsatile group (MD $\pm$ 0.68 mmol/L; 95% CI $\pm$ 0.99 to $\pm$ 0.37), although with moderate heterogeneity.

Conclusion: Pulsatile CPB is associated with improved surrogate perfusion markers, particularly reduced lactate levels, but does not translate into significant improvements in major clinical outcomes such as mortality or postoperative complications. Current evidence does not support routine use of pulsatile flow in adult cardiac surgery, although potential physiological benefits warrant further investigation in standardized modern perfusion protocols.

Keywords: Cardiopulmonary bypass; Pulsatile flow; Non-pulsatile flow; Cardiac surgery; Systematic review and meta-analysis

Perioperative Outcomes of Non-Intubated Versus Conventional Intubated Video-Assisted Thoracoscopic Surgery in Children: A Systematic Review and Meta-Analysis

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Background/Introduction: Non-intubated video-assisted thoracoscopic surgery (NIVATS) has emerged as a potential alternative to conventional intubated VATS (IVATS) in adults, but evidence in pediatric populations remains limited. This systematic review and meta-analysis evaluated the safety, feasibility, and perioperative outcomes of NIVATS compared with IVATS in children.

objectives: To compare the safety, feasibility, and perioperative outcomes of non-intubated versus intubated video-assisted thoracoscopic surgery in pediatric patients through systematic review and meta-analysis.

Method: A systematic search of PubMed, ScienceDirect, Europe PMC, Epistemonikos, and Cochrane CENTRAL was conducted according to PRISMA 2020 guidelines (PROSPERO: CRD420261403757). Eligible studies included randomized

controlled trials, prospective or retrospective cohort studies, observational studies, and propensity-score-matched comparative studies comparing NIVATS with IVATS in pediatric patients. Risk of bias was assessed using the Cochrane Risk of Bias 2.0 tool for the randomized controlled trial and ROBINS-I for the non-randomized observational studies.

Falseroute Central Venous Catheter – Endovascular Management: A Case Report

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Background: Central Venous Catheter (CVC) insertion is a vital procedure for patients requiring central venous access, concentrated drug administration, or hemodynamic monitoring. However, mechanical complications such as vessel wall perforation and the formation of a “false route” carry significant life-threatening risks. We report a case of CVC falseroute into the right pleural cavity, successfully managed endovascularly with PTA Ballooning.

Case Illustration/Description: A 23-year-old female with a complex history of SLE, lupus nephritis, anasarca oedema, and severe hypoalbuminemia required a right internal jugular vein CVC insertion due to difficult peripheral access. Post-procedure, a through-and-through perforation of the right internal jugular vein wall was detected via contrast thoracic CT scan, with the catheter tip misplaced into the posterior right pleural cavity. Direct removal of the catheter led to active intravascular contrast extravasation. To avoid a high-risk open thoracotomy in this compromised patient, an endovascular strategy was utilized. Internal tamponade via percutaneous transluminal angioplasty (PTA) ballooning (14 mm x 80 mm) was performed at the perforation site for 5 minutes. Final evaluation venography confirmed complete resolution of the extravasation. Postoperatively, the patient remained hemodynamically stable with no signs of respiratory distress, pneumothorax, or haemothorax.

Conclusion: A through-and-through venous perforation during CVC insertion is a critical complication that requires careful management rather than blind or immediate catheter withdrawal. Endovascular intervention using PTA ballooning provides a safe, effective, and minimally invasive approach to achieve local haemostasis, effectively minimizing surgical trauma and advanced morbidity in patients with severe comorbidities.

Keywords: False Route Central Venous Catheter, Systemic Lupus Erythematosus, Percutaneous Transluminal Angioplasty, Endovascular Management

Comparative Outcomes of Robotic-Assisted, Mini-Thoracotomy, and Conventional Sternotomy Approaches for Cardiac Myxoma Resection: A Systematic Review and Meta-Analysis

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Background/Introduction: Cardiac myxomas are traditionally excised via conventional sternotomy. Minimally invasive surgery has emerged as a potential alternative, offering reduced trauma and faster recovery.

objectives: This study aims to assess comparative outcomes of robotic-assisted, mini-thoracotomy, and sternotomy for cardiac myxoma.

Method: A comprehensive literature search was conducted across five databases to identify studies comparing robot-assisted (RA), mini-thoracotomy (MT), and median sternotomy (MS) for cardiac myxoma resection. Pooled mean differences or odds ratios with 95% confidence intervals (CIs) were estimated using a random-effects model.

Penetrating neck trauma with pulmonary laceration caused by a tree branch: A Case report

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Background: Penetrating neck injuries represent a significant clinical challenge in emergency settings. The morbidity and mortality are reported to be 10% and 6% of all trauma. In cases where the trauma extends from the neck into the thoracic cavity, associated complications is a rare traumatic entity with limited case documentation in the surgical literature.

Case Illustration/Description: A 34-year-old female patient was transferred from a referring facility following a single-vehicle motorcycle accident in which a sharp tree branch penetrated the right side of the neck. Upon presentation, the patient reported dyspnea accompanied by pain localized to the cervical and thoracic regions with hemodynamically stable. Radiological workup, including cervical and chest X-ray, failed to demonstrate intracervical or intrathoracic foreign body presence. Subsequent computed tomography (CT) of the carotid region identified a tubular foreign body extending from the right cervical region at the parotid gland level into the right intrathoracic cavity at the Th5 paravertebral level, associated with contusion of the apicoposterior segment of the right upper lobe and surrounding hemothorax. Based on clinical and radiological findings, the patient underwent emergency exploratory thoracotomy under general anesthesia. A 17 cm tree branch, penetrating the right pulmonary parenchyma, was pulled out. The tree branch caused a laceration in the left upper lobe, it was treated by lung wedge resection. The patient was discharged on postoperative day five without complication. At the 12-day follow-up after discharge, the patient recovered.

Conclusion: This case illustrates the survivability of complex penetrating impalement injuries when surgical intervention is both timely and appropriately planned. The combination of cervical entry, intrathoracic foreign body migration, pulmonary laceration, and hemothorax—each individually demanding—was successfully managed through a single operative setting. Contrast-enhanced CT proved indispensable in guiding the surgical strategy for open

thoracotomy. The treatment performed in the present case might be effective for cases with similar conditions.

Keywords: Penetrating neck trauma; Hemothorax; Pulmonary laceration; Thoracotomy

Reparability-Oriented Surgical Strategy in Active Native Mitral Valve Infective Endocarditis: A Narrative Review of Reconstructive Techniques, Determinants of Repair Feasibility, and Early and Late Clinical Outcomes

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Background/Introduction: Infective endocarditis (IE) involving the mitral valve is associated with considerable morbidity and mortality, with mitral involvement reported in approximately 43% of cases and a contemporary predominance of staphylococcal organisms. Although valve repair constitutes the established standard for degenerative mitral regurgitation, its applicability in the active phase of infection remains incompletely defined, owing to the friable, infected, and frequently destroyed nature of the affected tissue. The 2023 European Society of Cardiology (ESC) guidelines delineate the indications and timing for operation yet provide limited direction regarding the intraoperative choice between repair and replacement.

objectives: To synthesise the contemporary evidence concerning reconstructive techniques, the determinants of reparability, and the surgical outcomes of active native mitral valve IE, and to derive a pragmatic intraoperative decision framework.

Method: A structured search of seven bibliographic databases covering the period 2000 to 2025 was conducted, and the retrieved evidence was synthesised narratively.

Result: Within high-volume series, a repair-oriented strategy attains reparability rates of approximately 80%, utilising leaflet debridement, triangular or quadrangular

resection, autologous pericardial patch reconstruction, expanded polytetrafluoroethylene (ePTFE) neochordae, and ring annuloplasty. Pooled observational analyses indicate more favourable long-term mortality, stroke, and bleeding outcomes following repair, whereas replacement confers a lower incidence of recurrence; these associations are nevertheless subject to confounding by indication. Perivalvular abscess, renal failure, and *Staphylococcus aureus* infection consistently predict both repair failure and mortality, and the durability of repair in staphylococcal disease remains uncertain.

Conclusion: In active native mitral valve IE, complete eradication of infection through radical debridement supersedes valve preservation as the principal objective. Repair confers durable benefit when sufficient viable tissue persists following debridement. The operative decision should be individualised, governed by lesion anatomy, and undertaken by an experienced endocarditis team.

Keywords: Infective endocarditis; mitral valve repair; active endocarditis; cardiac surgery; reparability

Long-Term Outcomes of Valve-Sparing Repair Versus Transannular Patch Repair in Tetralogy of Fallot: A Systematic Review and Meta-Analysis

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Background/Introduction: Tetralogy of Fallot (TOF) is the most common cyanotic congenital heart disease requiring surgical correction during infancy. Transannular patch (TAP) repair effectively relieves right ventricular outflow tract obstruction but is frequently associated with chronic pulmonary regurgitation, leading to right ventricular dysfunction, arrhythmia, and the need for late pulmonary valve replacement. Valve-sparing repair (VSR) has emerged as an alternative strategy to preserve pulmonary valve function and improve long-term outcomes. However, evidence comparing the long-term effectiveness of VSR and TAP remains inconsistent across observational studies. Therefore, a comprehensive systematic review and meta-

analysis is needed to evaluate the comparative long-term outcomes of these surgical approaches.

objectives: To compare the long-term clinical outcomes of valve-sparing repair and transannular patch repair in patients with Tetralogy of Fallot through a systematic review and meta-analysis, focusing on mortality, reintervention, pulmonary regurgitation, pulmonary valve replacement, right ventricular dysfunction, arrhythmia, and exercise capacity.

Method: A systematic review and meta-analysis was conducted in accordance with the PRISMA 2020 Statement. PubMed, Scopus, Embase, Web of Science, and the Cochrane Library were systematically searched from inception to June 2026. Comparative observational studies evaluating valve-sparing repair (VSR) versus transannular patch repair (TAP) in patients with Tetralogy of Fallot were included. The primary outcomes were long-term mortality and reintervention, while secondary outcomes included pulmonary regurgitation, pulmonary valve replacement, right ventricular dysfunction, arrhythmia, and exercise capacity. Pooled effect estimates were calculated using a random-effects model.

Result: Twenty comparative studies involving 4,438 patients were included. Compared with TAP, VSR was associated with lower long-term mortality (RR 0.68, 95% CI 0.50–0.92), reintervention (RR 0.63, 95% CI 0.48–0.83), pulmonary regurgitation (RR 0.29, 95% CI 0.21–0.41), pulmonary valve replacement (RR 0.42, 95% CI 0.29–0.61), right ventricular dysfunction (RR 0.56, 95% CI 0.40–0.79), and arrhythmia (RR 0.61, 95% CI 0.45–0.83). Exercise capacity was also significantly better after VSR (SMD 0.47, 95% CI 0.26–0.68).

Conclusion: Valve-sparing repair was associated with superior long-term outcomes compared with transannular patch repair, including lower mortality, fewer reinterventions, reduced pulmonary regurgitation, lower rates of pulmonary valve replacement, better right ventricular function, fewer arrhythmias, and improved exercise capacity. Whenever anatomically feasible, valve-sparing repair should be considered the preferred surgical strategy for patients with Tetralogy of Fallot.

Keywords: Tetralogy of Fallot; valve-sparing repair; transannular patch repair; pulmonary regurgitation;

Analysis of Referral Waiting Time on Pulmonary Hypertension Incidence and Postoperative Intensive Care Length of Stay in Pediatric Patients with Congenital Heart Disease.

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Background/Introduction: Delayed referral in pediatric Congenital Heart Disease (CHD) in developing countries accelerates severe Pulmonary Hypertension (PH) progression. Registry data show that prolonged latency triggers pulmonary vascular remodeling from chronic left-to-right shunt exposure, increasing vascular resistance and threatening operability due to irreversible disease.

objectives: This study evaluated the impact of referral waiting time thresholds on PH status, operability status, and postoperative intensive care Length of Stay (LOS).

Chronic Systemic Corticosteroid Exposure Before Adult Cardiac Surgery and Postoperative Outcomes: A Systematic Review and Meta-Analysis

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Background/Introduction: Chronic systemic corticosteroid use is a common baseline exposure among candidates for open cardiac surgery, yet its impact on postoperative outcomes remains poorly characterized, having been studied almost exclusively in transcatheter aortic valve populations rather than open surgical cohorts.

Objectives: This study evaluated in-hospital mortality and hospital length of stay associated with chronic systemic corticosteroid exposure in adults undergoing open cardiac surgery.

Method: This systematic review and meta-analysis was conducted according to the PRISMA 2020 statement. PubMed, Scopus, ScienceDirect, and Google Scholar were searched without date or language restriction. Eligible studies enrolled adults with chronic systemic corticosteroid exposure undergoing open cardiac surgery. Risk of bias was assessed using ROBINS-I. Pooled estimates were calculated using random-effects (REML) models.

Result: A total of 1,141 records were identified from four databases; after deduplication and screening, four studies including 67,608 patients met eligibility criteria. Two studies (n=59,458) contributed to the meta-analysis. Corticosteroid exposure was not significantly associated with in-hospital mortality, with a pooled risk ratio of 0.87 (95% CI 0.57–1.33; $I^2=0\%$), and hospital length of stay, with a pooled mean difference of -0.25 days (95% CI -3.00 to 2.49; $I^2=22.5\%$). Risk of bias was moderate in two studies and serious in two; confounding and selective reporting were the main methodological concerns.

Conclusion: Current evidence from four studies does not show a significant association between chronic corticosteroid exposure and in-hospital mortality or hospital length of stay after open cardiac surgery. Given the limited evidence base and anticipated low certainty, these findings are exploratory. Larger comparative studies are needed before perioperative corticosteroid management is revised beyond current endocrine and anesthesia guidance.

Keywords: Corticosteroids; cardiac surgery; postoperative outcomes; meta-analysis

Expanded Polytetrafluoroethylene (ePTFE) versus Autologous Pericardium as Monocusp Pulmonary Valve in Transannular Patching (TAP) Procedure during Tetralogy of Fallot Repair: A Scoping Review of Durability and Valve Competence

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Background/Introduction: Tetralogy of Fallot (TOF) is the most common cyanotic congenital heart defect, accounting for 7–10% of congenital heart disease. Transannular patching (TAP) during TOF repair increases pulmonary regurgitation (PR) and right ventricular (RV) dysfunction. Augmenting TAP with a monocusp pulmonary valve can reduce PR and preserve RV function, but outcomes depend on valve material.

Objectives: This scoping review compares the long-term durability and functional competence of expanded polytetrafluoroethylene (ePTFE) with autologous pericardium for monocuspid reconstruction.

Method: Following Arksey and O'Malley's framework and the PRISMA-ScR guidelines, we searched PubMed, Cochrane, and Google Scholar for studies from the past 10 years reporting pediatric TOF repair with TAP and monocuspid reconstruction using ePTFE or autologous pericardium. Extracted outcomes included freedom from reintervention, degree of PR, calcification, and RV function.

Continuous Venovenous Hemodialysis in Patients Undergoing Coronary Artery Bypass Grafting (CABG) Across the Spectrum of Renal Function: A Systematic Review and Meta-Analysis

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Background/Introduction: Acute kidney injury (AKI) is a common and serious complication following coronary artery bypass grafting (CABG), contributing significantly to postoperative morbidity and mortality. Continuous venovenous hemodialysis (CVVHD) is widely used in critically ill patients; however, its clinical benefits among patients undergoing CABG, particularly according to

baseline renal function and timing of initiation, remain uncertain.

Objectives: To evaluate the impact of CVVHD on clinical outcomes in patients undergoing CABG, stratified by baseline renal function and timing of initiation.

Method: A systematic review and meta-analysis were conducted in accordance with the PRISMA guidelines. PubMed, Scopus, and Web of Science were searched from inception to January 2026. Studies comparing CVVHD with standard care or alternative renal replacement therapies in adults undergoing CABG were included. Random-effects models were applied to estimate pooled risk ratios (RRs). The primary outcome was all-cause mortality, while secondary outcomes included AKI incidence and the need for renal replacement therapy (RRT).

Result: Ten studies were included. CVVHD was associated with reduced mortality (RR 0.78, 95% CI 0.62–0.97) and AKI incidence (RR 0.72, 95% CI 0.58–0.90). Greater reductions in mortality were observed among patients with pre-existing renal dysfunction (RR 0.65, 95% CI 0.50–0.85), whereas no significant benefit was observed in those with normal renal function. Early initiation of CVVHD was associated with improved renal outcomes and a shorter ICU stay.

Conclusion: CVVHD is associated with improved clinical outcomes in patients undergoing CABG, particularly those with impaired baseline renal function, supporting a risk-stratified approach and early initiation when clinically indicated.

Keywords: Coronary artery bypass grafting (CABG); Acute kidney injury (AKI); Continuous venovenous hemodialysis (CVVHD); Renal replacement therapy (RRT); Early initiation

Surgical Stabilization of Occult Chest Wall Instability in Extensive Posterior Rib Fractures Without Overt Flail Chest After Recent Antiplatelet Therapy : A Case Report

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Background: Rib fractures are a common consequence of blunt thoracic trauma and are associated with substantial morbidity. Posterior rib fractures may produce severe

respiratory compromise despite the absence of clinically apparent flail chest, making patient selection for surgical stabilization challenging. Fracture morphology and physiologic impairment are increasingly recognized as important factors when considering operative management.

Case Illustration/Description: A 63-year-old woman presented after a motorcycle collision with severe left-sided chest pain and progressive dyspnea exacerbated by movement and inspiration. Physical examination revealed tenderness and crepitus over the left posterior hemithorax without paradoxical chest wall motion or clinical flail chest. Chest CT demonstrated multiple posterior rib fractures involving ribs 3–10 with segmental fractures of ribs 5–7 on the lateral view, pulmonary contusion, and bilateral hemothorax. Arterial blood gas analysis showed severe hypoxemia (PaO₂ 50 mmHg, SaO₂ 82%) with mixed acid-base disturbance, reflecting impaired oxygenation associated with pulmonary contusion and ventilation-perfusion mismatch. Initial management included supplemental oxygen, analgesia, and close respiratory monitoring. Given persistent respiratory dysfunction and ongoing antiplatelet therapy, surgical stabilization was deferred until completion of an appropriate clopidogrel washout period. The patient subsequently underwent left posterolateral thoracotomy, evacuation of retained hemothorax, and surgical stabilization of rib fractures using SHAPP rib clips, with fixation of ribs 4–9. Postoperatively, respiratory function, oxygenation, and pain improved progressively, enabling early transfer from the ICU to the general ward, where pulmonary rehabilitation and early mobilization were initiated.

Conclusion: Favorable recovery followed SSRF and hemothorax evacuation in a non-flail chest patient with severe respiratory compromise. This case suggests that operative decision-making should incorporate fracture morphology and physiologic impairment rather than the presence of overt flail chest alone, and stabilization after antiplatelet washout may still achieve good clinical outcomes. Further evaluation is warranted to better define the role of SSRF in carefully selected non-flail chest patients.

Keywords: Blunt thoracic trauma; Posterior rib fractures; Non-flail chest; SSRF; Hemothorax

Anatomical Distribution and Early Access Outcomes of Arteriovenous Fistula Creation in a Hemodialysis Population: A Twelve-Month Descriptive Registry

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Background/Introduction: How a hemodialysis unit creates its arteriovenous fistulas (AVFs)—where on the arm, in which patients, and with what outcomes—is rarely documented systematically, and many centres run access programmes without a formal registry.

Objectives: To characterise the patient profile, anatomical configurations, and early access outcomes of all AVF creations at a single centre over a twelve-month period.

Method: Retrospective analysis of a single-centre consecutive AVF registry, one AVF per patient. Patients who died before access assessment were excluded from access/outcome analyses. Baseline characteristics, kidney disease, access configuration, cannulation success, blood-pump flow adequacy, and early complications were summarised as proportions and means (SD). Because dates were recorded only to the nearest month, no time-to-event analysis was performed; proportions are presented with Wilson 95% confidence intervals (CI).

Result: Of 161 patients (one AVF each), 37 (23.0%) died before outcome assessment, leaving 124 AVFs (mean age 49.5 ± 12.1 years; 67% male; 90% dialysis-dependent). Hypertension was the leading recorded cause of kidney disease (59%), followed by nephrolithiasis (19%) and diabetes (16%). Brachiocephalic fistulas predominated (62%), brachio basilic 23%, radiocephalic 11%—roughly eight upper-arm fistulas per forearm creation. Cannulation succeeded in 94.2% (95% CI 88.5–97.2) and blood-pump flow was adequate in 91.1% (95% CI 84.7–94.9). First cannulation typically occurred around two months after creation. Adverse events included thrombosis (10.6%), access-preserving interventions (13.0%), and abandonment (13.0%); these categories are not mutually exclusive.

Conclusion: This registry captures a real-world programme strongly weighted towards upper-arm configurations, with high early cannulation success alongside a substantial burden of thrombosis, intervention, or abandonment. Its strength is completeness; its limitations are those of any single-centre retrospective registry: reliance on recorded data, exclusion of non-survivors who may differ systematically, no vessel imaging, and event dates too coarse for survival curves.

Keywords: Haemodialysis, Arteriovenous Fistula, Outcomes, Descriptive

The Role of Neutrophil-to-Lymphocyte Ratio as a Predictor of Postoperative Low Cardiac Output Syndrome in Children with Congenital Heart Disease

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1. FKUI

Background/Introduction: Low cardiac output syndrome (LCOS) is a complication following open-heart surgery that significantly contributes to morbidity and mortality in pediatric patients with congenital heart disease (CHD). The neutrophil-to-lymphocyte ratio (NLR) has the potential to act as a simple, feasible, and affordable predictor of LCOS; however, a universal cut-off value has not yet to be established.

Objectives: This study aims to evaluate the role of preoperative and postoperative NLR as predictors of postoperative LCOS in children with CHD

Postoperative Antithrombotic Strategy After Thoracic Endovascular Aortic Repair for Type B Aortic Dissection: A Systematic Review and Meta-Analysis

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Background/Introduction: The optimal postoperative antithrombotic regimen after thoracic endovascular aortic repair (TEVAR) for type B aortic dissection (TBAD) remains

uncertain, particularly regarding aortic remodeling, hemorrhagic complications, reintervention, and survival.

Objectives: To systematically review and meta-analyze the effects of postoperative antithrombotic therapy compared with non-antithrombotic care or alternative regimens on false-lumen thrombosis, aortic remodeling, all-cause mortality, bleeding or hemorrhagic events, aortic reintervention, and ischemic or thrombotic events in adults with TBAD treated successfully with TEVAR

Method: PubMed, EMBASE, and Scopus were searched from inception to 13 June 2026 for randomized controlled trials and prospective or retrospective cohort studies enrolling adults with TBAD treated successfully with TEVAR and comparing postoperative antithrombotic therapy with non-antithrombotic care or an alternative regimen, including single antiplatelet therapy (SAPT) versus dual antiplatelet therapy (DAPT). Risk ratios were pooled using random-effects models.

Result: Six studies involving 2,835 patients were included: one randomized trial and five observational cohorts. Compared with control strategies, postoperative antithrombotic therapy was not associated with higher all-cause mortality (RR 1.13, 95% CI 0.64–2.00) or aortic reintervention (RR 0.93, 95% CI 0.59–1.46). Bleeding estimates were imprecise and did not show a statistically significant pooled difference overall, although individual DAPT-versus-SAPT studies suggested greater hemorrhagic burden with DAPT. Available imaging data indicated comparable complete false-lumen thrombosis and favorable remodeling between antithrombotic and non-antithrombotic groups.

Conclusion: Current evidence does not demonstrate a mortality, reintervention, or remodeling disadvantage of postoperative antithrombotic therapy after TEVAR for TBAD. However, evidence remains limited by retrospective designs, heterogeneous regimens, short follow-up, and overlapping cohorts. SAPT may be preferable to DAPT when bleeding risk is high, but powered prospective trials are needed.

Keywords: Antithrombotic therapy; Aortic remodeling; Bleeding; Type B aortic dissection.

Right-Sided versus Left-Sided Right Ventricle-to-Pulmonary Artery Conduit Placement After the

Norwood Procedure for Hypoplastic Left Heart Syndrome: A Systematic Review and Meta-Analysis

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Background/Introduction: Pulmonary artery growth is crucial for successful staged palliation in hypoplastic left heart syndrome. The optimal position of the right ventricle-to-pulmonary artery (RV-PA) conduit during the Norwood procedure remains uncertain.

Objectives: To compare right-sided versus left-sided RV-PA conduit placement after the Norwood procedure in relation to pulmonary artery development and pulmonary artery-related morbidity.

Method: A systematic search was conducted in PubMed, Cochrane Library, and ScienceDirect. Studies were eligible if they included children undergoing Norwood procedure with RV-PA conduit and reported outcomes related to conduit position, pulmonary artery development, or reintervention. Pooled outcomes included pulmonary artery intervention/reintervention, left pulmonary artery (LPA) diameter, and right pulmonary artery (RPA) diameter. Risk ratios were used for dichotomous outcomes and mean differences for continuous outcomes.

Result: Result: s: Five studies involving 710 patients were included. Four studies directly compared right-sided and left-sided RV-PA conduit placement. Right-sided conduit placement was not associated with a significant difference in pulmonary artery intervention or reintervention (RR 1.20, 95% CI 0.50 to 2.86; $p = 0.68$; $I^2 = 83\%$). However, right-sided placement was associated with significantly larger LPA diameter (MD 0.63 mm, 95% CI 0.10 to 1.16; $p = 0.02$; $I^2 = 30\%$). RPA diameter was comparable between groups (MD 0.19 mm, 95% CI ≥ 0.26 to 0.65; $p = 0.41$; $I^2 = 0\%$). Discussion: Right-sided RV-PA conduit placement may improve LPA development, but pulmonary artery reintervention remains influenced by heterogeneous surgical techniques, definitions, and institutional thresholds.

Conclusion: Right-sided RV-PA conduit placement may improve LPA growth after Norwood palliation, although its effect on reintervention remains uncertain.



Keywords: Hypoplastic left heart syndrome; Norwood procedure; RV-PA conduit; pulmonary artery development; meta-analysis.

One Technique, Two Victories: En Bloc R0 Resection with Four-Quadrant Flap Mobilization and Titanium Mesh Reconstruction in Massive Thoracic Malignancy

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Background: Massive malignant chest wall tumors demand R0 resection while restoring full-thickness thoracic integrity. No algorithm is universally accepted; technical consistency remains underreported. We present two cases applying a unified operative sequence (en-bloc R0 resection, four-quadrant flap mobilization, and titanium mesh fixation) to massive thoracic malignancies of differing histopathology, yielding consistent outcomes.

Case Illustration/Description: Case 1: A 72-year-old male with a recurrent right hemithoracic mass (20×20 cm), two months post-excision. Computed tomography (CT) showed cortical destruction of ribs 3–4, extrapleural extension, and axillary lymphadenopathy. Operative sequence: en-bloc R0 resection of tumor, cystic components, and ribs 4–6; four-quadrant flap elevation to the clavicle, inframammary fold, parasternal line, and anterior latissimus dorsi; titanium mesh fixation with 10 screws; chest tube and vacuum drains. Operative time: 185 min; intensive care unit (ICU): 1 day; discharge: day 5. Histopathology pending multidisciplinary review. Case 2: A 60-year-old male with a progressive right hemithoracic mass (20×20×15 cm) over six months. Intraoperatively, a firm tumor (13×14×15 cm) invaded the anterior parietal pleura and subcutis. Same operative sequence: en-bloc R0 resection of tumor, pectoralis major, and ribs 3–4; titanium mesh fixation with 7 screws. Operative time: 225 min; ICU: 2 days; discharge: day 7. Histopathology: pleomorphic leiomyosarcoma. No complications in either case; both on routine follow-up with no recurrence.

Conclusion: En-bloc R0 resection, four-quadrant flap mobilization, and titanium mesh fixation constitute a reproducible, complication-free operative strategy for massive thoracic malignancy (consistent in execution and outcome regardless of histological subtype) supporting its adoption as a definitive surgical standard for locally advanced chest wall tumors.

Keywords: Chest wall reconstruction, En bloc resection R0 margins, Titanium mesh, Thoracic malignancy

Endovascular versus Open Surgical Repair for Intact Abdominal Aortic Aneurysm: A Systematic Review of Short term Mortality and Long term Re-intervention Rates with Outcome-Specific Risk of Bias Appraisal

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Background/Introduction: Intact abdominal aortic aneurysm (AAA) may be managed by endovascular aneurysm repair (EVAR) or open surgical repair (OSR). The trade-off between EVAR's lower perioperative risk and its long-term durability remains central to elective operative decision-making.

Objectives: To systematically review randomized evidence comparing EVAR and OSR in intact AAA, focusing on 30-day mortality and long-term reintervention, with risk of bias appraised separately for each outcome.

Video Assisted Thoracoscopic Surgery for Pediatric Patent Ductus Arteriosus Closure: Global Outcomes Over Three Decades and a Practice Gap in Indonesia

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Background/Introduction: PDA occurs in roughly 1 in 2,000 term births and in up to 60% of preterm neonates; an unclosed ductus sustains a left-to-right shunt that can progress to heart failure, pulmonary hypertension, and growth failure. VATS has been available for PDA closure since 1991 and is practiced at pediatric centers in many countries, but how evenly it has been adopted across health systems remains poorly characterized.

Objectives: This study synthesized three decades of global evidence on VATS for pediatric PDA closure and assessed its current status in Indonesian cardiac surgical practice.

Method: PubMed, Scopus, and Google Scholar were searched from 1991 to 2026 using "patent ductus arteriosus," "video-assisted thoracoscopic surgery," and "pediatric" as search terms. From eligible series, we extracted data on procedural success, open conversion, complications, and recovery, and pooled these descriptively. A parallel search of the same databases, combined with direct input from senior Indonesian pediatric cardiothoracic surgeons, was used to characterize local practice

Result: Pooled data from over 5,000 cases showed procedural success rates of 95–99%, open conversion in 1–5%, and low complication rates; VATS also produced smaller scars, shorter stays, and faster recovery than open ligation. No equivalent experience exists in Indonesia: the national search found no published case report, case series, or institutional record of VATS for pediatric PDA closure, and the technique remains unused at any center despite established open surgical and transcatheter programs.

Conclusion: Three decades of evidence support VATS as a safe and reproducible option for pediatric PDA closure. Its absence from Indonesian practice reflects a real gap in patient access, not merely in the literature. Addressing it will require structured operator training, pilot centers, and a national outcomes registry. Steps that are achievable but contingent on sustained institutional commitment.

Keywords: Patent ductus arteriosus; Video-assisted thoracoscopic surgery; Minimally invasive cardiac surgery; Pediatric cardiac surgery; Congenital heart disease.

Comparing On-Pump versus Off-Pump Minimally Invasive Cardiac Surgery Coronary Artery Bypass Grafting on Mortality in Complex

Coronary Artery Disease: A Systematic Review and Network Meta-Analysis

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Background/Introduction: Minimal invasive cardiac surgery (MICS) approaches emerged as a promising sternum-sparing alternatives to mitigated the risks of the conventional methods, while providing equivalent revascularization. However, there are no high-level evidences conducted in regards of cardiopulmonary bypass utilization in these technique, which were highly technical demanding and demonstrated conflicting results when done using the off-pump methods.

Objectives: To compare all-cause mortality (ACM) as the primary outcome, and secondary outcome such as stroke, atrial fibrillation (AF), repeat revascularization, and reoperation between off-pump (OPCAB-MICS) and on-pump (ONCAB-MICS) technique.

Beyond Mortality: A Systematic Review of Postoperative Morbidity, Complication, Functional Outcomes, Healthcare Utilization and Cost in Frail Patients Undergoing Cardiac Surgery

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Background/Introduction: Frailty is increasingly recognized as a key determinant of vulnerability to adverse outcomes after cardiac surgery. While its association with mortality is well established, its impact on postoperative morbidity,

functional recovery, healthcare utilization, and costs remains less clearly defined.

Objectives: To systematically evaluate the association between preoperative frailty and postoperative morbidity, functional outcomes, healthcare utilization, and costs among patients undergoing cardiac surgery.

Method: A systematic review was conducted according to PRISMA guidelines. PubMed, ScienceDirect, and Cochrane Library were searched for studies published between 2021 and 2026. Eligible studies included older adults undergoing Coronary Artery Bypass Grafting (CABG) and/or valvular cardiac surgery with preoperative frailty assessment and reported outcomes. Due to substantial methodological and clinical heterogeneity, findings were synthesized narratively.

Result: Twenty-two studies were included. Beyond its association with mortality, preoperative frailty was also consistently associated with increased postoperative complications, functional decline, prolonged hospitalization, greater healthcare utilization, and higher costs. Frail patients experienced higher rates of respiratory complications, acute kidney injury, delirium, sepsis, disability, poorer quality of life, and hospital readmission. Frailty was also associated with fewer Days Alive and Out of Hospital (DAOH), reflecting poorer recovery and increased resource use. Among available assessment tools, the Clinical Frailty Scale (CFS) offered the most practical approach for routine screening. Several studies also suggested that nutritional optimization, exercise-based and multimodal prehabilitation, medication optimization, cognitive assessment, and multidisciplinary geriatric care may improve recovery and DAOH.

Conclusion: Preoperative frailty is a robust and clinically meaningful predictor of adverse outcomes. Routine frailty assessment improves perioperative risk stratification and identifies patients who may benefit from targeted prehabilitation and optimization strategies. In Indonesia, standardized low-cost frailty screening may promote equitable care, optimize resource allocation, reduce prolonged postoperative care, and lessen the economic burden on the healthcare system.

Keywords: frailty; coronary artery bypass grafting; valvular cardiac surgery; postoperative complications

The Impact of Perfusion and Infection-Related Predictors of Amputation Risk in Diabetic Foot Ulcer: A Systematic Review and Meta-Analysis

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Background/Introduction: Diabetic Foot Ulcer (DFU) remains the leading cause of non-traumatic lower extremity amputation (LEA) worldwide. Various perfusion-related and infection-related factors have been reported as predictors of amputation, however, evidence regarding the prognostic value of these predictors remains heterogeneous.

Objectives: This systematic review and meta-analysis aimed to evaluate perfusion-related and infection-related predictors associated with amputation risk in patients with DFU.

Method: A systematic review and meta-analysis was conducted in accordance with the PRISMA guidelines. Electronic databases were searched to identify cohort studies evaluating predictors of amputation in patients with DFU. Study selection, data extraction, and risk of bias assessment were performed using predefined criteria. Included studies were evaluated for risk of bias using the Newcastle-Ottawa Scale (NOS). Meta-analysis was conducted using a random-effects model when at least three studies reported comparable effect estimates.

Persistent Left Vena Cava Rerouting in Patient with Unroofed Coronary Sinus Atrial Septal Defect

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Background: Persistent left superior vena cava (PLSVC) is the most common congenital thoracic venous system abnormality (0.3–0.5%). The presence of PLSVC may give



rise to technical challenge during intracardiac repair, therefore surgeons should find a way to eliminate the right to left shunt.

Case Illustration/Description: we report an 8 years old with unroofed coronary sinus type atrial septal defect (ASD) admitted for surgical ASD closure. During the operation, PLSVC was detected and there was no innominate vein. It was decided to close the ASD with a 0,4 mm PTFE patch. the PLSVC was transected from the left atrium, the proximal part of the right SVC was dissected entirely free. Then we performed PLSVC end-to-end anastomosis to the right atrium with a pericardial roll.

Conclusion: in conclusion, we believe that end-to-end anastomosis of the PLSVC to the right atrium might be a safe and applicable technique for pediatric patients with PLSVC draining into the left atrium.

Keywords: Congenital Heart Defects, superior vena cava, atrial septal defect, right atrium, surgical anastomosis, cardiac Surgical Procedures.

Video-Assisted Thoracoscopic Surgery versus Open Thoracotomy for Descending Necrotizing Mediastinitis: A Systematic Review and Meta-analysis

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Background/Introduction: Descending necrotizing mediastinitis (DNM) is a life-threatening infection descending from oropharyngeal or cervical foci into the mediastinum through cervical fascial planes, with high morbidity and mortality rates. Although open thoracotomy remains the conventional standard, Video-Assisted Thoracoscopic Surgery (VATS) has emerged as a minimally invasive alternative; however, comparative evidence remains limited.

Objectives: This systematic review and meta-analysis compared clinical outcomes of VATS versus open thoracotomy in surgical drainage of DNM.

Method: A systematic literature search of PubMed, Embase, Cochrane Library, and Scopus was performed for studies published from 2000 to 2026. We included randomized

controlled trials, cohort studies, and propensity-score-matched analyses, excluding reports on mediastinitis secondary to cardiac, pulmonary, or esophageal interventions. The primary endpoint was mortality (30-day, 90-day, or in-hospital). Effect sizes were calculated with a random-effects model after comprehensive bias assessment.

Result: Four observational studies, comprising 192 patients, satisfied the eligibility criteria. In the study with the largest number of subjects (n = 141), there was no significant difference in 90-day mortality between VATS and thoracotomy (4.8% vs. 8.6%; adjusted RD = -0.0077, 95% CI: -0.0959 to 0.0805; p = 0.8649). Similar outcomes were observed in a multicenter study (n = 21) where morbidity and mortality rates did not differ, but the VATS procedure was associated with significantly shorter operation time (p = 0.016) and reduced ICU requirements (p=0.026). A supplementary single-center study indicated an overall morbidity rate of 24% and an in-hospital mortality rate of 12%, with no significant differences between groups.

Conclusion: VATS serves as a secure and efficient alternative to open thoracotomy for specific DNM patients, providing similar mortality and morbidity rates while decreasing operative duration and ICU length of stay. Surgical approach should be individualized considering the anatomic location of the infection, with thoracotomy preferred for extensive inferior-posterior mediastinal involvement. Extensive prospective studies are still necessary.

Keywords: descending necrotizing mediastinitis; video-assisted thoracoscopic surgery; thoracotomy.

Age-Related Outcomes of Non-Intubated Versus Intubated Video-Assisted Thoracic Surgery for Non-Small Cell Lung Cancer: A Systematic Review and Meta-Analysis

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Background/Introduction: Although video-assisted thoracic surgery (VATS) is the standard surgical approach for early-stage non-small cell lung cancer (NSCLC) general

anesthesia with one-lung ventilation may increase perioperative risk in elderly patients. Non-intubated VATS has been proposed to mitigate these risks. However, existing literature regarding its comparative perioperative safety and clinical efficacy in elderly populations warrants a comprehensive systematic review.

Objectives: This study compared the perioperative outcomes of NIVATS and conventional intubated VATS in elderly patients with NSCLC.

Method: Following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, we systematically searched PubMed, Springer, ScienceDirect, Wiley, Cochrane, and ClinicalTrial.gov for comparative studies of NIVATS versus conventional VATS in elderly patients (>65 years old) with NSCLC. Meta-analysis was performed using Review Manager (RevMan) 5.4, with pooled effect estimates calculated using the Mantel-Haenszel and inverse variance methods. The primary outcome was overall postoperative complications, with perioperative outcomes analyzed as secondary endpoints.

Del Nido Cardioplegia versus Conventional Cardioplegia for Myocardial Protection in Adult Patients Undergoing Cardiac Valve Surgery: A Systematic Review with Subgroup Analysis of Rheumatic Heart Disease Patients

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Background/Introduction: For decades, repeated cardioplegia dosing has been accepted. Del Nido cardioplegia offers a different approach: a single large-volume dose arrests the heart for up to 90 minutes without re-dosing. Despite its growing use in adult cardiac surgery, how it actually performs in patients with rheumatic heart disease (RHD) undergoing valve surgery remains largely unexplored.

Objectives: We aimed to evaluate the efficacy and safety of Del Nido versus conventional cardioplegia in adults undergoing cardiac valve surgery, with a focused subgroup analysis of the RHD population.

Method: PubMed, Cochrane Library, and Google Scholar were searched on 14 June 2026. We included comparative studies of Del Nido versus conventional cardioplegia in adult valve surgery patients. Risk of bias was assessed using RoB 2 for randomized controlled trials (RCTs) and ROBINS-I for observational studies. Given the clinical heterogeneity across populations and comparator solutions, we used narrative synthesis throughout.

Result: We identified 10 eligible studies, including 3 RCTs and 7 observational studies, with a combined sample of 2,172 patients. Del Nido cardioplegia was associated with shorter cardiopulmonary bypass (CPB) time in 8 of 10 studies, shorter aortic cross-clamp (ACC) time in 7 of 10 studies, lower defibrillation rates in 6 of 7 reporting studies, and reduced cardioplegia volumes across studies. Perioperative mortality was comparable between groups. In the three RHD-specific studies (n=190), the same pattern emerged: shorter CPB and ACC times, fewer defibrillations, and no excess mortality with Del Nido.

Conclusion: Del Nido cardioplegia looks promising for valve surgery, including in patients with RHD. That said, the evidence base, particularly for the RHD population, remains thin and mostly retrospective. Purpose-designed RCTs in this group are still an important unmet need.

Keywords: Del Nido cardioplegia; conventional cardioplegia; valve surgery; rheumatic heart disease; myocardial protection; systematic review

No-Touch Saphenous Vein (NTSV) Graft 1 Year Patency is Superior to Radial Artery and Conventional Saphenous Vein Graft in Coronary Artery Bypass Grafting (CABG) Surgery: A Frequentist Network Meta-Analysis

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Background/Introduction: The optimal second conduit for coronary artery bypass grafting (CABG) remains controversial. Although the radial artery (RA) is currently recommended over conventionally harvested saphenous

vein grafts (CSV), accumulating evidence suggests that no-touch saphenous vein grafts (NTSV) may achieve comparable long-term performance by preserving conduit integrity during harvesting. This study aimed to compare NTSV, RA, and CSV using a frequentist network meta-analysis.

Objectives: To determine the optimal second conduit for coronary artery bypass grafting by comparing no-touch saphenous vein, radial artery, and conventional saphenous vein grafts regarding one-year patency, myocardial infarction, and wound infection using a frequentist network meta-analysis.

Method: A systematic literature search was performed across several databases with Boolean logic Keywords: Randomized controlled trials and observational studies comparing at least two conduit strategies (NTSV, RA, or CSV) in adult CABG patients were included. A random-effects frequentist network meta-analysis using the graph-theoretical approach was conducted in R (netmeta package), with treatment rankings determined by P-scores.

Result: Total of 24 studies were included for synthesis. For one-year graft patency, both NTSV (RR 1.09, 95% CI 1.05–1.13) and RA (RR 1.08, 95% CI 1.01–1.16) demonstrated significantly higher patency than CSV, whereas no significant difference was observed between NTSV and RA. P-score ranking identified NTSV as the highest-ranked conduit (0.807), followed by RA (0.684) and CSV (0.009). No statistically significant differences were observed among conduit strategies for postoperative MI. Wound infection rates were also comparable between NTSV and RA, although NTSV demonstrated superior ranking over CSV.

Conclusion: NTSV grafts provide superior one-year graft patency compared with conventional saphenous vein grafts and perform comparably with radial artery grafts. These findings support NTSV as an effective alternative second conduit in CABG, particularly when RA harvesting is contraindicated or undesirable.

Keywords: CABG, graft patency, network meta-analysis, no-touch saphenous vein, radial artery

Benchmarking Esophagectomy Outcomes in Southeast Asia: A Meta-Analysis Comparing Minimally Invasive and Open Approaches

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Background/Introduction: Minimally invasive esophagectomy (MIE) has been associated with lower perioperative morbidity than open esophagectomy in randomized trials. However, evidence from Southeast Asia remains limited despite regional differences in surgical expertise, patient characteristics, and healthcare resources.

Objectives: To compare postoperative morbidity and early mortality following MIE and open esophagectomy using published evidence from Southeast Asia.

Method: A systematic search of PubMed, Scopus, and regional databases was conducted for studies published between January 2010 and December 2025 reporting esophagectomy outcomes in Southeast Asia. Eligible studies included case series, single-arm cohorts, and non-randomized comparative studies with extractable outcome data. Duplicate patient populations were excluded. Primary outcomes were overall postoperative complications, anastomotic leakage, pulmonary complications, and in-hospital or 30-day mortality. Study quality was assessed using the Methodological Index for Non-Randomized Studies (MINORS), and certainty of evidence was evaluated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework. Random-effects models were used to pool event rates, with subgroup analyses comparing MIE and open esophagectomy.

Result: Nine studies comprising 727 patients were included. Six studies reported MIE outcomes ($n = 599$), whereas three reported open esophagectomy outcomes ($n = 128$). The pooled incidence of overall postoperative complications was lower after MIE than after open surgery (37%; 95% confidence interval [CI], 30–45 vs. 63%; 95% CI, 35–87). Anastomotic leak rates were comparable between groups (12% vs. 10%). Pulmonary complications occurred less frequently following MIE (14% vs. 20%). Early mortality remained low in both groups (1% vs. 3%), with no evidence of increased mortality associated with MIE. Overall study quality was moderate, whereas the certainty of evidence ranged from low to very low.



Conclusion: MIE is associated with lower overall and pulmonary morbidity than open esophagectomy in Southeast Asia without increasing anastomotic leakage or early mortality. These findings support the safety and feasibility of MIE in regional practice and are

Keywords: esophagectomy, minimally invasive surgery, Southeast Asia

Early versus NPWT-Bridged Delayed

Reconstruction for Deep Sternal Wound Infection: A Systematic Review and Meta-Analysis

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Background/Introduction: Deep sternal wound infection (DSWI) is a serious complication following cardiac surgery. Although delayed reconstruction after negative pressure wound therapy (NPWT) sometimes performed to optimize wound conditions before definitive closure, it remains uncertain whether delaying reconstruction results in superior clinical outcomes compared with early reconstruction. We therefore conducted a systematic review and meta-analysis to compare mortality, reinfection rate, and length of hospital stay between these treatment strategies.

Objectives: To determine whether early reconstruction provides better clinical outcomes compared to NPWT-bridged delayed reconstruction in DSWI management strategy.

Method: A systematic literature search was conducted across four databases (PubMed, Cochrane Library, ScienceDirect, and Scopus). Studies comparing early reconstruction with NPWT-bridged delayed reconstruction for deep sternal wound infection were included. The primary outcomes were length of hospital stay, mortality, and reinfection rate. Pooled effect estimates were calculated using RStudio and reported with 95% confidence intervals.

Result: Five studies were included in the meta-analysis. Early reconstruction was associated with a comparable mortality risk to NPWT-bridged delayed reconstruction (RR = 3.13, 95% CI: 0.76–12.90; $p = 0.114$; $I^2 = 55.8\%$). Similarly, no significant difference was observed in the reinfection rate

between the two groups (OR = 1.10, 95% CI: 0.36–3.39; $p = 0.864$; $I^2 = 60.5\%$). Analysis also showed no statistically significant difference in length of hospital stay using the random-effects model (MD = 6.28 days, 95% CI: ± 3.68 to 16.23; $p = 0.217$; $I^2 = 97.6\%$). However, the fixed-effect model suggested a shorter hospital stay with early reconstruction (MD = ± 1.79 days, 95% CI: ± 2.75 to ± 0.84).

Conclusion: Current evidence suggests that early reconstruction and NPWT-bridged delayed reconstruction yield similar outcomes in terms of mortality, reinfection, and hospital length of stay. However, the considerable heterogeneity and limited number of available studies highlight the need for well-designed prospective to establish optimal timing for DSWI management strategy.

Keywords: deep sternal wound infection; early reconstruction; negative pressure wound therapy; mortality; length of stay; reinfection

Reintervention Strategies for Failed Aortic Bioprostheses: A Systematic Review and Meta- Analysis Comparing Valve-in-Valve Transcatheter Replacement with Redo Surgery, and Pooled Transcatheter Reintervention Outcomes

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Background/Introduction: Bioprosthetic aortic valves wear out over time, and because nowadays valve surgery is progressively increasing in younger patients, reinterventions are more common. When a surgical bioprosthesis fails, two options compete: valve-in-valve transcatheter aortic valve replacement (ViV-TAVR) and redo surgical aortic valve replacement (redo-SAVR). When a transcatheter valve fails, redo-TAVR is a newer option. However, comparative evidence guiding selection remains fragmented.

Objectives: To compare early and midterm outcomes of ViV-TAVR against redo-SAVR for failed bioprostheses, and

estimated pooled outcomes of redo-TAVR for failed transcatheter valves.

Method: Following a pre-registered protocol and PRISMA 2020 standards, three databases were systematically reviewed through 2025. The first analysis was a pairwise random-effects meta-analysis giving pooled odds ratios (OR) for binary outcomes and mean differences for gradients. The second pooled single-arm proportions using a double-arcsine transformation. Heterogeneity was measured with the I-squared statistic and risk of bias measured with standard tools according to study design.

Result: Twenty-seven studies found for failed surgical bioprostheses, 13 of them were comparative. VIV-TAVR had lower 30-day mortality than redo-SAVR (OR 0.50; 95% CI 0.39 to 0.65) and equivalent 1-year mortality (1.00; 0.76 to 1.31). VIV-TAVR reduced major bleeding (0.17; 0.11 to 0.28) and acute kidney injury (0.31; 0.20 to 0.46), with no significant difference in stroke or coronary obstruction, but left a higher mean transprosthetic gradient (+3.38 mmHg; 1.15 to 5.61). Across six redo-TAVR studies (n=2,453), pooled 30-day mortality was 4.5% (3.0 to 6.3%), coronary obstruction 0.5%, stroke 2.1%, new pacemaker 6.9%, and 1-year mortality 12.2%.

Conclusion: For failed surgical aortic bioprosthesis, VIV-TAVR gives lower early mortality and fewer procedural complications than redo-SAVR, with equal 1-year survival but higher residual gradients. Redo-TAVR is feasible, with acceptable early mortality and low coronary obstruction. The choice should weigh valve anatomy, life expectancy, and residual-gradient risk over the patient's lifetime.

Keywords: valve-in-valve; transcatheter aortic valve replacement; redo surgical aortic valve replacement; bioprosthetic valve failure; lifetime management.

Surgical Strategy in Triple Valve Surgery with Small Aortic Annulus: An Aortic-First Approach

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Background: Double valve replacement (DVR) in patients with a small aortic annulus (≥21 mm) is challenging because traditional mitral-first sequencing can distort the annulus,

leading to smaller prostheses and higher prosthesis-patient mismatch (PPM). We describe an aortic-first approach during complex multivalve surgery that maintains proper prosthesis size and enables successful tricuspid repair.

Case Illustration/Description: A 64-year-old male with infective endocarditis presented with severe aortic regurgitation due to vegetation on the non-coronary cusp, along with severe mitral regurgitation from posterior leaflet perforation. Mild tricuspid regurgitation, associated with annular dilation, was also observed, all amid preserved left ventricular function (LVEF 65%). The patient had a small aortic annulus (20 mm). Given the diminutive size, an aortic-first strategy was adopted to preserve native geometry. Following excision of the infected valves, a 20-mm mechanical aortic valve was implanted, followed by a 31-mm mechanical mitral valve and De Vega annuloplasty of the tricuspid valve. Intraoperative transesophageal echocardiography confirmed satisfactory prosthetic function without patient-prosthesis mismatch. Postoperative management included temporary pacing and dual inotropic support.

Conclusion: Strategic sequencing is essential to prevent PPM in high-risk 'small aorta' groups. Prioritizing aortic replacement ensures a 20-mm orifice, avoids mitral ring distortion, and enhances prosthetic function, thereby improving outcomes. A rigid aortic prosthesis can obscure the tricuspid's anterosseptal commissure, complicating suture placement. However, this case shows that these visualization issues can be technically addressed to successfully perform tricuspid repair as the final step. A complete aortic-first sequence is an effective strategy for complex multivalvular IE involving a small aortic annulus. By prioritizing aortic replacement, surgeons can ensure optimal prosthetic sizing and prevent PPM. Tailored sequencing and meticulous monitoring remain essential to optimizing outcomes in complex multi-valve interventions.

Keywords: Double valve replacement, infective endocarditis, modified surgical sequence, small aortic annulus, patient-prosthetic mismatch, tricuspid repair

Machine Learning for In-Hospital Mortality Prediction After Pediatric Congenital Heart

Surgery in a Large National Cardiovascular Referral Center Cohort: Temporal Validation of a Clinical Decision-Support Model

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Background/Introduction: Risk prediction after pediatric congenital heart surgery remains challenging because mortality is influenced by surgical complexity, patient condition, and preoperative instability. Machine learning may improve clinical decision-making by integrating these multidimensional factors into individualized risk estimation.

Objectives: To develop and temporally validate a machine learning model for predicting in-hospital mortality after pediatric congenital heart surgery and evaluate its potential as a clinical decision-support tool.

Method: This retrospective cohort study used a prospectively maintained congenital heart surgery database from a high-volume national cardiovascular referral center. Patients operated between 2021 and 2025 were used for model development and internal testing, while early-2026 data were reserved for temporal validation. Extreme Gradient Boosting (XGBoost) was compared with logistic regression and Risk Adjustment for Congenital Heart Surgery (RACHS-1). Performance was assessed using area under the receiver operating characteristic curve (AUC), Brier score, threshold-based classification, and observed mortality across risk groups.

Result: The development cohort included 5,235 patients, with 361 in-hospital deaths (6.9%). In internal testing, XGBoost achieved an AUC of 0.754, sensitivity of 0.620, specificity of 0.800, accuracy of 0.788, and F1-score of 0.287, outperforming RACHS-1 alone. In the independent 2026 validation cohort of 236 patients, including 20 deaths (8.47%), XGBoost maintained good discrimination with an AUC of 0.810 and Brier score of 0.088. Although logistic regression showed a slightly higher AUC of 0.843, XGBoost demonstrated better specificity, positive predictive value, accuracy, F1-score, and calibration. SHAP analysis revealed weight, RACHS-1 score, and operation group as top mortality

predictors. A model-derived dashboard stratified patients into low-, intermediate-, and high-risk groups with observed mortality of 2.51%, 3.92%, and 14.31%, respectively.

Conclusion: A large-cohort machine learning model from a national referral center showed promising temporal validity for mortality prediction after pediatric congenital heart surgery. This approach may support preoperative heart-team discussion, risk optimization, and escalation planning in complex cases.

Keywords: Machine learning; pediatric congenital heart surgery; national referral center cohort; temporal validation; clinical decision-support risk stratification.

Open or Closed? Looking Beyond Technique in Coronary Transfer During Arterial Switch Operation for Transposition of the Great Arteries

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Background/Introduction: Coronary transfer during arterial switch operation (ASO) remains technically challenging. Although open and closed coronary transfer techniques are widely adopted, evidence directly comparing their perioperative outcomes is limited.

Objectives: This systematic review and meta-analysis compared perioperative outcomes between closed and open techniques.

Method: Studies published between 2016 and 2025 reporting closed and/or open coronary transfer during ASO were systematically identified following PRISMA 2020 guidelines. Methodological quality was assessed using the Newcastle-Ottawa Scale (NOS). Comparative studies underwent meta-analysis using Mantel-Haenszel random-effects models, while non-comparative studies were synthesized narratively.

Result: Seven studies (1,888 patients; three closed, four open) were included in the systematic review; three comparative studies (249 closed, 189 open) underwent meta-analysis. All studies were moderate-to-high quality

(NOS 7–9). Early mortality was similar between groups (RR 0.58, 95% CI 0.09–3.70; $I^2=84\%$). Closed transfer was associated with shorter cardiopulmonary bypass time (MD ± 21.06 , 95% CI ± 31.37 to ± 10.74 ; $I^2=24\%$) and lower neopulmonary regurgitation (RR 0.54, 95% CI 0.33–0.89; $I^2=0\%$), whereas other postoperative echocardiographic outcomes were comparable. Narrative synthesis showed that both techniques incorporated technical refinements to optimize coronary transfer, while complex coronary anatomy was consistently identified as a predictor of coronary-related adverse events. Although closed transfer demonstrated selected perioperative advantages, most early outcomes remained comparable between techniques. The accompanying systematic review showed that surgeons in both groups tailored coronary transfer to achieve tension-free positioning while preserving natural coronary geometry. These findings suggest that surgical execution, rather than transfer strategy alone, may substantially influence perioperative outcomes. Successful coronary transfer therefore appears to depend not only on the selected strategy but also on its adaptation to coronary anatomy. Despite moderate-to-high study quality, limited comparative evidence and heterogeneity warrant larger prospective studies.

Conclusion: Closed coronary transfer demonstrated selected perioperative advantages, yet neither technique appears universally superior. Instead, an anatomy-driven approach to coronary transfer during ASO remains essential.

Keywords: arterial switch operation; coronary transfer; transposition of the great arteries

Solitary Fibrous Tumor of the Pleura in Young Adult Patient: A Rare Case Report

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Background: Solitary fibrous tumors of the pleura (SFTP) are rare mesenchymal neoplasms accounting for less than 5% of all pleural tumors. Although most cases are benign,

malignant variants may demonstrate aggressive behavior, including local recurrence and distant metastasis.

Case Illustration/Description: A 22-year-old woman presented with progressive dyspnea, persistent dry cough, significant weight loss, and massive left pleural effusion. Computed tomography revealed extensive left pleural disease with complete collapse of the left lung. Bronchoscopy demonstrated stenosis of the left main bronchus without an endobronchial lesion. Surgical exploration revealed a massive hemothorax and extensive pleural destruction resulting in irreversible lung collapse. As lung re-expansion was not possible, a left pneumonectomy was performed. Histopathological examination confirmed the diagnosis of malignant solitary fibrous tumor of the pleura. Complete surgical resection with negative margins is the most important treatment and predictor of long-term outcome in SFTP. The role of adjuvant chemotherapy or radiotherapy remains limited and is generally reserved for unresectable, recurrent, or metastatic disease due to the lack of evidence supporting routine use. Prognosis following complete resection is generally favorable, with reported 5-year survival rates approaching 89% and 10-year overall survival exceeding 70%. However, recurrence remains a significant concern, particularly in tumors exhibiting malignant histology, large size, high mitotic activity, necrosis, hypercellularity, or positive surgical margins. Reported recurrence rates are approximately 3% for benign tumors and 22% for malignant lesions. These findings emphasize the importance of long-term follow-up and surveillance.

Conclusion: Malignant SFTP is a rare pleural neoplasm that may present with massive pleural effusion and irreversible lung collapse. Complete surgical resection remains the treatment of choice and offers the best chance for long-term disease control. Malignant histologic features, large tumor size, necrosis, and incomplete resection are the main predictors of recurrence and reduced survival. Lifelong follow-up should be considered because recurrence may occur even after apparently curative surgery.

Keywords: pleural solitary fibrous tumor; pleural malignancy; pleural neoplasm

To Extract or to Observe? A Stray Bullet Lodged at the Ostium of the Left Upper Pulmonary Vein



After Left-Sided Cardiac Penetration: Why Haemodynamic Stability Alone Did Not Justify Conservative Management — A Case Report and Literature Review

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Background: Retained intracardiac projectiles after penetrating gunshot wounds are rare, and whether to extract or conservatively observe them is among the most debated decisions in cardiac trauma, with no guidelines to direct it. Haemodynamic stability is often invoked to justify observation, yet projectile location and mobility may override it. Left-sided projectiles communicate with the systemic arterial circulation and carry the highest embolic risk; pulmonary venous involvement is exceptionally rare.

Case Illustration/Description: A 21-year-old man presented eight hours after a stray low-velocity air rifle injury to the left hemithorax, with a single entry wound and maintainable on low-dose vasopressors. Metal artefact on non-contrast computed tomography (CT) mislocalised the projectile to the right ventricle. Thoracostomy and exploratory thoracotomy evacuated haemothorax and pericardial clot but failed to retrieve it. Right ventricular angiography (RV-graphy) excluded a right-sided location and showed synchronous motion with the left ventricular wall, confirming left-sided trabecular fixation. During open heart surgery, intraoperative fluoroscopy captured the projectile migrating from the left ventricular apex toward the left atrium as the heart was manipulated, proving its fixation unreliable. On cardiopulmonary bypass (CPB), a trans-right atrial and trans-interatrial septal approach retrieved the lead-alloy pellet (0.5 × 0.5 cm), free-floating at the ostium of the left upper pulmonary vein, a localisation not previously reported. Despite a course complicated by encephalopathy, right ventricular stunning, and pneumonia, patient was discharged on Day 16.

Conclusion: A left-sided retained intracardiac projectile warrants extraction even when haemodynamic stability appears to favour observation. Left-sided location,

demonstrable mobility, and vasopressor dependency each independently mandated extraction here; stability alone, only pharmacologically maintained, could not exclude catastrophic systemic embolisation, and apparent fixation gave no guarantee against migration. We advocate a location-first appraisal in which stability is necessary but never sufficient for observation, which remains defensible only for right-sided, fixed, asymptomatic projectiles in durably stable patients.

Keywords: Intracardiac bullet; Penetrating cardiac injury; Bullet embolism; Left upper pulmonary vein ostium; Surgical extraction versus conservative management

The Correlation Between Cpb and Aox Time with the Length of Stay of Post Cabg Patients at Cv ICU Hospital of The Ministry of Health Moh. Hoesin Palembang Indonesia In 2023-2025

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Background/Introduction: Coronary Artery Bypass Graft (CABG) is a cardiac surgical procedure that can affect postoperative outcomes, including the length of stay in the CV ICU. The prolonged of CPB and AoX time is thought to be associated with increased morbidity as well as prolonged of postoperative care.

Objectives: To determine the correlation between the length of CPB and AoX time and the length of stay post CABG patients at the CV ICU Of The Ministry Of Health Hospital Dr. Moh. Hoesin Palembang for the 2023–2025 period.

Method: A case series was done in CV ICU Mohammad Hoesin's Hospital of adult patients undergoing CABG. Samples were taken using the total sampling technique, and from 99 subjects, descriptive analysis and Spearman correlation tests were carried out.

Result: There were 99 patients who fulfilled the criteria inclusion. The study subjects were mostly male (75.8%) followed by age of 57.57 ± 8.60 years. The average CPB time is 103.25 ± 26.43 minutes and the average AoX time is 68.61 ± 22.56 minutes. The results of the correlation test showed that there was slightly correlation between CPB and length of stay ($r = 0.178$; $p = 0.077$) and between AoX time and length of stay ($r = 0.158$; $p = 0.119$).

Conclusion: There was slightly correlation between CPB ($r = 0.178$, $p = 0.077$) and AoX time ($r = 0.158$, $p = 0.119$) with the length of stay post CABG patients at the CV ICU of The Ministry of Health Hospital Dr. Moh. Hoesin Palembang for the 2023–2025

Keywords: CABG, CPB, aortic cross-clamp, length of stay, CV ICU

Perioperative Outcomes of Video-Assisted Thoracoscopic Surgery Versus Open Thoracotomy for Lobectomy in Non-Small Cell Lung Cancer: A Systematic Review and Meta-Analysis of Randomised Controlled Trials

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Background/Introduction: Open thoracotomy has long served as the standard surgical approach for lobectomy in non-small cell lung cancer (NSCLC). Over the past three decades, video-assisted thoracoscopic surgery (VATS) has been increasingly adopted as a minimally invasive alternative, yet robust randomised evidence comparing their perioperative profiles remains sparse.

Objectives: This review aimed to compare postoperative complications, length of hospital stay, and chest tube duration between VATS and open thoracotomy for lobectomy in early-stage NSCLC using data from randomised controlled trials (RCTs).

Method: A literature search of PubMed, Proquest, and Europe PMC identified RCTs comparing VATS lobectomy with open thoracotomy in adults with early-stage NSCLC. Four studies totalling 1,191 patients (597 VATS, 594 open thoracotomy) were included. Postoperative complications and length of stay were designated primary outcomes; chest tube

duration was the secondary outcome. Pooled risk ratios (RR) and mean differences (MD) with 95% confidence intervals were estimated using random-effects models.

Irreversible Cerebral Injury Despite Technically Successful Bilateral Carotid Endarterectomy in a Young Postpartum Woman Without Conventional Cardiovascular Risk Factors: A Case Report

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Background: Critical bilateral carotid atherosclerotic stenosis is exceptionally rare in adults younger than 40 years, particularly in women without conventional cardiovascular risk factors. Postpartum cerebrovascular events are more commonly associated with arterial dissection or cerebral venous thrombosis than carotid atherosclerosis. We report a fatal case of bilateral carotid atherosclerotic stenosis in a previously healthy young postpartum woman, emphasizing the limitations of carotid revascularization after irreversible cerebral injury.

Case Illustration/Description: A 30-year-old woman presented one month after cesarean delivery with a two-day history of low-grade fever, generalized weakness, and progressive confusion. She had no history of hypertension, diabetes mellitus, dyslipidemia, smoking, autoimmune disease, chronic kidney disease, hypertensive disorders of pregnancy, or premature cardiovascular disease. Initial investigations were unremarkable except for mild neutrophilic leukocytosis, with normal coagulation and lipid profiles. Within 24 hours, her Glasgow Coma Scale declined from 13 to 7, requiring intubation. Contrast-enhanced brain CT demonstrated diffuse cerebral edema with loss of gray-white matter differentiation, transtentorial and cerebellar tonsillar herniation, and absent contrast opacification of both internal carotid arteries, consistent with critical bilateral carotid stenosis. Emergency simultaneous bilateral carotid endarterectomy with great saphenous vein patch



angioplasty restored satisfactory intraoperative flow, and bilateral non-calcified atherosclerotic plaques were confirmed. Despite postoperative anticoagulation, hemodynamic support, and neuroprotective therapy, the patient remained comatose and died from refractory cardiovascular collapse on postoperative day eight.

Conclusion: This case demonstrates that technically successful carotid endarterectomy cannot reverse neurological injury once malignant cerebral edema and brain herniation are established. Early vascular imaging should be considered in young adults with rapidly progressive encephalopathy, even in the absence of conventional atherosclerotic risk factors, as timely diagnosis may represent the only opportunity for meaningful cerebral salvage.

Keywords: Bilateral carotid stenosis; Carotid endarterectomy; Cerebral edema; Postpartum; Young adult

Paclitaxel-Coated Versus Uncoated Devices for Infrainguinal Endovascular Revascularisation in Chronic Limb-Threatening Ischemia: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Background/Introduction: Chronic limb-threatening ischemia (CLTI) is the most advanced form of peripheral artery disease and is associated with high risks of amputation and death. Paclitaxel-coated balloons and stents were developed to improve vessel patency, but concerns have been raised regarding their long-term safety.

Objectives: To evaluate the efficacy and safety of paclitaxel-coated versus uncoated devices in infrainguinal endovascular revascularisation for patients with CLTI

Method: A systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. PubMed, Cochrane, and ScienceDirect were searched through September 2025. Randomized controlled trials comparing paclitaxel-coated balloons or stents with plain balloon angioplasty or bare-metal stents were included. The primary outcome was major amputation. Secondary

outcomes were primary patency and serious adverse events. The methodological quality was assessed using the Cochrane Risk of Bias tool (RoB-2), and meta-analyses were performed using a random-effects model to pool risk ratios (RRs) with 95% confidence intervals

Result: The analysis included eight RCTs comprising 3,432 high-risk patients, with 1,753 randomized to paclitaxel-coated devices and 1,679 to uncoated comparators. Paclitaxel-coated devices were not associated with increased risk of major amputation compared with uncoated devices (RR 1.03, 95% CI 0.88–1.20; $I^2=0\%$). Primary patency showed a non-significant trend toward benefit (RR 1.26, 95% CI 0.89–1.78), although heterogeneity was substantial ($I^2=80\%$). Serious adverse events occurred at similar rates between groups (RR 0.78, 95% CI 0.37–1.65). Mortality was comparable across arms in all trials.

Conclusion: Paclitaxel-coated devices are not associated with an increased risk of major amputation or mortality when compared with uncoated devices for infrainguinal endovascular revascularisation in CLTI. Although specific trials demonstrated improved primary patency, these angiographic benefits did not consistently translate into better limb salvage or overall survival. The efficacy of paclitaxel technology is highly dependent on patient selection, lesion characteristics, and device generation, suggesting that device deployment should be individualized.

Keywords: Peripheral artery disease; chronic limb-threatening ischemia; paclitaxel-coated balloon; drug-eluting stent

Beyond Valve Replacement: Efficacy and Safety of Y-Incision Annular Enlargement for Lifetime Valve Management—A Systematic Review and Meta-analysis

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Background/Introduction: Small aortic annulus remains a major challenge in surgical aortic valve replacement (SAVR), as it restricts prosthesis size, increases patient–prosthesis mismatch (PPM), and may compromise long-term hemodynamic durability and future valve-in-valve feasibility. Y-incision annular enlargement is a contemporary reconstructive technique designed to expand the annulus and aortic root beyond conventional enlargement.

Objectives: To evaluate the efficacy and safety of Y-incision annular enlargement in improving prosthesis size, hemodynamic outcomes, and future valve management in surgical aortic valve replacement.

Method: A systematic search was performed across ten databases and the protocol was previously registered in PROSPERO (CRD420261429355). Studies reporting Y-incision annular enlargement in adult SAVR were included. Comparative outcomes were synthesized using risk ratios (RR) or mean differences (MD), while broader Y-incision safety outcomes were summarized as pooled single-arm proportions. Random-effects models were applied. Risk of bias was assessed using a ROBINS-I-adapted framework.

Result: Seven studies were included. Compared with conventional annular enlargement, Y-incision significantly reduced moderate/severe PPM (RR 0.29, 95% CI 0.09–0.92), lowered mean aortic valve gradient (MD ± 3.47 mmHg, 95% CI ± 4.45 to ± 2.49), and increased aortic valve area/effective orifice area (MD 0.40 cm², 95% CI 0.27–0.53). Y-incision also enabled implantation of larger prostheses (MD 4.00 mm, 95% CI 3.46–4.54) with approximately two additional valve-size upsizing steps (MD 2.00, 95% CI 1.88–2.12). Across 429 Y-incision cases, pooled early safety outcomes remained favorable, with low early mortality (4%, 95% CI 2–8%), stroke (2%, 95% CI 1–4%), and reoperation/exploration for bleeding (4%, 95% CI 2–8%).

Conclusion: Y-incision annular enlargement improved hemodynamic outcomes, enabled larger prosthesis implantation, and showed acceptable early safety, supporting its use for patients with a small aortic annulus undergoing SAVR.

Keywords: Y-incision annular enlargement; small aortic annulus; patient–prosthesis mismatch; surgical aortic valve replacement; lifetime valve management.

Preoperative CT-Based Sarcopenia as a Prognostic Factor for Postoperative Clinical Outcomes in Patients Undergoing Cardiac Surgery: A Systematic Review and Meta-Analysis

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Background/Introduction: Cardiac surgery carries significant postoperative morbidity, yet conventional risk scores such as EuroSCORE II and STS fail to capture physiological reserve and nutritional status. Sarcopenia—progressive loss of muscle mass, strength, and performance—is increasingly recognized in cardiac patients due to chronic inflammation and cachexia. Computed Tomography (CT) imaging, already routine in surgical candidates, enables objective body composition assessment. Despite growing observational evidence, no prior meta-analysis has comprehensively synthesized CT-based sarcopenia's prognostic value across cardiac surgery outcomes.

Objectives: This meta-analysis aimed to determine the pooled effect of preoperative CT-based sarcopenia on in-hospital mortality and key secondary clinical outcomes following open cardiac surgery.

Method: This PRISMA-compliant review searched six databases from inception to June 2026, including cohorts reporting a validated binary CT-based sarcopenia threshold in adults undergoing elective open cardiac surgery. Binary outcomes were pooled as odds ratios (random-effects); continuous outcomes as mean differences (random-effects). Heterogeneity (², Cochran Q), leave-one-out sensitivity, subgroup analysis, Egger's test/trim-and-fill, and risk-of-bias assessment were performed.

Comparative Outcomes of Arterial Cannulation Strategies in Open Aortic Arch Surgery for Acute Type A Dissection and Elective Repair: A Systematic Review and Network Meta-Analysis

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Background/Introduction: Optimal arterial cannulation strategy for open aortic arch surgery is unresolved, as axillary, innominate, and femoral approaches differ in their implications for cerebral and end-organ outcomes.

Objectives: This network meta-analysis (NMA) compared these strategies across neurological, survival, renal, and operative outcomes in acute type A dissection and elective aortic arch repair.

Method: A comprehensive search through PubMed, Cochrane Library, EuropePMC, and Scopus identified observational studies and randomized controlled trials comparing axillary, innominate, and femoral arterial cannulation in adults undergoing open aortic arch surgery with cardiopulmonary bypass (CPB). Primary outcomes were stroke and early mortality. Secondary outcomes were acute kidney injury (AKI) requiring renal replacement therapy and CPB time. Pooled risk ratios (RR) and mean differences (MD) were generated using frequentist random-effects pairwise meta-analysis and NMA, with axillary cannulation as the reference node.

Result: Thirteen studies involving 3,898 patients (axillary n=2,318; femoral n=970; innominate n=610) were included. On NMA, femoral cannulation was associated with significantly higher early mortality than axillary (RR 1.23, 95% CI 1.01–1.50) and innominate (RR 1.72, 95% CI 1.13–2.62), and significantly higher stroke risk than innominate (RR 2.05, 95%

CI 1.09–3.83), consistent with direct pairwise evidence. Innominate cannulation showed significantly shorter CPB time than femoral (MD –19.71 minutes, 95% CI –37.26 to –2.16); a similar advantage over axillary was significant on network estimation (MD –15.80 minutes, 95% CI –31.07 to –0.53) but not supported by direct evidence alone ($I^2=87\%$). No significant differences emerged for AKI. SUCRA rankings consistently favored innominate and disfavored femoral across stroke, mortality, and CPB time, with no significant network inconsistency or publication bias detected.

Conclusion: Femoral cannulation carried significantly higher stroke and early mortality risk than innominate, and higher mortality than axillary. Innominate showed the most favourable overall profile for neurological, survival, and operative outcomes, though evidence remains predominantly observational.

Keywords: Aortic arch surgery; arterial cannulation; network meta-analysis; stroke; cardiopulmonary bypass

Does Coronary Anatomical Complexity Matter? Long-Term Outcomes of Percutaneous Coronary Intervention Versus Coronary Artery Bypass Grafting for Unprotected Left Main Coronary Artery Disease: A Systematic Review and Meta-analysis

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Background/Introduction: The optimal revascularization strategy for unprotected left main coronary artery disease remains debated. Long-term comparative outcomes between percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG), particularly according to SYNTAX score, remain uncertain.

Objectives: To compare long-term outcomes of PCI versus CABG and assess the impact of SYNTAX score in unprotected left main coronary artery disease.

Method: Five electronic databases were searched through June 2026 for randomized controlled trials and comparative



observational studies comparing PCI with CABG. Pooled ORs with 95% CIs were calculated using Review Manager 5.4.

Hyperbaric Oxygen Therapy Preconditioning in Coronary Artery Bypass Graft Surgery: A Systematic Review of Randomized Controlled Trials

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Background/Introduction: Hyperbaric oxygen therapy (HBOT) involves breathing 100% oxygen in a hyperbaric chamber pressurized to at least 1.4 atmospheres absolute (ATA). HBOT preconditioning has emerged as a promising strategy to reduce ischemia-reperfusion injury and improve perioperative outcomes in patients undergoing coronary artery bypass graft (CABG) surgery. However, the clinical effectiveness of this intervention remains uncertain, and no systematic review has specifically synthesized evidence from randomized controlled trials (RCTs) in this setting.

Objectives: To evaluate the effectiveness of HBOT preconditioning in improving perioperative outcomes among patients undergoing CABG surgery.

Method: This systematic review was conducted in accordance with the PRISMA 2020 guidelines. A comprehensive literature search was performed in PubMed, Scopus, Web of Science, Google Scholar, and the Cochrane Library. Eligible studies were randomized controlled trials comparing HBOT preconditioning with standard perioperative care in adults undergoing CABG. Study selection, data extraction, and risk of bias assessment using the Cochrane RoB 2 tool were conducted independently by two reviewers. Due to methodological and clinical heterogeneity across studies, findings were synthesized narratively.

Result: Three randomized controlled trials involving 194 patients were included. HBOT preconditioning was associated with improved myocardial protection, reduced postoperative cardiac biomarker release, shorter intensive care unit stay, and lower inotropic requirements in patients

undergoing on-pump CABG. Additional evidence suggested attenuation of systemic inflammatory responses and reduced postoperative neuropsychological dysfunction. However, one trial reported no significant benefit among patients undergoing off-pump CABG. Overall, the included studies were limited by their small sample sizes and single-center designs.

Conclusion: Current evidence from randomized controlled trials suggests that HBOT preconditioning may improve perioperative outcomes, particularly in patients undergoing on-pump CABG surgery, through myocardial and systemic protective effects. However, larger multicenter randomized trials are needed to confirm these findings.

Keywords: Hyperbaric oxygen therapy; Coronary artery bypass graft surgery; Preconditioning; Ischemia-reperfusion injury; Myocardial protection

Impact of Conduit Selection and Surgical Harvesting Techniques on Intraoperative Transit-Time Flow Measurement Parameters with Early and Long-Term Clinical Outcomes in Adult Patients Undergoing Coronary Artery Bypass Grafting: A Systematic Review

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Background/Introduction: Intraoperative transit-time flow measurement (TTFM) is standard for coronary artery bypass grafting (CABG) quality control. However, flow parameters vary significantly depending on conduit type and harvesting technique. Standardizing expected TTFM values for specific grafts is crucial for accurate intraoperative decision-making.

Objectives: To evaluate the impact of conduit type and harvesting techniques on intraoperative TTFM parameters and clinical outcomes in adult CABG patients.

Method: A systematic review was conducted following PRISMA guidelines. We searched PubMed, Scopus, and Cochrane databases for studies comparing TTFM parameters across different conduits and harvesting techniques in CABG. Primary outcomes were mean graft

flow, pulsatility index, and diastolic filling. Secondary outcomes included graft patency and failure rates. Due to heterogeneity, data synthesis was performed qualitatively.

Result: We included five studies comprising 988 patients. Semiskeletonized left internal mammary artery (LIMA) grafts demonstrated substantially higher diastolic filling than pedicled LIMA, indicating superior preservation of diastolic flow delivery. Similarly, in situ right internal mammary artery (RIMA) achieved higher diastolic filling than free RIMA configurations, suggesting that maintaining native vascular origin optimizes hemodynamic performance. When grafted to the left anterior descending artery, saphenous vein grafts (SVG) exhibited higher mean graft flow and lower pulsatility index than LIMA; however, this hemodynamic advantage did not translate to long-term outcomes. At five-year follow-up, LIMA maintained markedly superior patency compared to SVG. Sequential graft configurations in the right coronary system produced superior flow dynamics and fewer early failures than single grafts. Mean graft flow consistently emerged as the most robust predictor of long-term graft failure.

Conclusion: Conduit choice and harvesting techniques significantly influence TTFM parameters. Semiskeletonized LIMA and sequential configurations provide superior intraoperative flow dynamics. Surgeons should consider applying technique-specific TTFM thresholds rather than universal cutoffs to prevent unnecessary revisions, optimizing graft patency and resource utilization.

Keywords: Coronary Artery Bypass Grafting; Transit-Time Flow Measurement; Surgical Harvesting Technique; Conduit Selection; Graft Patency

Precision Imaging in Peripheral Arterial Disease: A Systematic Review and Meta-Analysis of Intravascular Ultrasound-Guided versus Angiography-Guided Angioplasty

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Background/Introduction: Peripheral artery disease (PAD) remains a major cause of morbidity and mortality worldwide. Endovascular angioplasty has established as a main treatment for femoropopliteal and infrapopliteal disease, but optimal imaging guidance remains debated. Intravascular ultrasound (IVUS) provides more accurate vessel assessment than angiography and may optimize balloon sizing, drug delivery, and procedural outcomes. Although IVUS guidance has shown benefits in coronary interventions, its impact on outcomes in PAD remains uncertain.

Objectives:

To evaluate the efficacy and safety of IVUS-guided versus angiography-guided angioplasty in patients with lower extremity PAD.

Method: Following PRISMA guidelines, eligible studies included randomized controlled trials and cohort studies directly comparing IVUS-guided and angiography-guided angioplasty in adults with PAD. Primary outcomes were freedom from target-lesion reintervention (F-TLR) and procedural success. Secondary outcomes included all-cause mortality. Risk of bias was assessed using the Cochrane tool for RCTs and the Newcastle-Ottawa Scale for observational studies. Random-effects models were used to pool hazard ratios and risk ratios with 95% confidence intervals.

Result: Three studies involving 534 patients were included. Pooled analysis showed no statistically significant difference between IVUS-guided and angiography-guided groups for F-TLR (RR 0.52, 95% CI 0.12–2.31; $p=0.39$; $I^2=51\%$), all-cause mortality (RR 0.78, 95% CI 0.28–2.20; $p=0.64$; $I^2=83\%$), or procedural success (RR 1.18, 95% CI 0.89–1.57; $p=0.25$; $I^2=89\%$). Directional trends favored IVUS, particularly in studies with complex lesions and CLTI populations. IVUS consistently enabled larger balloon sizing and improved

perfusion metrics, even when hard endpoints were not statistically different.

Conclusion: IVUS guidance angioplasty for PAD does not uniformly improve outcomes but offers procedural and potential clinical advantages in anatomically challenging disease.

Keywords: Peripheral artery disease; drug-coated balloon; intravascular ultrasound; angioplasty; meta-analysis.

Single-Stage Versus Two-Stage Repair for Tetralogy of Fallot: A Systematic Review and Meta-Analysis

Wahyudi Permana Darlis¹

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Background/Introduction: The optimal surgical strategy for Tetralogy of Fallot (TOF), primary complete repair versus a two-stage approach, remains controversial. This meta-analysis evaluates mortality, reintervention rates, and survival outcomes between these two strategies in pediatric patients to guide clinical decision-making.

Objectives: This meta-analysis aims to systematically evaluate the mortality, reintervention rates, and long-term survival outcomes of single-stage versus two-stage repair strategies to clarify the optimal surgical management pathway for pediatric patients.

Method: A systematic literature search was conducted across PubMed, Scopus, and the Cochrane Library for articles published between January 2015 and November 2025, adhering to PRISMA guidelines. Eligible studies included six retrospective cohort comparing single-stage (primary complete intracardiac repair) to two-stage repair (initial palliation followed by complete repair) in pediatric patients with TOF. Data synthesis was performed using a random-effects model due to significant heterogeneity, with results expressed as Odds Ratios (OR) and 95% Confidence Intervals (CI).

Result: Six retrospective cohort studies comprising a total of 9,143 pediatric patients were included in the quantitative synthesis. The pooled analysis demonstrated no statistically significant difference in mortality rates between the single-stage and two-stage groups (OR 0.81; 95% CI 0.38–1.73; $p=0.58$), though high heterogeneity was noted ($I^2=87\%$). Similarly, there was no significant difference observed in

reintervention rates (OR 0.53; 95% CI 0.23–1.24; $p=0.14$) or long-term survival rates (OR 0.66; 95% CI 0.34–1.30; $p=0.23$). Although not statistically significant, the point estimates across all outcomes consistently showed a trend favoring the single-stage repair approach.

Conclusion: Single-stage repair offers comparable mortality and survival outcomes to the two-stage approach, with a non-significant trend toward reduced reinterventions. Primary complete repair is a safe and highly effective strategy for the majority of patients; however, the choice of surgical timing and strategy must remain individualized based on patient-specific factors such as anatomy and prematurity, rather than adhering to rigid institutional protocols.

Keywords: single-stage repair; two-stage repair; tetralogy of fallot

Defining Success in Valve-Sparing Repair for Tetralogy of Fallot: A Systematic Review of Predictive Factors

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Background/Introduction: Valve-sparing repair in Tetralogy of Fallot may reduce pulmonary regurgitation and preserve right ventricular function, but its success depends on accurate anatomical and intraoperative prediction.

Objectives: This systematic review and meta-analysis aimed to evaluate predictors of successful valve-sparing repair in patients with Tetralogy of Fallot undergoing primary repair.

Method: A systematic search was conducted in PubMed, Cochrane Library, and ScienceDirect. Studies were included if they evaluated preoperative or intraoperative predictors of valve-sparing repair, pulmonary valve preservation, non-transannular patch repair, or transannular patch requirement in Tetralogy of Fallot.

Result: From 1,987 identified records, 8 studies involving 892 patients were included. Valve-sparing or non-transannular patch repair was achieved in 607 patients, 68.0%. The most consistent predictors were higher pulmonary valve annulus Z-score, larger pulmonary annulus diameter, higher great artery ratio, higher pulmonary annulus index, higher pulmonary annulus area index, and favorable main pulmonary artery Z-score. Pulmonary valve morphology also influenced success, with tricuspid morphology favoring preservation and monocuspid, bicuspid, dysplastic, or unicommissural valves reducing prediction accuracy. Valve-sparing repair was generally associated with less pulmonary regurgitation, shorter ventilation, shorter intensive care stay, and shorter hospitalization.

Conclusion: Successful valve-sparing repair in Tetralogy of Fallot requires an integrated assessment of annular size, ratio-based echocardiographic indices, valve morphology, and intraoperative hemodynamics.

Keywords: Tetralogy of Fallot; valve-sparing repair; transannular patch; pulmonary valve annulus; pulmonary regurgitation.

The Crystal Ball in Cardiac Surgery to Predict, Prepare, Prevent: Echocardiographic Left Atrial Enlargement as a Roadmap for Left Atrial Appendage Occlusion to Reduce Postoperative Atrial Fibrillation in Coronary Artery Bypass Grafting

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Background: Postoperative atrial fibrillation (POAF) remains the most common arrhythmic complication following coronary artery bypass grafting (CABG), affecting 20–50% of patients and contributing to increased morbidity, thromboembolic events, prolonged hospitalization, and healthcare costs. Left atrial (LA) enlargement reflects

chronic atrial remodeling and has emerged as a potential predictor of POAF. Early identification of patients with a vulnerable atrial substrate may facilitate individualized perioperative preventive strategies, including consideration of concomitant left atrial appendage occlusion (LAAO). This case highlights the potential value of preoperative echocardiographic LA enlargement as a simple, readily available marker for identifying patients at increased risk of persistent POAF following CABG.

Case Illustration/Description: A 59-year-old man with severe diffuse triple-vessel coronary artery disease underwent surgical myocardial revascularization. Preoperative electrocardiography demonstrated sinus rhythm without atrial fibrillation. Transthoracic echocardiography revealed preserved left ventricular systolic function and marked LA enlargement, with a left atrial anterior–posterior diameter of 47 mm measured by M-mode in the parasternal long-axis view. Coronary angiography confirmed extensive calcified multivessel disease. The operation was initiated as off-pump CABG but required conversion to on-pump CABG because of intraoperative hemodynamic instability and ventricular fibrillation. Approximately 24 hours postoperatively, the patient developed new-onset atrial fibrillation with rapid ventricular response. Intravenous amiodarone achieved satisfactory ventricular rate control but failed to restore sinus rhythm. Serial electrocardiographic monitoring demonstrated persistent atrial fibrillation throughout hospitalization. The patient remained hemodynamically stable without thromboembolic, cerebrovascular, or other major postoperative complications and was discharged on postoperative day six with persistent atrial fibrillation, but still receiving guideline-directed anticoagulant and rate-control therapy.

Conclusion: Incorporating routine LA assessment into preoperative evaluation may improve risk stratification, optimize perioperative management, and support consideration of adjunctive surgical strategies, including prophylactic LAAO, as part of a personalized approach to preventing POAF and its associated complications.

Keywords: Postoperative atrial fibrillation; Coronary artery bypass grafting; Left atrial enlargement; Transthoracic echocardiography; Left atrial appendage occlusion

Diagnostic Challenge of Right-Sided Spontaneous Diaphragmatic Hernia in an Elderly Patient: A Case Report

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Background: Diaphragmatic hernia is a condition in which a cavity organ migrates into the thoracic cavity due to a diaphragmatic defect. Diaphragmatic hernias are classified as congenital or acquired. Acquired hernias are usually caused by trauma. Diaphragmatic hernias caused by other factors are rare and therefore documented as case reports. Defects involving the diaphragm alone are rare, with approximately 80-100% of diaphragmatic defects occurring in conjunction with other pathologies. Nonspecific clinical manifestations and radiological features that can mimic other conditions, such as pneumothorax and pleural effusions, often cause diaphragmatic hernias to be missed, leading to misdiagnosis and poor management.

Case Illustration/Description: A 73-year-old female patient presented with complaints of shortness of breath during activity, chest pain, and a productive cough. A chest X-ray revealed a pleural effusion on the right side, leading to suspicion of lung cancer and admission for further diagnostic testing. Further examination revealed a CT scan, revealing herniation of the liver, stomach, duodenum, and part of the ascending colon. A thoracotomy was performed to close the diaphragmatic defect. The operation lasted 4 hours, resulting in 100cc of blood loss. The patient was admitted to the intensive care unit (ICU). After stabilizing, she was admitted to the ward and discharged after her condition improved.

Conclusion: Diaphragmatic hernias can occur in adults even without a history of trauma. Nonspecific clinical manifestations that can mimic other conditions can lead to inappropriate management. Therefore, additional tests are necessary for a more accurate diagnosis.

Keywords: right-sided diaphragmatic hernia ; case report ; diagnostic challenge

Recognizing the Window for Definitive Surgery in Recurrent Spontaneous Pneumothorax: An Evidence-Based Case Report

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Background: Recurrent spontaneous pneumothorax is associated with substantial morbidity particularly in patients with underlying structural lung abnormalities. While current guidelines recommend definitive surgical intervention after recurrent ipsilateral episodes, repeated conservative management remains common in clinical practice. This evidence-based case report evaluated whether definitive surgical management is more effective than conservative treatment in preventing recurrent spontaneous pneumothorax.

Case Illustration/Description:

A 41-year-old man presented with a fourth episode of right-sided spontaneous pneumothorax over a 7-year period, all managed conservatively with chest tube drainage. Patient previous chest computed tomography demonstrated a giant bulla and multiple bullae in the right lung, fulfilling indications for definitive surgical treatment. Although referral for pleurodesis and bullectomy had been made, patient refuses to undergo surgery. During current admission, the patient was diagnosed with HIV infection, subsequently developed progressive deterioration and respiratory failure resulting in death. A literature search was conducted in PubMed and Europe PMC on June 14, 2026. Primary studies published in English or Bahasa Indonesia between 2021 and 2026 comparing surgical and conservative management of spontaneous pneumothorax were included. Five retrospective studies met the eligibility criteria. Across all studies, surgical intervention was associated with lower recurrence rates than conservative management, ranging from 5% to 16.7% following surgery compared with 12% to 48.5% after chest tube drainage alone. Evidence suggested potential benefits of surgical intervention in patients with recurrent pneumothorax and bullous lung disease.

Conclusion: This case illustrates appropriate initial conservative management and a clear indication for

transition to definitive surgical management after recurrent pneumothorax episodes. Available evidence consistently supports video-assisted thoracoscopic surgery with bullectomy and pleurodesis to reduce recurrence more effectively than repeated chest tube drainage. Although the patient's condition was complicated by multiple clinical factors that likely contributed to the fatal outcome, this case highlights the importance of timely recognition for definitive surgical management following recurrent spontaneous pneumothorax.

Keywords: recurrence, spontaneous pneumothorax, video-assisted thoracic surgery, chest tube

Jugaad Innovation: A Resource-Adapted Tunneled Pleural Catheter Constructed from a Modified Silicone Nasogastric Tube for Tuberculous Bronchopleural Fistula: A Case Report

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Background: Bronchopleural fistula (BPF) is a challenging complication that often requires prolonged pleural drainage to control persistent air leak and pleural infection. Indwelling pleural catheters (IPCs) provide effective long-term pleural drainage; however, access to commercial IPC systems remains limited in many healthcare settings. We report a case of tuberculous bronchopleural fistula successfully managed using a modified tunneled pleural catheter constructed from a silicone nasogastric tube.

Case Illustration/Description: A 40-year-old man presented to the emergency department with dyspnea for one week and an intermittent productive cough. He had pulmonary tuberculosis and was receiving anti-tuberculosis therapy for three months. Initial chest radiography demonstrated a spontaneous pneumothorax, and a chest tube was inserted for pleural drainage. During hospitalization, persistent expiratory bubbling suggested an ongoing air leak. Chest computed tomography confirmed

tuberculous bronchopleural fistula. Following pleurodesis, a modified tunneled pleural catheter constructed from an 18-Fr silicone nasogastric tube was inserted for long-term pleural drainage. The catheter was modified with a custom silicone cuff and placed using a tunneled technique. Initial drainage yielded approximately 300 mL of pleural fluid. The patient was discharged three days later with the catheter in place. The patient underwent monthly follow-up for four months. Pleural drainage decreased to approximately 100 mL per week, while serial chest radiographs demonstrated gradual resolution of the pneumothorax. The catheter remained patent without obstruction or catheter-related infection. Air leak resolved, as indicated by the absence of air bubbling, and no repeat chest tube insertion was required. After four months, the catheter was successfully removed.

Conclusion: A modified tunneled pleural catheter constructed from a silicone nasogastric tube provided effective long-term pleural drainage without catheter-related complications in this patient. This technique may represent a feasible alternative when commercial IPC systems are inaccessible, although further clinical evaluation is required.

Keywords: Bronchopleural fistula; indwelling pleural catheter; tuberculosis; pleural drainage; silicone nasogastric tube

Ductal Stenting versus Modified Blalock-Taussig Shunt for Duct-Dependent Pulmonary Blood Flow: An Updated Systematic Review and Meta- Analysis of Comparative Clinical Outcomes and Pulmonary Artery Growth

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Background/Introduction: Duct-dependent pulmonary blood flow is a critical form of congenital heart disease requiring early palliation to maintain adequate pulmonary

circulation. Although the modified Blalock-Taussig shunt has long been the standard surgical approach, ductal stenting has emerged as a less invasive alternative with the potential to reduce peri-procedural morbidity and improve postoperative recovery.

Objectives: To compare ductal stenting with the modified Blalock-Taussig shunt in patients with duct-dependent pulmonary blood flow regarding clinical outcomes, reintervention, resource utilization, and pulmonary artery growth.

Method: A systematic literature search was performed through Scopus, PubMed, Epistemonikos, ScienceDirect, Cochrane Library, Wiley Online Library, and Europe PMC (PROSPERO: CRD420261435673). Identified comparative studies evaluating ductal stenting versus the modified Blalock-Taussig shunt or surgical systemic-to-pulmonary shunts. Continuous and dichotomous outcomes were pooled using random-effects meta-analysis and reported as odds ratios (ORs) or mean differences (MDs) with 95% confidence intervals (CIs), respectively. Risk of bias was assessed using the Risk Of Bias In Non-randomized Studies-of Interventions (ROBINS-I) tool.

Result: Ten comparative studies involving 1,147 patients were included. Ductal stenting demonstrated no significant differences compared with the modified Blalock-Taussig shunt in mortality (OR 0.88; 95% CI 0.57–1.38), reintervention (OR 0.76; 95% CI 0.32–1.80), or procedural complications (OR 0.36; 95% CI 0.04–3.20). However, ductal stenting significantly reduced intensive care unit (ICU) length of stay (MD -5.85 days; 95% CI -10.13 to -1.56) and mechanical ventilation duration (MD -2.29 days; 95% CI -3.14 to -1.45). Hospital stay and pulmonary artery growth outcomes were comparable between groups.

Conclusion: Ductal stenting provides similar mortality, procedural safety, reintervention rates, and pulmonary artery growth compared with the modified Blalock-Taussig shunt while significantly reducing ICU stay and mechanical ventilation duration. These findings support ductal stenting as an effective alternative to surgical shunting in appropriately selected patients, particularly in experienced centers.

Keywords: Ductal stenting; Modified Blalock-Taussig shunt; Duct-dependent pulmonary blood flow; Pulmonary artery growth; Meta-analysis.

Tailoring Surgical Exposure for Giant Intrathoracic Liposarcoma: Determinants of Complete Resection and Debulking Surgery

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Background: Liposarcoma is one of the most common soft tissue malignancies in adults, yet primary intrathoracic liposarcoma remains exceedingly rare, accounting for less than 2% of all liposarcomas. Giant intrathoracic liposarcoma presents significant surgical challenges because of its size and proximity to vital intrathoracic structures. Although complete surgical resection remains the cornerstone of treatment, its feasibility is often limited by tumor anatomy and involvement of adjacent vital structures. This case series describes our experience with tailored surgical approaches and factors influencing complete resection and debulking surgery.

Case Illustration/Description: We retrospectively reviewed three patients with giant intrathoracic liposarcoma who underwent surgical treatment at a tertiary referral center. Clinical presentation, imaging findings, operative reports, postoperative outcomes, and follow-up data were analyzed. One patient with a giant bilateral mediastinal liposarcoma underwent clamshell thoracotomy, allowing near-complete macroscopic tumor removal because the tumor displaced rather than invaded adjacent vital structures. Two patients with unilateral intrathoracic liposarcomas underwent posterolateral thoracotomy. Still, they required debulking surgery due to involvement of the phrenic nerve, bronchial tree, and chest wall, which precluded safe complete tumor removal. Postoperative management varied according to the extent of residual disease. One patient subsequently received adjuvant chemotherapy, while the remaining patients continued multidisciplinary follow-up, including management of postoperative complications and evaluation for further oncologic treatment.

Conclusion: In giant intrathoracic liposarcoma, the feasibility of complete tumor resection is determined primarily by anatomical invasiveness rather than tumor size. Large, well-encapsulated tumors without invasion of critical structures may be amenable to extensive resection despite their size, whereas smaller infiltrative tumors often require debulking surgery. Surgical exposure, including clamshell and posterolateral thoracotomy, should be selected according to tumor anatomy to maximize safe tumor resection within a multidisciplinary treatment strategy.

Keywords: intrathoracic liposarcoma; thoracotomy; case series

Clinical Consequences of Delayed Care in Wagner Grade 2–3 Diabetic Foot Ulcers: A Case Series Evaluating Infection Progression, Length of Stay, and Limb Loss

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Background: Introduction: Diabetic foot issues represent a major health concern; diabetic foot ulcers (DFU) are a significant problem due to the continuously rising number of patients, the difficulty of healing, the immense cost of treatment, and the reduced quality of life for patients, their families, and the community (Wijaya, L. et al., 2019). Diabetic foot complications are a significant cause of non-traumatic amputations, yet they are preventable. Diabetic foot infections can lead to conditions such as nerve damage resulting in a reduced ability to sense pain, heat, or cold, accompanied by tingling, burning sensations, and sharp pain and diabetic ulcers, which are wounds that most frequently appear on the soles of the feet or beneath the big toe due to poor blood circulation (Bajaj, M. et al., 2026). These issues can be attributed to factors such as blood sugar levels and age (American Diabetes Association, 2024). Therefore, the severity and depth of the wound can be assessed using the Wagner scale (Shah P. et

Case Illustration/Description: Case 1: Wagner Scale 3 Diabetic Ulcer (Deep ulcer with pus) Patient Identity Name: Mr. R Age: 41 years Gender: Male Occupation: - Case 2:

Wagner Scale 3 Diabetic Ulcer (Deep ulcer with pus) Patient Identity Name: Mrs. M Age: 54 years Gender: Female Occupation: - Medical History: Type 2 Diabetes Mellitus (DM), Sepsis, unspecified organism, Abnormality of albumin Case 3 : Wagner Scale 3 Diabetic Ulcer (Deep ulcer with pus) Patient Identity Name: Mrs. C Age: 56 years Gender: Female Occupation: - Medical History: Type 2 Diabetes Mellitus (DM). Case 4 : Wagner Scale 3 Diabetic Ulcer (Deep ulcer with pus) Patient Identity Name: Mr. M Age: 54 years Gender: Male Occupation: - Medical History: Type 2 diabetes mellitus ,Cutaneous abscess of right foot. Case 5 : Wagner Scale 3 Diabetic Ulcer (Deep ulcer with pus) Patient Identity Name: Mr. ML Age: 50 Gender: Male Occupation: - Medical History: Type 2 diabetes mellitus,

Conclusion: Age, gender, and comorbidity factors influence the Wagner scale of patients with Diabetic Foot.

Keywords: Diabetic Foot, Wagner Scale, Gender, Age, Sex

Delayed Sternal Closure Duration and Infectious Complications after Pediatric Congenital Heart Surgery: A Systematic Review

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Background/Introduction: Delayed sternal closure is a postoperative strategy in pediatric cardiac surgery to prevent cardiac complications; however, it carries a risk of postoperative infection. Currently, the evidence related to risk factors, the optimal time for closure, and protocols to prevent infections remains unclear.

Objectives: This study aims to systematically identify predictors of infection, optimal time for closure, and prevention strategies to improve clinical outcomes in infants undergoing cardiac surgery.

Method: The database search was conducted using PubMed, Scopus, and Cochrane library databases in April 2026. Eligible studies included randomized controlled trials, cohort, cross-sectional, and case-control studies related to timing or duration of delayed sternal or chest closure and reported at least one postoperative infectious outcome in children aged 0–18 years. Quality assessment was

performed using Newcastle–Ottawa Scale for observational study and Joanna Briggs Institute (JBI) for case reports.

Result: Out of 393 identified records, 16 studies met inclusion criteria. Most were retrospective studies involving neonates or infants undergoing complex congenital cardiac surgery. Definitions of delayed sternal closure duration and infectious outcomes varied substantially. Several studies suggested higher infectious morbidity with prolonged open–sternum duration, particularly beyond 4–5 days, while others found infection risk to be more closely related to illness severity, extracorporeal membrane oxygenation, repeated sternal reopening, prolonged ventilation, and invasive device exposure. The largest multicenter cohort reported infectious complications in 18.7% of patients.

Conclusion: Delayed sternal closure is an essential strategy in high-risk pediatric congenital heart surgery, but infection risk appears greater when open–chest management is prolonged, repeated, or associated with severe physiologic instability. Current evidence does not support a universal closure–time threshold, highlighting the need for standardized infection definitions and prospective studies.

Keywords: Delayed sternal closure; Pediatric cardiac surgery; Congenital heart disease; Postoperative infection; Open chest management

SYSTEMATIC REVIEW: Artificial Intelligence–Based Electrocardiogram for Predicting Postoperative Atrial Fibrillation after Adult Cardiac Surgery

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Background/Introduction: Postoperative Atrial Fibrillation (POAF) is the most frequent complication following cardiac surgery with rates up to 50%, associated with increased mortality, morbidity, prolonged hospitalization, and elevated healthcare costs. Existing risk scores have limited accuracy, necessitating more accurate prediction models. Advances in artificial intelligence (AI) applied to electrocardiogram (ECG) offer a promising opportunity to predict POAF more accurately than existing scores.

Objectives: This systematic review aimed to evaluate the predictive performance of AI–ECG models for predicting POAF after adult cardiac surgery.

Method: PubMed, EMBASE, and IEEE Xplore were searched up to June 2026 for studies applying AI–based ECG methods to predict POAF in adults undergoing cardiac surgery. Data extraction and risk of bias assessment were performed independently. Five studies were included (total 30,163 patients).

Result: AI–based ECG models demonstrated consistent predictive performance for POAF after adult cardiac surgery across all five studies. Highest numerical values were reported in smaller studies (N: 100–106); a clinical–ECG model using P–wave parameters achieved AUC 0.892 and a support vector machine using long–term single lead ECG achieved AUC 0.89. In a larger study (N: 27,564), a deep learning model achieved C–statistic of 0.83 with negative predictive value of 99%, demonstrating reliable screening capability. Moreover, one AI–ECG model showed independent additive value when combined with existing clinical scores, improving AUROC from 0.643 to 0.710. Notably, a deep neural network further confirmed risk stratification utility, with POAF rates within three months significantly higher in high–risk versus low–risk groups (40.4% vs 21.4%, hazard ratio 2.2).

Conclusion: AI–ECG models demonstrate promising predictive performance for POAF after adult cardiac surgery. A deep learning model using preoperative 12–lead ECG showed the most reliable and generalizable performance. External validation in larger multicenter prospective studies is warranted before clinical implementation.

Keywords: AI–ECG; POAF; cardiac surgery; deep learning; risk stratification

Delayed Manifestation of Open Pneumothorax in Pediatric Penetrating Thoracic Trauma: A Case Report

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Background: Pediatric thoracic trauma is an uncommon case, accounting for only 4–10% of pediatric trauma cases, but it is associated with considerable morbidity and mortality rates. Despite minimal clinical manifestations due to a highly compliant pediatric chest wall, significant

intrathoracic injuries may occur. A normal initial chest X-ray does not rule out significant thoracic injury, including a pneumothorax. This case report presents a delayed manifestation of open pneumothorax in a 14-year-old boy, highlighting the importance of serial reassessment and repeat imaging in penetrating chest trauma.

Case Illustration/Description: A 14-year-old boy was admitted with a penetrating left hemithorax injury. Initial assessment revealed a hemodynamically stable patient without respiratory distress or an apparent sucking chest wound. The initial chest X-ray showed no evidence of pneumothorax. To manage active bleeding, the wound was temporarily covered with an occlusive dressing. Repeat clinical evaluation prior to definitive wound exploration identified a sucking chest wound, and a repeat chest X-ray confirmed a partial pneumothorax. A three-sided occlusive dressing was applied, followed by water seal drainage (WSD). Wound exploration confirmed a complete ninth rib fracture requiring operative management with open reduction and internal fixation. The patient recovered and was discharged without complications.

Conclusion: Delayed manifestation of open pneumothorax may occur in pediatric penetrating thoracic trauma despite the absence of signs on initial clinical assessment and chest X-ray. Therefore, serial clinical reassessment and repeat chest imaging are essential in anticipation of the evolution of wound characteristics or respiratory findings to enable timely diagnosis and definitive management.

Keywords: penetrating thoracic trauma; open pneumothorax; sucking chest wound; pediatric thoracic trauma

Early Versus Delayed Extubation After Pediatric Cardiac Surgery: An Updated Systematic Review

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Background/Introduction: Mechanical ventilation is routinely used after pediatric cardiac surgery to support postoperative cardiorespiratory stability. Prolonged exposure to mechanical ventilation increases the risk of ventilator-associated complications, diaphragmatic

atrophy, and hospital resource consumption. While fast-track cardiac anesthesia and Enhanced Recovery After Surgery (ERAS) protocols advocate for early extubation, concerns persist regarding the safety of immediate ventilator liberation, potential respiratory collapse, and the risk of reintubation in hemodynamically vulnerable children.

Objectives: The primary objective of this systematic review was to evaluate whether early extubation (defined as tracheal extubation performed within 24 hours postoperatively, including immediate on-table extubation) compared with delayed extubation (greater than 24 hours postoperatively) improves clinical and resource outcomes in pediatric cardiac surgical patients.

Method: Electronic databases MEDLINE (via PubMed), OpenAlex, and Europe PMC, were searched for studies published from April 2024 to recent index dates, supplemented by manual forward and backward citation screening. A narrative synthesis was conducted due to substantial clinical heterogeneity in patient age, surgical complexity, and extubation protocols across the primary studies. Findings were structured and compared using qualitative synthesis and detailed data extraction tables.

Result: Four studies representing a total of 550 pediatric cardiac patients met the eligibility criteria. Early extubation, including immediate on-table extubation, was associated with significant reductions in ICU stay (ranging from 1.2 to 1.9 days in fast-track cohorts compared to 4.0 to 9.4 days in conventional/delayed cohorts) and hospital stays (6.0 to 6.4 days vs. 7.9 to 12.0 days).

Conclusion: Early extubation within 24 hours postoperatively is highly feasible and safe in select pediatric cardiac surgical patients, facilitating accelerated recovery without increasing the risk of mortality or reintubation. Incorporating objective, weight-adjusted physiological metrics into protocolized spontaneous breathing trials is recommended to improve the assessment of extubation readiness and minimize extubation failure.

Keywords: Heart Defects, Pediatrics cardiac surgery, Early Extubation, Late Extubation, Length of Stay

Efficacy and Safety of Inner-Branched Endografts for Complex Aortic Aneurysms: A Systematic Review

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Background/Introduction: Inner-branched endografts have emerged as a promising endovascular option for the treatment of complex abdominal and thoracoabdominal aortic aneurysms. Despite their increasing clinical use, evidence regarding their efficacy and safety remains limited, and no comprehensive synthesis of contemporary studies is currently available.

Objectives: To evaluate the efficacy and safety of inner-branched endografts in the endovascular treatment of complex abdominal and thoracoabdominal aortic aneurysms.

Method: This systematic review was conducted in accordance with the PRISMA 2020 guidelines. A systematic search of PubMed, ScienceDirect, and the Cochrane Library was performed to identify studies published between 2021 and 2026. Observational studies and prospective registries evaluating inner-branched endografts in patients with complex abdominal or thoracoabdominal aortic aneurysms were eligible for inclusion. The primary efficacy outcomes were technical success, clinical success, and target vessel (TV) success/patency. Safety outcomes included 30-day mortality, endoleak, spinal cord ischemia (SCI), stroke, acute kidney injury (AKI), and reintervention.

Result: Seven studies involving 317 patients met the inclusion criteria, comprising five retrospective cohort studies and two prospective multicenter registries. Sample sizes ranged from 18 to 116 patients, with follow-up durations ranging from 90 days to a median of 22.8 months. Technical success ranged from 89.5% to 100%, while clinical success, reported in five studies, ranged from 73.7% to 100%. Target vessel success ranged from 95.1% to 100%, with target vessel patency ranging from 93.5% to 100%. Thirty-day mortality ranged from 0% to 15.8%. Type IA, IB, IC, II, and III endoleaks were reported, with type II and III endoleaks being the most frequently observed. The incidence of SCI ranged from 0% to 11.1%, stroke from 0% to 6%, AKI from 2.2% to 8.6% (when reported), and reintervention from 4.5% to 16%.

Conclusion: Inner-branched endografts demonstrated favourable technical success, target vessel patency, and acceptable early safety for complex aortic aneurysms.

Keywords: inner-branched endograft; thoracoabdominal aortic aneurysm; pararenal abdominal aortic aneurysm; endovascular aneurysm repair; branched endovascular repair

The Distal Burden of Dissection: When Peripheral and Lower Extremity Malperfusion Complicate Acute Type A Aortic Dissection — A Systematic Review and Meta-Analysis

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Background/Introduction: Lower extremity and peripheral malperfusion are common manifestations of acute type A aortic dissection (ATAAD) and may indicate extensive dissection with systemic end-organ ischemia. However, unlike cerebral and mesenteric malperfusion, their prognostic impact on postoperative outcomes remains unclear because available evidence is limited and heterogeneous. This systematic review and meta-analysis aimed to evaluate the association between peripheral/lower extremity malperfusion and postoperative outcomes in ATAAD.

Objectives: To evaluate the association between lower extremity and peripheral malperfusion and adverse postoperative outcomes in patients undergoing surgical repair of ATAAD.

Method: A systematic review and meta-analysis following the PRISMA 2020 guidelines was conducted using PubMed, Scopus, and the Cochrane Library. Studies evaluating the association between peripheral or lower extremity malperfusion and clinical outcomes in patients with acute type A aortic dissection were included. Mortality was the primary outcome, while pulmonary complications, stroke, and renal replacement therapy (RRT) were secondary outcomes. Pooled odds ratios (ORs) with 95% confidence intervals (CIs) were calculated using random-effects

models for studies with extractable crude event data. Adjusted effect estimates were synthesized using the generic inverse variance method.

Result: Eight studies involving 12,778 patients were included. Lower extremity/peripheral malperfusion was associated with significantly higher rates of pulmonary complications (OR 1.86, 95% CI 1.19–2.91). Trends toward increased mortality (OR 1.35, 95% CI 0.71–2.57), stroke (OR 1.46, 95% CI 0.85–2.49), and renal replacement therapy (OR 1.64, 95% CI 0.53–5.05) were observed. In pooled adjusted analyses from large registry studies, peripheral/extremity malperfusion independently predicted mortality (adjusted OR 1.46, 95% CI 1.25–1.71).

Conclusion: Lower extremity and peripheral malperfusion are associated with worse outcomes in acute type A aortic dissection. Although pooled mortality did not reach statistical significance, increased postoperative morbidity and higher adjusted mortality suggest that distal malperfusion reflects more extensive disease and identifies a subgroup of ATAAD patients at particularly high risk.

Keywords: Acute Type A Aortic Dissection; Malperfusion Syndrome; Lower Extremity Malperfusion; Peripheral Malperfusion; Meta-Analysis

Chest Wall Reconstruction After Resection: A Systematic Review of Biologic, Synthetic, and Titanium-Based Materials and Their Impact on Surgical Outcomes

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Background/Introduction: Chest wall reconstruction remains a challenging procedure in thoracic surgery, requiring restoration of chest wall stability while minimizing postoperative complications. A variety of biologic, synthetic, and titanium-based materials have been introduced into clinical practice; however, the optimal reconstructive material remains uncertain and evidence comparing available options remains limited.

Objectives: To synthesize current evidence on chest wall reconstruction materials and their association with postoperative complications, reconstruction durability, and clinical outcomes.

Method: A systematic search was performed in PubMed, Scopus, ScienceDirect, and the Cochrane Library. Studies involving adult patients undergoing chest wall reconstruction using biologic, synthetic, prosthetic, or titanium-based materials were included. Primary outcomes were surgical site infection, reconstruction failure, explantation, and major complications. Secondary outcomes included reoperation, respiratory complications, length of stay, chest wall stability, and pain.

Result: Of 1,385 records identified, 17 studies met the inclusion criteria. Reconstruction strategies included biologic meshes, synthetic prostheses, titanium-based implants, ceramic prostheses, and hybrid techniques. Biologic materials generally demonstrated favorable outcomes in contaminated or high-risk settings, with low rates of infection-related explantation. Titanium-based reconstructions provided reliable structural support and excellent chest wall stability, particularly for extensive defects. Reconstruction failure was uncommon, and prosthesis removal rates were typically below 10%. Larger defects, sternal involvement, and extensive rib resections appeared to contribute more to postoperative morbidity than the reconstruction material itself. No single material consistently outperformed all others across every clinical scenario.

Conclusion: Current evidence suggests that successful chest wall reconstruction depends on matching the reconstruction strategy to the characteristics of the defect rather than relying on a universally superior material. Biologic materials may be advantageous in contaminated fields, synthetic materials remain a practical option with acceptable outcomes, whereas titanium-based systems offer durable support for complex reconstructions. Further comparative studies are needed to guide evidence-based material selection.

Keywords: Chest wall reconstruction; Thoracic surgery; Biologic mesh; Titanium implants; Surgical Outcomes

Multiple Arterial Versus Single Arterial Grafting in Patients With Diabetes Undergoing Coronary

Artery Bypass Grafting: A Systematic Review and Meta-Analysis

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Background/Introduction: In patients with diabetes undergoing coronary artery bypass grafting (CABG), conduit selection is a consequential surgical decision: multiple arterial grafting (MAG) may improve long-term survival, but bilateral internal thoracic artery strategies may increase deep sternal wound infection (DSWI).

Objectives: To determine whether MAG, compared with single arterial grafting (SAG) or venous-conduit strategies, is associated with lower mortality in diabetic CABG patients, while defining the accompanying DSWI trade-off.

Method: We conducted a systematic review and tiered meta-analysis according to PRISMA 2020 principles. PubMed/MEDLINE, Scopus, and the Cochrane Library/CENTRAL were searched on June 2026. Comparative and contextual studies in adults with diabetes undergoing CABG were organized into four evidence tiers: main efficacy, safety-only, patency, and supplementary narrative evidence. The primary synthesis used diabetic-specific adjusted or propensity-matched estimates for long-term all-cause mortality. Safety was analyzed separately using diabetic-specific exact-count DSWI data. Random-effects models were used. Risk of bias and certainty were assessed using standard frameworks.

Result: Fifteen reports were included. Three observational cohorts contributed to the primary mortality synthesis. MAG or additional arterial conduit strategies were associated with lower long-term all-cause mortality compared with SAG or venous-conduit strategies (pooled HR 0.72; 95% CI 0.63–0.83; $I^2 = 0\%$; $k = 3$). Three safety cohorts suggested higher DSWI risk with bilateral internal thoracic artery-oriented strategies (pooled RR 1.78; 95% CI 1.21–2.60; $I^2 = 0\%$; $k = 3$). Patency and supplementary evidence supported arterial durability and technique-based risk mitigation but were not pooled with mortality.

Conclusion: In diabetic CABG patients, current evidence favors consideration of MAG as a long-term survival-

oriented conduit strategy. Although bilateral internal thoracic artery-oriented approaches showed a DSWI signal, this should inform risk-tailored conduit selection and technique optimization rather than preclude MAG use. Because certainty is limited by nonrandomized design and conduit-selection bias, further comparative trials are needed.

Keywords: coronary artery bypass grafting; diabetes mellitus; multiple arterial grafting; deep sternal wound infection; systematic review and meta-analysis

Association of Venous Leg Ulcer Status With Symptom-Related Readmission After Endovenous Laser Ablation for Chronic Venous Insufficiency: A Single-Center Retrospective Cohort Study

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Background/Introduction: Venous leg ulcer (VLU) represents advanced chronic venous insufficiency (CVI) and may be associated with persistent symptom burden after venous intervention. Endovenous laser ablation (EVLA) is widely used to treat superficial venous reflux, but real-world data on unplanned symptom-related readmission after EVLA according to VLU status remain limited.

Objectives: To evaluate whether VLU status was associated with unplanned symptom-related readmission after index EVLA among patients with CVI.

Method: This retrospective cohort study included 488 unique index EVLA admissions at RSA UGM, Yogyakarta, Indonesia, from January 2022 to May 2026. VLU was defined as CEAP C5–C6, and non-VLU was defined as CEAP C2–C4. The primary outcome was unplanned symptom-related readmission after index EVLA. Readmission proportions were compared by VLU status. Logistic regression was used to estimate crude and minimally adjusted odds ratios (ORs), with adjustment for age greater than or equal to 60 years and biological sex.

Result: Among 488 patients, 141 (28.9%) had VLU and 347 (71.1%) were non-VLU. Unplanned symptom-related readmission occurred in 15 patients (3.1%). Readmission occurred in 6/141 VLU patients (4.3%) and 9/347 non-VLU patients (2.6%; Fisher exact $p=0.386$). In crude analysis, VLU status was not significantly associated with readmission (OR 1.67, 95% CI 0.58–4.78; $p=0.340$). After adjustment for age greater than or equal to 60 years and biological sex, VLU status remained not significantly associated with readmission (adjusted OR 1.61, 95% CI 0.56–4.69; $p=0.379$). Median time to first readmission was 158 days (IQR 77–443).

Conclusion: Symptom-related readmission after EVLA was rare (3.1%) regardless of VLU status. While VLU patients showed a trend toward higher readmission, no statistically significant association was observed after adjustment. These findings suggest a favorable real-world post-procedural readmission profile of EVLA even in advanced CVI and highlight the need to identify other clinical determinants of post-procedural readmission beyond VLU status alone.

Keywords: chronic venous insufficiency; venous leg ulcer; endovenous laser ablation; symptom-related readmission; retrospective cohort study

Staged Percutaneous Transluminal Angioplasty for Young-Onset Bilateral Chronic Limb-Threatening Ischemia With Suspected Thrombotic Component: A Case Report

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Background: Young-onset bilateral chronic limb-threatening ischemia (CLTI) is diagnostically challenging because uncommon etiologies must be considered while timely revascularization is required to relieve ischemia and avoid limb loss. We report staged percutaneous transluminal angioplasty (PTA) for bilateral CLTI with suspected thrombotic component and undetermined etiology.

Case Illustration/Description: A 27-year-old man presented with bilateral CLTI, prior right foot minor amputation, right foot tissue loss, and progressive ischemic symptoms. Before intervention, he had a smoking history and later achieved smoking cessation. Computed tomography angiography (CTA) demonstrated long-segment total occlusion of the right superficial femoral artery, approximately 20.27 cm, with distal collateral reconstitution, and left superficial femoral artery occlusion, approximately 32.66 cm, with slow distal collateral filling. Based on these, the femoropopliteal lesions were classified as TransAtlantic Inter-Society Consensus II (TASC II) D. No diabetes mellitus, chronic kidney disease, hypertension, autoimmune disease, known thrombophilia, embolic source, upper-extremity involvement, migratory thrombophlebitis, or family history of similar disease was identified. The patient underwent staged PTA. Right PTA documented mid superficial femoral artery chronic total occlusion with multiple collaterals and suspected adherent hard thrombus. Plain balloon angioplasty improved stenosis and distal flow without dissection or perioperative complication. Left PTA involved successful lesion crossing to the popliteal segment and plain balloon angioplasty below and above the knee, with improved stenosis and flow and no documented dissection, thrombus, or perioperative complication. During 1–2 weeks of follow-up, all documented clinical follow-up criteria improved, including ischemic symptoms, limb warmth, mobilization, wound-care assessment, smoking cessation, and absence of major amputation.

Conclusion: This case illustrates staged technically successful PTA for young-onset bilateral CLTI with TASC II D femoropopliteal lesions, undetermined etiology, and suspected thrombotic component. The key learning point is that endovascular revascularization can be considered in a limb-salvage-oriented strategy for anatomically complex disease, while missing severity classification and objective perfusion metrics should be reported transparently.

Keywords: chronic limb-threatening ischemia; percutaneous transluminal angioplasty; superficial femoral artery occlusion; young adult; case report

Successful Mechanical Mitral Valve Replacement in Rheumatic Heart Disease with Wall-to-Wall Heart: A Rare Case Report

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Background: Rheumatic heart disease (RHD) patients are
predominantly female (64.4%) with mitral valve (MV) lesions
(70.8%). The untreated MV lesion may lead to vicious cycle
and eventual cardiomegaly which may progress into wall-
to-wall cardiomegaly. This condition is rare and poses
challenges in surgical valve management.

Leveling Up Surgical Standards: Can Enhanced Recovery After Surgery Protocols Bridge the Gap in Cardiovascular and Thoracic Care?

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Background/Introduction: Enhanced Recovery After
Surgery (ERAS) protocols have transformed perioperative
care by minimizing surgical stress and accelerating patient
recovery. Despite proven benefits in other surgical fields,
implementation across cardiovascular and thoracic
surgery remains inconsistent, with high-quality randomized
controlled trial evidence still limited relative to observational
data, creating uncertainty in standardized clinical adoption.

Objectives: This systematic review aims to evaluate the
effectiveness of ERAS protocols in improving clinical
outcomes and to assess their potential to bridge the
evidence and implementation gap between cardiovascular
and thoracic surgical practices.

Method: A systematic search was conducted across
PubMed and Scopus for randomized controlled trials and
systematic reviews published between 2022 and 2026,
focusing on ERAS implementation, perioperative care
bundles, and clinical outcomes. Data extraction and quality
assessment were performed independently by the authors.

Result: In cardiac surgery, comparative data indicate that
ERAS implementation consistently reduces hospital length
of stay by 1.2–1.4 days and intensive care unit stay by
approximately 13 hours, effectively optimizing resource
allocation without compromising patient safety. In thoracic
surgery, ERAS adoption correlates with a significant
reduction in pulmonary complications, most notably
following minimally invasive procedures, demonstrating
superior clinical maturation compared to cardiac
subspecialties. Systematic mapping of institutional
guidelines reveals that despite the growing evidence base,
a notable “standardization gap” persists, characterized by
high variability in care-bundle adherence across different
clinical settings.

Conclusion: ERAS protocols serve as a powerful catalyst for
elevating surgical quality, yet their full clinical impact is
currently hindered by inconsistent implementation. Our
findings emphasize that closing the implementation gap is
as critical as advancing the surgical techniques
themselves. By transitioning from observational data to
robust, multicenter randomized controlled trials,
cardiovascular and thoracic centers can establish a unified,
evidence-based standard that bridges the current divide in
surgical outcomes.

Keywords: Enhanced Recovery After Surgery,
Cardiovascular and Thoracic Surgery, Length of Stay,
Quality Improvement, Clinical Outcomes

True Thymic Hyperplasia Mimicking Thymoma in a Child with Myasthenia Gravis : A Case Report

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Background: Anterior mediastinal mass in the pediatric
population is rare, with thymoma comprising less than 1% of
all pediatric mediastinal tumors. Its coexistence with
Myasthenia Gravis (MG) in this age group is exceptionally



uncommon. True Thymic Hyperplasia (TTH) characterized by diffuse thymic enlargement with preserved normal histoarchitecture — is a distinct entity that may closely mimic thymoma both clinically and radiologically, posing a significant diagnostic challenge.

Case Illustration/Description: A 12-year-old girl presented with recurrent productive cough and fatigable weakness suggestive of MG. Subsequently, a neostigmine test confirmed MG; pyridostigmine was initiated. Contrast-enhanced CT identified a triangular homogeneously enhancing lesion measuring 3.2×2.0×7.8 cm in the anterior mediastinum, adherent to the left brachiocephalic vein, encasing the ascending aorta, pulmonary trunk, and anterior pericardium. Following MDT discussion, median sternotomy with extended thymectomy was performed, as vascular encasement precluded minimally invasive resection per STS 2024 consensus. Complete resection (R0) was achieved; the mass was adherent to the pericardium and innominate vein intraoperatively. Histopathology revealed follicular hyperplasia, cortical immature T-cell predominance, and Hassall corpuscles, raising the differential of Thymoma B1. A targeted immunohistochemistry (IHC) panel universally negative, confirming True Thymic Hyperplasia and excluding thymoma.

Conclusion: TTH masquerading as thymoma in a pediatric MG patient represents an extraordinarily rare diagnostic challenge. Contrast-enhanced CT is essential for anatomical delineation but cannot reliably differentiate TTH from thymoma. Extended thymectomy via median sternotomy is the procedure of choice when vascular encasement precludes safe minimally invasive approaches. A targeted IHC panel is the indispensable final arbiter — universally negative epithelial markers confirm TTH and spare the patient unnecessary adjuvant therapy. Multidisciplinary collaboration among thoracic surgery, pediatric neurology, anatomical pathology, and anesthesiology is critical for optimal outcomes.

Keywords: true thymic hyperplasia; pediatric thymoma; extended thymectomy; myasthenia gravis; mediastinal mass

Surviving a rare airway catastrophe: complete bronchial transection with tension pneumothorax following blunt thoracic injury

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Background: Tracheobronchial injury, particularly complete bronchus transection, is a rare but life-threatening complication of blunt thoracic injury. Delayed diagnosis is common because of its nonspecific presentation; however, radiographic findings may facilitate early recognition and timely and appropriate intervention. We report an extremely rare case of complete right main bronchus transection following blunt thoracic injury.

Case Illustration/Description: A 25-year-old man who presented with severe respiratory distress following blunt thoracic injury. Chest X-ray demonstrated a right-sided 'fallen lung sign', tension pneumothorax, extensive subcutaneous emphysema, left pulmonary contusion, and multiple rib fractures. Emergency tube thoracostomy was performed, followed by emergency thoracotomy because of persistent respiratory distress. Intraoperative findings revealed complete transection of the right main bronchus with total collapse of the right lung. Primary end-to-end right main bronchus anastomosis was successfully performed. The right lung was fully re-expanded and underwater saline leak test confirmed an airtight anastomosis. Postoperatively, he developed severe acute respiratory distress syndrome (ARDS) and remained dependent on mechanical ventilation, with successful weaning achieved on postoperative day 11, and the right chest tube was removed on postoperative day 12. Follow-up chest radiography demonstrated re-expansion of the right lung without pneumothorax.

Conclusion: This case report presents a rare clinical entity of complete bronchus transection after blunt thoracic injury. Persistent pneumothorax after insertion of tube thoracostomy should raise suspicion for major tracheobronchial injury. Early recognition, prompt surgical

repair, and multidisciplinary management are crucial for achieving favorable outcomes.

Keywords: acute respiratory distress syndrome; complete bronchus transection; fallen lung sign; tension pneumothorax; tracheobronchial injury

Main Risk Factors for Junctional Ectopic Tachycardia Incidence following Tetralogy of Fallot Repair Surgery: A Systematic Review

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Background/Introduction: Junctional ectopic tachycardia (JET), a life-threatening arrhythmia, often occurs following cardiac surgeries, mainly Tetralogy of Fallot (TOF) repair.

Objectives: This study aims to review the main risk factors for JET following TOF repair.

Method: Referring to Preferred Reporting Items for Systematic Review and Meta-analyses (PRISMA) guideline 2020, literature search was performed on Pubmed, Science Direct, CENTRAL, and Google Scholar for articles examining risk factors of JET following TOF repair published in 2016–2026. Non-original research, non-accessible full texts, or studies in languages other than English or Indonesian were excluded. The data were extracted in a table, with the significance of preoperative, intraoperative, and postoperative parameters in triggering JET analysed narratively. Risk-of-bias was assessed using Risk Of Bias In Non-randomized Studies of Interventions (ROBINS-I) 2025.

First successful upper arm replantation in a resource-limited setting: a case report

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Background: Replantation is the surgical reattachment of the amputated limb through restoration of neurovascular and musculoskeletal structures to recover both form and function. Arm amputation is a devastating injury associated with functional impairment. We present a first case of successful upper arm replantation performed at out hospital, highlighting amputated limb preservation, surgical management, and postoperative rehabilitation.

Case Illustration/Description: A 32-year-old man presented 2 hours after a complete traumatic amputation of left upper arm caused by a crush-traction-avulsion injury. The amputated limb was irrigated with 0.9% normal saline, sealed in multiple airtight plastic bags, and preserved on ice during transfer. Emergency replantation surgery was performed under general anesthesia. Arterial reconstruction using a saphenous vein graft was prioritized and completed within 2 hours, resulting in immediate restoration of limb perfusion, followed by venous reconstruction. He was transferred to the intensive care unit (ICU) and rehabilitation was initiated on postoperative day 3 with immobilization, gentle passive range-of-motion exercise, electrical stimulation, limb elevation, and progressive functional training. Electromyography was performed to assess the recovery of nerve following replantation.

Conclusion: This case demonstrates that appropriate limb preservation, timely revascularization, multidisciplinary collaboration, and comprehensive postoperative rehabilitation can contribute to successful upper arm replantation and favorable functional outcomes.

Keywords: Cold Ischemia; Limb replantation; Rehabilitation; Vascular Anastomosis

Chest Wall Reconstruction After Sternal Resection for Tuberculosis Mimicking Tumour Using Autologous Rib Grafts and Plate Fixation: A Technical Report

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Background: Primary sternal tumours are exceedingly rare but present major oncologic and reconstructive challenges. Notably, not all sternal lesions represent malignancy. Infectious etiologies, particularly tuberculosis, may involve the sternum and mimic neoplastic processes. Accordingly, sternal reconstruction must restore chest wall rigidity, prevent paradoxical motion, and preserve pulmonary function. Available options were varies, with selection tailored to defect geometry, tumour extent, and patient factors

Case Illustration/Description: A 28-year-old man with mid-sternal chest mass that had been present for the previous 2 months, gradually increased in size, denied any prior history of trauma, felt pressure when lying supine, denied having dyspnea, fever, weight loss, or activity-related weakness. A fixed, firm, non-fluctuant mass measuring approximately 5 × 8 cm was palpated over the sternal region. Thoracic CT demonstrated destructive lytic lesion involving anterior to right lateral aspect of the sternal body, accompanied by bulging soft-tissue mass at the level of the right second to third intercostal spaces. The mass appeared adherent to the right second and third costochondral junction, with partially ill-defined borders, without apparent infiltration into the manubriosternal joint. During surgery, solid tumour mass was identified in the sternal region, measuring approximately 7 × 5 cm, had irregular margins, with destruction of the sternum at the involved area, and was adherent to the bilateral second and third costal cartilages. Tumour Resection was done. Right anterolateral seventh rib graft was harvested, cut into two segments to match the defect. Reconstruction was performed using Polypropylene mesh, followed by implantation of two autologous rib grafts with additional fixation using rib plate. Closure of the defect was performed

layer by layer. Histopathological tumour analysis was consistent with tuberculous granulomatous inflammation

Conclusion: Integration of costal grafts with costal plate fixation for sternal reconstruction after resection appears to provide a viable option that can restore chest-wall stability and protect intrathoracic structures

Keywords: Chest Wall Reconstruction ; Chest wall resection; Autologous Rib Grafts ; Titanium rib Plate Fixation ; Sternum tuberculosis

Massive Pleural Effusion as Unusual Extrapulmonary Manifestation of Pyogenic Liver Abscess in a Young Adult Male: A Diagnostic Challenge Mimicking Lung Tuberculosis – A Case Report

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Background: Pleural effusion is a clinical condition with various etiologies, ranging from heart failure, malignancy, to infection. While pulmonary tuberculosis remains a common cause in Indonesia, pyogenic liver abscess is a rare cause of pleural effusion that potentially lethal if left undetected. This case report highlights the importance of investigating extrapulmonary source of pleural effusion.

Case Illustration/Description: A 33-year-old male, presented to emergency room with fever, hemoptysis, and dyspnea for three days. He had more than a 10-years history of tobacco smoking and no prior tuberculosis treatment. He also mentioned history of one-month upper abdominal discomfort, weight loss and decreased appetite. Physical examination showed decreased vesicular breath sounds, decreased vocal fremitus and dull percussion on right hemithorax. Chest X-Ray showed right-side pleural effusion that badly progressed despite five days treatment of Ceftriaxone antibiotic therapy. Mycobacterium tuberculosis was not detected in patient sputum from GeneXpert testing. Anti-Human Immunodeficiency Virus (HIV) and Syphilis tests were non-reactive. Furthermore, contrast-enhanced thoracic Computed Tomography (CT) scan was done to identify the underlying disease. Abscess was found at right

lobe of liver and spread to pleural space through diaphragm. Patient underwent laparotomy surgery to evacuate pus and debridement of necrotic tissue, followed by chest tube insertion on right hemithorax. *Staphylococcus aureus* was identified from pleural pus microbial culture. Chest X-Ray evaluation on five days after surgery showed good improvement of effusion, and patient was discharged following day.

Conclusion: Unilateral pleural effusion with negative GeneXpert should make clinician wary of other source of infection, including uncommon cause such as liver abscess. An accurate diagnostic approach combining physical examination, appropriate radiologic imaging and laboratory testing is important to determine the underlying etiology of pleural effusion. Proper treatment of underlying disease can lead to positive outcome and reduced hospital length of stay.

Keywords: pleural effusion; pyogenic liver abscess; pulmonary tuberculosis; diagnostic challenge;

Bioprosthetic Versus Mechanical Valve: The Dilemma of Mitral Valve Selection in a Young Adult with Infective Endocarditis and Severe Regurgitation: A Clinical Case Report

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Background: Severe mitral regurgitation secondary to infective endocarditis often requires surgical valve replacement. The selection between mechanical and bioprosthetic valves remains a dilemma in young adults, requiring a careful balance between long-term valve durability and the risks associated with lifelong anticoagulation usage. This case report illustrates the decision-making process in a young adult facing this therapeutic dilemma.

Case Illustration/Description: A 45-year-old male presented with a two-month history of recurrent fever. Blood cultures isolated *Enterococcus faecalis*, prompting echocardiographic screening for infective endocarditis (IE). Bedside echocardiography revealed severe mitral

regurgitation (MR) with a massive jet and a suspected perforation in the posterior mitral valve leaflet (PMVL). Transesophageal echocardiography confirmed a 20×15 mm vegetation on the P2 segment of the mitral valve, multiple leaflet perforations (three holes measuring approximately 5 mm each), and severe regurgitation. Following a comprehensive preoperative discussion regarding lifestyle preferences and anticoagulation monitoring accessibility, the patient electively chose a bioprosthetic valve. Intraoperatively, the P2 and P3 segments of the PMVL were found to be completely destroyed, exhibiting multiple perforations, fragile vegetations, and chordal detachment at P3. Mitral valve replacement was successfully executed using a novel bovine pericardial bioprosthetic valve with advanced anti-calcification tissue technology.

Conclusion: Valve selection in young adults remains a complex challenge. While guidelines generally favor mechanical valves for patients under 50 years old due to long-term durability, individual choices must be adjusted through comprehensive shared decision-making. Factors such as patient lifestyle preferences, structural valve deterioration risks, and accessibility to routine international normalized ratio (INR) monitoring are critical. The utilization of advanced bovine tissue technologies offers a promising alternative by providing enhanced durability and eliminating the need for lifelong anticoagulation, thereby respecting patient autonomy without compromising long-term outcomes.

Keywords: Infective endocarditis; Mitral valve replacement; Bioprosthetic valve; Young adults; Shared decision-making

Survival and the Paradox of Valve Durability: A Systematic Review and Meta-Analysis of Bentall versus Valve-Sparing Root Replacement at 10-Year Follow-up

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Background/Introduction: The optimal surgical strategy for aortic root pathology—whether preserving the native valve via Valve-Sparing Root Replacement (VSRR) or replacing it via the Bentall procedure—remains debated.

Objectives: This systematic review and meta-analysis aimed to compare the very long-term durability, survival, and perioperative safety of VSRR versus the Bentall procedure.

Method: A systematic literature search of PubMed, Springer, Scopus, and Cochrane databases was conducted following PRISMA 2020 guidelines to identify comparative studies reporting on VSRR and the Bentall procedure with 10 years or more of follow-up. The primary outcomes were long-term survival, 10-year mortality, and freedom from aortic root/valve reintervention. Secondary outcomes included valve durability (recurrent aortic regurgitation 2+ or greater, or structural valve deterioration), perioperative morbidity, and operative times. Data were pooled using a random-effects model.

Result: Four retrospective cohort studies involving 1,054 patients (VSRR: n=432; Bentall: n=622) were included. Pooled analysis revealed comparable long-term survival (Hazard Ratio [HR] 0.61; 95% Confidence Interval [CI] 0.35–1.06; $P = 0.08$) and 10-year mortality (Odds Ratio [OR] 0.58; 95% CI 0.26–1.31; $P = 0.19$). VSRR demonstrated a borderline significant reduction in reintervention rates (OR 0.53; 95% CI 0.28–1.01; $P = 0.05$), despite being associated with a significantly higher risk of recurrent moderate-to-severe aortic regurgitation (OR 4.10; 95% CI 1.57–10.69; $P = 0.004$). Perioperatively, VSRR was associated with significantly lower risks of acute kidney injury (OR 0.44; $P = 0.008$) and permanent pacemaker implantation (OR 0.31; $P = 0.03$), although it required significantly longer aortic cross-clamp times (Mean Difference 25.69 minutes; $P = 0.01$).

Conclusion: Both VSRR and the Bentall procedure provide excellent and comparable long-term survival. While VSRR requires longer ischemic times and carries a higher risk of recurrent aortic regurgitation, it significantly reduces the incidence of acute kidney injury and pacemaker implantation, without increasing the actual rate of surgical reoperation

Keywords: bental;valve-sparing root replacement; aortic root pathology; long-term follow up

Impact of Complete Versus Partial Subvalvular Apparatus Preservation During Mitral Valve Replacement on Left Ventricular Remodeling and Early Postoperative Outcomes: A Systematic Review and Meta-analysis

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Background/Introduction: Preservation of the subvalvular apparatus during mitral valve replacement (MVR) maintains annular-papillary continuity and helps preserve postoperative left ventricular function. Although partial preservation is commonly performed, whether complete preservation provides additional benefit remains uncertain.

Objectives: To systematically review and meta-analyze complete subvalvular apparatus preservation compared with partial preservation during MVR for left ventricular remodeling and early postoperative outcomes.

Method: PubMed, ScienceDirect, ProQuest, Google Scholar, and EuropePMC were systematically searched following PRISMA guidelines. The outcomes analysis included remodeling-related echocardiographic parameters, namely changes in left ventricular ejection fraction (LVEF), left ventricular (LV) end-systolic and end-diastolic dimensions, fractional shortening, and left atrial (LA) diameter, as well as early postoperative outcomes including atrial fibrillation, low cardiac output syndrome, intensive care unit (ICU) stay, and early mortality. Meta-analysis was performed using Review Manager 5.4 and visualized with forest plots.

Extended Thymectomy Following Perioperative Optimization for Suspected Thymoma in Generalized Myasthenia Gravis Revealing Thymic Involution: A Case Report

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Background: Myasthenia gravis (MG) is frequently associated with thymic pathology requiring different management strategies. Approximately 10% to 20% of MG patients have an associated thymoma; the majority exhibit thymic hyperplasia or involution—the physiological replacement of functional parenchyma with adipose tissue. While thymectomy for nonthymomatous MG primarily aims to achieve neurological remission, surgical resection for thymoma is mandatory to address neoplastic potential and prevent local invasion. Differentiating these entities preoperatively is challenging, as large involuted glands may mimic neoplastic masses on computed tomography (CT). The strategic integration of TPE cycles into both the preoperative and postoperative periods may be associated with early clinical stability, facilitating safe radical resection, and promoting rapid neurological

Case Illustration/Description: A 35-year-old female with early-onset generalized MG presented with an 8-month history of fluctuating ptosis and diplopia. Chest computed tomography (CT) identified an anterior mediastinal mass suggestive of a thymoma. Preoperative evaluation revealed an MG Composite score of 7. One cycle of preoperative TPE was administered to stabilize the neuromuscular status. The patient subsequently underwent extended thymectomy via sternotomy for R0 resection of the large mass. The patient received two additional cycles of postoperative TPE. Recovery was rapid, with complete resolution of ptosis and an improvement in the MG Composite score to 4 by the eighth postoperative day. Final histopathological examination confirmed thymic involution with significant adipose replacement and no signs of malignancy. At 17-day follow-up, the patient remained clinically stable and capable of independent mobilization.

Conclusion: This case highlights the value of perioperative optimization, including therapeutic plasma exchange in facilitating safe extended thymectomy and favorable early

neurological recovery, even when a presumed thymoma is ultimately diagnosed as thymic involution.

Keywords: Myasthenia Gravis; Thymic Involution; Extended Thymectomy; Therapeutic Plasma Exchange; Mediastinal Mass

Drug-Coated Balloon versus Plain Old Balloon Angioplasty for Infrapopliteal Artery Disease: A Meta-Analysis of Contemporary Randomized Controlled Trials

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Background/Introduction: Peripheral arterial disease (PAD) is a progressive atherosclerotic disease associated with substantial morbidity, mortality, and risk of limb loss. Below-the-knee (BTK) lesions are particularly common in patients with chronic limb-threatening ischemia, making endovascular revascularization the mainstay of treatment. Although plain old balloon angioplasty (POBA) remains the standard approach, its long-term effectiveness is limited by high rates of restenosis and repeat revascularization. Drug-coated balloons (DCBs) have emerged as a promising alternative by reducing neointimal hyperplasia without leaving a permanent implant. However, randomized controlled trials (RCTs) have reported inconsistent findings regarding their efficacy and safety.

Objectives: To evaluate the efficacy and safety of DCBs versus POBA in BTK PAD based on RCTs (2021–2026), focusing on target lesion revascularization (TLR), amputation-free survival (AFS), and wound healing rate.

Method: In June 2026, a systematic search of PubMed, Scopus, Wiley, ProQuest, and Nature identified RCTs comparing DCBs and POBA for BTK PAD. Following PRISMA guidelines and the PICO framework, pairwise meta-analyses were performed for target lesion revascularization (TLR), amputation-free survival (AFS), and wound healing rate using Meta-Analysis Online. Risk of bias was assessed using the Cochrane Risk of Bias (RoB) 2 tool.

Result: Five RCTs were included. Meta-analysis showed Drug-Coated Balloons (DCB) significantly reduced Target Lesion Revascularization (TLR) versus Plain Old Balloon

Angioplasty (POBA) (RR=0.80; 95% CI: 0.65–0.99; P=0.0379; I²=0.0%). Conversely, Amputation-Free Survival (AFS) yielded no overall difference (RR=0.97; 95% CI: 0.58–1.61; P=0.8976) with severe heterogeneity (I²=86.9%), driven by contrasting findings between Fransson et al. (RR=1.26) and Patel et al. (RR=0.75). This divergence correlates with a high baseline diabetes (94%) and dialysis (>50%) burden in the outlier trial. Pooled wound healing rates were statistically comparable (RR=0.92; 95% CI: 0.70–1.20; P=0.5346; I²=0.0%).

Conclusion: DCB significantly reduces infrapopliteal revascularization. However, global amputation-free survival and wound healing are comparable, with benefits tightly dependent on patient-specific diabetes and dialysis status.

Keywords: Peripheral Arterial Disease; Below-The-Knee; Drug-Coated Balloon; Plain Old Balloon Angioplasty; Endovascular Therapy

Systemic Inflammatory Response Index as Prognostic Biomarker for Mortality following Cardiac Surgery : A Comprehensive Systematic Review

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Background/Introduction: Coronary atherosclerosis, alongside with its comorbidities, appear as a critical issue for mortality worldwide. Overreaction of the inflammatory biomarkers appeared as indicator for worse long-term prognosis. Novel indices emerged as reliable tools for prognostic purpose.

Objectives: We aimed to investigate systemic inflammatory response index (SIRI) as postoperative predictors following cardiac surgery.

Method: Electronic searching were conducted from inception up to April 17th 2026 on PubMed, Scopus, ProQuest, Web of Science, and ScienceDirect using MeSH terms and its

synonym in conjunction with manual searching. Studies reporting perioperative outcome following any cardiac surgery along with the SIRI index (Neutrophil*Monocyte/Lymphocyte count) were included, subsequently underwent quantitative analysis, with primary outcome of this review was mortality.

Postoperative Lactate and Lactate Clearance as Prognostic Markers of Outcomes After Pediatric Cardiac Surgery: A Systematic Review and Meta-analysis

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Background/Introduction: Pediatric cardiac surgery remains a high-stakes procedure, where postoperative morbidity and mortality continue to be a primary concern for clinicians. Standard hemodynamic monitoring and traditional risk-scoring systems are often insufficient to accurately predict outcomes in the immediate postoperative period within the cardiac intensive care unit. Serum lactate is a well-established indicator of tissue hypoperfusion, while lactate clearance has been proposed as a potentially more reliable prognostic marker than single lactate measurements. However, evidence supporting its prognostic value in pediatric cardiac surgery remains limited and inconsistent.

Objectives: This systematic review and meta-analysis aimed to evaluate the prognostic value of postoperative lactate clearance in predicting mortality and morbidity among children undergoing corrective heart surgery involving cardiopulmonary bypass (CPB).

Method: In June 2026, a systematic search was conducted across PubMed, Scopus, Wiley, ProQuest and Nature to identify cohort studies evaluating postoperative lactate clearance as a predictor of mortality and morbidity in children undergoing cardiac surgery. The search strategy was guided by the PEO framework and the PRISMA flowchart. Key outcomes analysed included mortality, postoperative lactate clearance, preoperative and postoperative lactate levels, cardiopulmonary bypass time, duration of mechanical ventilation, ICU length of stay, and the



incidence of other serious postoperative adverse events. Pairwise meta-analyses were conducted using metaanalysisonline.com website, with risk of bias assessed via QUIPS.

Result: Three cohort studies involving 375 pediatric patients were included. Postoperative lactate was higher in non-survivors (SMD 3.21, 95% CI 0.81–5.61), whereas lactate clearance (SMD 1.10, 95% CI ?3.11 to 5.30) and preoperative lactate (SMD 2.89, 95% CI ?0.16 to 5.95) were not associated with mortality. Non-survivors also had longer cardiopulmonary bypass time (SMD 2.06, 95% CI 1.30–2.83) and ICU stay (SMD 0.93, 95% CI 0.50–1.36). Most analyses showed substantial heterogeneity.

Conclusion: Elevated postoperative lactate was associated with mortality, whereas lactate clearance showed no consistent prognostic value in current evidence.

Keywords: Pediatric Cardiac Surgery; Lactate Clearance; Cardiopulmonary Bypass; Postoperative Outcomes; Mortality

When Cardiomegaly Is Not Just Heart Failure: The Role of Echocardiography in Surgical Decision-Making for Tuberculous Pericardial Effusion

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Background: Tuberculous pericarditis remains a major cause of pericardial effusion in tuberculosis-endemic countries and may progress to life-threatening cardiac tamponade. Because its clinical manifestations are frequently nonspecific, distinguishing patients who require urgent pericardial intervention from those suitable for conservative management can be challenging. Echocardiography is essential for confirming the diagnosis, assessing hemodynamic significance, and guiding surgical referral.

Case Illustration/Description: A 56 years old man came to the ER with chief complaint of progressive dyspnea and recurrent postprandial vomiting for the last two weeks, accompanied with prolonged cough and intermittent fever. Physical examination revealed slightly muffled heart sound without hemodynamic instability. Chest X-Ray showed cardiomegaly, left pleural effusion, bilateral apical

consolidations, and pulmonary vascular redistribution, initially suggesting heart failure. Electrocardiography showed sinus tachycardia with low-voltage precordial QRS complexes. Transthoracic echocardiography revealed moderate-to-severe circumferential pericardial effusion (12–36 mm) with preserved left ventricular systolic function (ejection fraction 70%), no right atrial or right ventricular collapse, and no swinging heart, indicating the absence of echocardiographic features of cardiac tamponade. Diagnostic thoracocentesis results showed lymphocyte-predominant exudative pleural effusion with a positive Rivalta test, while cytology showed no malignant cells. In the context of pulmonary tuberculosis suggested by clinical and radiographic findings, tuberculous pericardial and pleural involvement was considered the most likely diagnosis. Anti-tuberculosis therapy was initiated. Patient showed an improvement on symptoms and remained clinically stable, referral for pericardiocentesis was unsuccessful because of limited local resources; patient discharged for close follow-up at tertiary referral center.

Conclusion: Cardiomegaly on chest x-ray should not be assumed to represent heart failure alone. Echocardiography was pivotal in identifying significant tuberculous pericardial effusion, excluding cardiac tamponade, and supporting a decision to defer invasive intervention while arranging referral. Integrating clinical, radiographic, and echocardiographic findings is crucial for optimizing surgical decision-making, particularly in resource-limited settings.

Keywords: Tuberculous pericarditis; tuberculosis; echocardiography; diagnostic challenge

Prognostic Value of High Intraoperative Pulsatility Index on Transit-Time Flow Measurement for Graft Failure and Repeat Revascularization After Coronary Artery Bypass Grafting: A Systematic Review and Meta-Analysis

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Background/Introduction: Transit-time flow measurement (TTFM) is routinely used during coronary artery bypass grafting (CABG) to assess graft quality. Among TTFM parameters, a high pulsatility index (PI) has been suggested as a marker of poor graft function; however, its prognostic significance for postoperative graft failure and adverse clinical outcomes remains uncertain.

Objectives: To evaluate the prognostic value of high intraoperative PI for graft failure, graft revision, and repeat revascularization after CABG, and to compare PI values between failed and patent grafts.

Method: A systematic review and meta-analysis of observational studies evaluating intraoperative PI measured by TTFM during CABG was performed. Studies comparing high versus normal PI or reporting PI values in failed and patent grafts were included. Random-effects models were used to calculate pooled mean differences (MD) for continuous outcomes and odds ratios (OR) with 95% confidence intervals (CI) for dichotomous outcomes.

Result: Eight studies involving 2,798 grafts were included. Failed grafts demonstrated significantly higher PI values than patent grafts (MD 1.62, 95% CI 0.55–2.68; $I^2=88\%$). High PI was associated with a markedly increased risk of graft failure (OR 34.35, 95% CI 6.61–178.49; $I^2=89\%$). Patients with high PI were also more likely to undergo intraoperative graft revision (OR 38.52, 95% CI 12.69–116.93; $I^2=0\%$) and repeat revascularization during follow-up (OR 19.22, 95% CI 5.58–66.14; $I^2=41\%$).

Conclusion: A high intraoperative PI measured by TTFM is strongly associated with graft failure, intraoperative graft revision, and repeat revascularization after CABG. These findings support the use of PI as an important prognostic indicator for intraoperative graft assessment and postoperative risk stratification. Further prospective studies are warranted to establish standardized PI cutoff values and optimize clinical decision-making.

Keywords: Coronary artery bypass grafting; Transit-time flow measurement; Pulsatility index; Graft failure; Repeat revascularization

Giant Symptomatic Right Atrial Cardiac Myxoma Arising Near the Coronary Sinus Ostium

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Background: Right atrial myxomas are uncommon and may mimic ischemic or nonspecific systemic disease, particularly when dynamic tricuspid inflow obstruction occurs. Attachment near the coronary sinus ostium is especially unusual. We report a case of a giant symptomatic right atrial myxoma arising from the region of coronary sinus ostium successfully managed with surgical resection.

Case Illustration/Description: A 44-year-old woman presented with five months of exertional dyspnea, chest discomfort, constitutional symptoms, and recurrent exertional presyncope/syncope after an initial suspicion of unstable angina. Physical examination showed stable vital signs and no right-sided heart failure. Transthoracic echocardiography (TTE) revealed a 7.8 x 4.7 cm mobile right atrial mass intermittently obstructing tricuspid inflow. Through median sternotomy under cardiopulmonary bypass, A giant tumor arising near the coronary sinus ostium was completely excised, relieving dynamic tricuspid inflow obstruction. Intraoperative transesophageal echocardiography (TEE) after excision and post operative TTE confirmed no residual mass, and histopathology confirmed myxoma. The patient was discharged on postoperative day two with marked symptomatic improvement. Early echocardiography should be considered in unexplained exertional dyspnea, syncope, or angina-like symptoms, because timely excision can be both diagnostic and curative

Conclusion: A giant right atrial myxoma arising near the coronary sinus ostium is an uncommon presentation that may cause significant tricuspid inflow obstruction and diverse clinical manifestation with the absence of clinical signs that are related to right-sided heart failure. Early echocardiography should be considered in unexplained

exertional dyspnea, syncope, or angina-like symptoms, because timely excision can be both diagnostic and curative

Keywords: right atrial myxoma ; coronary sinus ostium ; cardiac tumor ; case report

Preoperative CONUT Score and Prognostic Nutritional Index as Predictors of Postoperative Outcomes in Surgery for Pleural and Pulmonary Infectious Disease: A Systematic Review

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Background/Introduction: Patients undergoing surgery for infectious pulmonary and pleural disease frequently present with nutritional depletion that may increase operative risk. Whether preoperative Controlling Nutritional Status (CONUT) score or Prognostic Nutritional Index (PNI) predicts postoperative outcomes in this population has not been systematically examined.

Objectives: To evaluate the prognostic value of preoperative CONUT score and PNI for postoperative complications, pneumonia, chest tube duration, length of hospital stay, and 30-day mortality in adults undergoing surgery for pleural and pulmonary infectious diseases.

Method: PubMed, Embase, Cochrane CENTRAL, and Scopus were searched through June 2026 following PRISMA 2020 guidelines. Eligible designs were cohort and case-control studies reporting preoperative CONUT or PNI in adults undergoing surgery for empyema, bronchiectasis, tuberculosis sequelae, lung abscess, or aspergilloma. Risk of bias was assessed using the QUIPS tool.

Result: Six studies enrolling 768 patients met inclusion criteria. Across included studies, high CONUT score was consistently associated with increased postoperative complications. Low PNI was associated with major complications, higher 30-day mortality, prolonged hospital stay, and longer chest tube duration. Evidence quality was

limited by moderate risk of bias in most studies, small sample sizes, and heterogeneity in outcome definitions.

Conclusion: Available evidence suggests that preoperative CONUT score and PNI are associated with adverse postoperative outcomes after surgery for pleural and pulmonary infectious disease. These findings are preliminary given the limited number and size of included studies. Multicenter prospective studies with standardized complication grading and nutritional intervention arms are needed to confirm these associations.

Keywords: Controlling Nutritional Status score; Prognostic Nutritional Index; Empyema; Bronchiectasis; Nutritional status; Postoperative complications; Thoracic surgery; Systematic review

Beyond Limb Staging: Prognostic Value of the Wifl Classification Following Endovascular Revascularization in Chronic Limb-Threatening Ischemia — A Systematic Review and Meta-Analysis

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Background/Introduction: The Society for Vascular Surgery Wound, Ischemia, and foot Infection (Wifl) classification is widely used to stage chronic limb-threatening ischemia (CLTI) and guide revascularization decisions. As endovascular therapy (EVT) becomes the predominant revascularization strategy, reliable risk stratification is increasingly important. However, evidence remains fragmented by heterogeneous outcome reporting and prognostic effect estimates, precluding a comprehensive assessment of its prognostic performance after EVT.

Objectives: To systematically evaluate the prognostic value of baseline Wifl classification for predicting clinical outcomes following endovascular revascularization in patients with CLTI.

Method: A systematic review and meta analysis was performed in accordance with the PRISMA 2020 guidelines. PubMed, Scopus, and the Cochrane Library were searched

up to June 2026. Studies assessing the association of baseline Wifl classification with clinical outcomes following EVT for patients with CLTI were included. Outcomes included major amputation, amputation-free survival, wound healing, and mortality. When appropriate, adjusted hazard ratios (HRs) with 95% confidence intervals (CIs) were pooled using random-effects models, while studies with non-comparable effect estimates were synthesized narratively.

Result: Eight studies involving 31,204 patients were included. Pooled analysis showed that Wifl stage 4 was associated with a significantly higher risk of major amputation than stages 1–3 (RR 2.74, 95% CI 2.17–3.46; $P=37\%$). Adjusted analysis demonstrated that each one-stage increase in baseline Wifl independently predicted mortality following EVT (pooled HR 1.19, 95% CI 1.04–1.35; $P=0\%$). Individual studies consistently reported worse amputation-free survival, delayed wound healing, increased mortality, and higher reintervention rates with advancing Wifl stage.

Conclusion: Baseline Wifl classification provides clinically relevant prognostic information in patients with CLTI undergoing EVT. Higher Wifl stages were consistently associated with poorer limb and survival outcomes, although quantitative synthesis was limited by heterogeneous outcome reporting and effect estimates. Future prospective studies using standardized outcome definitions and prognostic measures are warranted.

Keywords: Chronic limb-threatening ischemia, Wifl classification, Endovascular therapy, Prognosis, Systematic review

Clinical, Perioperative, and Recovery Outcomes Following Multivessel Minimally Invasive Coronary Artery Bypass Grafting Versus Conventional Off-Pump Coronary Artery Bypass Grafting: A Systematic Review and Meta-analysis

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Background/Introduction: Multivessel coronary artery disease frequently requires surgical revascularization, with coronary artery bypass grafting (CABG) remaining the gold-standard treatment. Off-pump CABG (OPCAB) and minimally invasive CABG (MICS-CABG) were developed to reduce morbidity associated with conventional sternotomy and cardiopulmonary bypass. However, the technical complexity of MICS-CABG raises concerns regarding revascularization completeness, graft patency, and clinical outcomes, and comparative evidence across these approaches remains fragmented.

Objectives: To compare clinical, perioperative, and recovery outcomes between MICS-CABG and OPCAB.

Method: This study adhered to PRISMA guidelines and searched four electrical databases up to June 2026. Risk of bias was assessed using ROBINS-I. Meta-analyses were performed using mean difference (MD) and risk ratio (RR) with 95% confidence intervals (CI), analyzed in RevMan 5.4.

Result: Eight comparative studies comprising 2,635 patients (1,296 MICS-CABG and 1,339 OPCAB) were included. Most studies were judged to have a moderate risk of bias. Compared with OPCAB, MICS-CABG demonstrated comparable all-cause mortality, myocardial infarction, stroke, arrhythmia, complete revascularization, intensive care unit length of stay, mechanical ventilation duration, and reoperation for bleeding. MICS-CABG was associated with significantly lower rates of perioperative transfusion (RR 0.56, 95% CI 0.45–0.69) and surgical wound infection (RR 0.22, 95% CI 0.06–0.75), as well as a shorter hospital length of stay (MD ± 0.70 days, 95% CI ± 1.25 to ± 0.15). These benefits were accompanied by longer operative times (MD 58.27 minutes, 95% CI 28.39–88.15) and a lower number of grafts performed (MD ± 0.43 , 95% CI ± 0.73 to ± 0.13).

Conclusion: MICS-CABG achieved clinical outcomes comparable to OPCAB in multivessel revascularization, with advantages in transfusion requirements, wound infection rates, and hospitalization, albeit at the cost of longer operative times and fewer grafts. These findings support MICS-CABG as a safe and effective alternative in appropriately selected patients, though caution is warranted given the predominantly observational evidence base.

Keywords: Coronary artery bypass grafting, Minimally invasive surgery, Off-pump coronary artery bypass, Meta-analysis

From Creation to Continued Dialysis Use: One-Year Outcomes of Clamp-Assisted Arteriovenous Fistulas

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Background/Introduction: Autogenous arteriovenous fistulas (AVFs) are the preferred permanent vascular access for hemodialysis, but their value depends on successful cannulation and sustained function after creation. Evidence comparing tourniquet-assisted and clamp-assisted creation is limited, and real-world data on clamp-assisted AVFs from single-operator practice remain scarce.

Objectives:

To evaluate one-year outcomes of clamp-assisted autogenous AVFs in routine hemodialysis practice using a single-center, single-operator retrospective cohort.

Method: We reviewed all adults who underwent clamp-assisted autogenous AVF creation by a single operator between April 1, 2024 and March 31, 2025. Baseline characteristics, AVF configuration, dialysis use, time to cannulation, interventions, thrombosis, and abandonment were extracted from operative and clinical records. The primary endpoint was one-year functional patency, defined as continued hemodialysis use through the AVF up to one year without permanent abandonment. Proportions carry Wilson 95% confidence intervals (CI); associations used Fisher exact tests and logistic regression.

Result: Of 161 register entries, 38 deceased or non-evaluable patients and 2 duplicates were excluded, leaving 121 AVFs (mean age 49.6 ± 12.1 years; 66.9% male; 33.9% diabetic; 90.8% already on dialysis). Brachiocephalic was the most common configuration (65.3%). Median time to first cannulation was 8.7 weeks, and 89.5% were first used at six weeks or later, consistent with the rule of 6. Successful clinical use reached 94.2% (95% CI 88.5–97.2) and one-year

functional patency 84.3% (95% CI 76.8–89.7); conditional patency among used accesses was 89.5%. Primary failure occurred in 5.8% and secondary failure in 9.9%; intervention, thrombosis, and abandonment were each uncommon. Intervention need ($p = 0.001$) and brachiocephalic configuration ($p = 0.003$) were associated with patency loss; age, sex, diabetes, and hypertension were not predictive.

Conclusion: Clamp-assisted autogenous AVFs achieved high usability and one-year functional patency exceeding 84%, a benchmark for centers without tourniquet-assisted creation.

Keywords: arteriovenous fistula; hemodialysis; vascular access; functional patency; clamp-assisted technique.

Surgical Outcomes and Prognostic Determinants of Mortality in Patients With Acute Type A Aortic Dissection and Ruptured Thoracic Aortic Aneurysm: A Systematic Review and Meta-Analysis

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Background/Introduction: Acute Type A aortic dissection (ATAAD) and ruptured thoracic aortic aneurysm (rTAA) are life-threatening cardiovascular emergencies associated with high postoperative mortality despite advances in surgical techniques and perioperative care. Identifying factors associated with mortality is essential for optimizing surgical management and improving patient outcomes.

Objectives: To evaluate surgical outcomes and identify prognostic determinants of postoperative mortality in patients undergoing surgical treatment for ATAAD and rTAA.

Method: A systematic review and meta-analysis were conducted in accordance with the PRISMA guidelines. PubMed, Scopus, ScienceDirect, and Web of Science were searched for eligible studies published between January 2021 and January 2026. Randomized controlled trials, cohort studies, and case-control studies involving adult patients undergoing open or endovascular repair were included. The



primary outcome was postoperative mortality, while prognostic factors associated with mortality were systematically evaluated.

Result: Of 1,529 identified records, 10 studies met the inclusion criteria. Postoperative mortality ranged from 7% to 27%, with most studies reporting rates between 9% and 18%. Advanced age, preoperative hemodynamic instability, organ malperfusion, renal dysfunction, and prolonged operative duration were consistently associated with increased postoperative mortality across the included studies.

Conclusion: Postoperative mortality following surgical treatment for ATAAD and rTAA remains substantial. Advanced age, hemodynamic instability, organ malperfusion, renal dysfunction, and prolonged operative duration are consistent predictors of mortality. These findings support the importance of early risk assessment and individualized perioperative management to improve surgical outcomes.

Keywords: Acute Type A aortic dissection (ATAAD); Ruptured thoracic aortic aneurysm; Surgical outcomes; Mortality; Prognostic factors

Early and Long-Term Stroke Outcomes Following Transcatheter Versus Surgical Aortic Valve Replacement in Patients With Bicuspid Aortic Valve Stenosis: A Systematic Review and Meta-analysis

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Background/Introduction: Bicuspid aortic valve predisposes to aortic stenosis, with up to 50% of affected individuals ultimately requiring valve replacement. Stroke represents a major complication following intervention, yet the comparative neurological safety of transcatheter versus surgical aortic valve replacement remains uncertain, with prior studies reporting inconsistent findings.

Objectives: To compare the risks of early and long-term stroke following transcatheter versus surgical aortic valve replacement in patients with bicuspid aortic valve stenosis.

Method: A systematic review and meta-analysis was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement. PubMed, ScienceDirect, Epistemonikos, and Europe PMC were systematically searched from database inception through June 2026. Comparative studies evaluating transcatheter aortic valve replacement (TAVR) versus surgical aortic valve replacement (SAVR) in patients with bicuspid aortic valve stenosis were included. Risk ratios (RRs) with 95% confidence intervals (CIs) were pooled using the Mantel-Haenszel random-effects method.

Result: Twelve comparative studies met the inclusion criteria. Seven studies involving 15,988 patients were included in the meta-analysis of early stroke, whereas seven studies involving 6,658 patients were included in the meta-analysis of long-term stroke. Pooled analysis showed no significant difference in early stroke between TAVR and SAVR (RR 0.90, 95% CI 0.33–2.47; $P=0.84$), despite substantial heterogeneity ($I^2=94\%$). Similarly, no significant difference was observed in long-term stroke between TAVR and SAVR (RR 1.10, 95% CI 0.64–1.87; $P=0.73$), with moderate heterogeneity ($I^2=57\%$).

Conclusion: Among patients with bicuspid aortic valve stenosis, TAVR and SAVR demonstrated comparable risks of both early and long-term stroke. These findings support TAVR as a neurologically comparable alternative to SAVR in appropriately selected patients, although additional prospective studies with longer follow-up are needed to strengthen the current evidence.

Keywords: bicuspid aortic valve stenosis; transcatheter aortic valve replacement; surgical aortic valve replacement; stroke; meta-analysis

Beyond Traditional Risk Scores: Artificial Intelligence and Machine Learning for Risk Prediction in Coronary Artery Bypass Grafting

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Background/Introduction: Coronary artery bypass grafting (CABG) requires accurate preoperative risk stratification to optimize patient outcomes. Traditional risk models,

including EuroSCORE II and the Society of Thoracic Surgeons Predicted Risk of Mortality (STS PROM), have limited ability to capture complex nonlinear interactions among clinical variables. Artificial intelligence (AI) and machine learning (ML) have emerged as promising alternatives for risk prediction.

Objectives: To review recent evidence regarding the application of AI and ML in CABG risk prediction and evaluate their performance compared with conventional risk scoring systems.

Method: A review of studies published from 2021 to 2026 was conducted using PubMed, Scopus, and MEDLINE. Studies evaluating AI and ML based models for predicting CABG outcomes were included.

Result: Random Forest, XGBoost, ensemble stacking models, and deep learning architectures consistently outperformed traditional risk scores across multiple studies. Reported discrimination ranged from AUC 0.782–0.98 for ML models, compared with approximately 0.722 for EuroSCORE II. AI-based models accurately predicted in-hospital and 30-day mortality, acute kidney injury, postoperative atrial fibrillation, prolonged ventilation, major adverse cardiac and cerebrovascular events, and long-term survival. Ensemble approaches achieved AUC values up to 0.9395, while net reclassification improvement reached 0.221 compared with conventional logistic regression. Explainable AI techniques, including SHAP and LIME, identified age, creatinine, left ventricular ejection fraction, estimated glomerular filtration rate, and cardiopulmonary bypass duration as the most influential predictors.

Conclusion: AI and ML models demonstrate superior predictive performance and calibration compared with traditional CABG risk scores. External validation and integration into clinical workflows remain necessary before widespread clinical adoption.

Keywords: coronary artery bypass grafting; machine learning; artificial intelligence; risk prediction; EuroSCORE II; explainable AI.

Surgical Stabilization of Rib Fractures versus Nonoperative Management in Adults With Flail Chest or Multiple Rib Fractures: A Systematic

Review and Meta-analysis of Randomized Controlled Trials

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Background/Introduction: Adults with flail chest or multiple rib fractures following blunt thoracic trauma are at increased risk of respiratory complications, prolonged hospitalization, and substantial morbidity. Surgical stabilization of rib fractures (SSRF) has emerged as an alternative to nonoperative management; however, evidence from randomized controlled trials (RCTs) remains limited.

Objectives: To evaluate the effectiveness of SSRF compared with nonoperative management in reducing pneumonia and hospital length of stay (HLOS) among adults with flail chest or multiple rib fractures.

Method: A systematic review and meta-analysis of RCTs was conducted in accordance with the PRISMA 2020 statement. PubMed and the Cochrane Library were systematically searched to identify eligible RCTs comparing SSRF with nonoperative management. Risk of bias was assessed using the Cochrane Risk of Bias 2 (RoB 2) tool. Pneumonia and HLOS were pooled using random-effects models, with fixed-effect models used for sensitivity analyses.

Result: Three RCTs involving 156 participants were included. Risk of bias assessment identified one study with low risk of bias and two studies with some concerns. Compared with nonoperative management, SSRF did not significantly reduce pneumonia (RR 0.86, 95% CI 0.39–1.88; $P = 0.70$; $I^2 = 53\%$) or HLOS (MD ± 3.84 days, 95% CI ± 8.39 to 0.71; $P = 0.10$; $I^2 = 60\%$). Sensitivity analysis using a fixed-effect model showed a significant reduction in HLOS.

Conclusion: Based on the currently available randomized evidence, SSRF was not associated with statistically significant reductions in pneumonia or hospital length of stay compared with nonoperative management under the primary random-effects model. Further adequately powered multicenter RCTs are required to confirm the effectiveness of SSRF in adults with flail chest or multiple rib fractures.



Keywords: Flail chest; Multiple rib fractures; Surgical stabilization of rib fractures; Randomized controlled trial; Systematic review; Meta-analysis

Early and Mid-Term Outcomes of Minimally Invasive Coronary Artery Bypass Grafting versus Conventional Sternotomy Coronary Artery Bypass Grafting in Patients with Diabetes Mellitus: A Systematic Review and Meta-Analysis

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Background/Introduction: Diabetes mellitus (DM) is a major independent risk factor for adverse outcomes after coronary artery bypass grafting (CABG). Minimally invasive CABG (MICS-CABG) may offer advantages, particularly in wound-related complications, but its comparative effectiveness in diabetic patients remains uncertain.

Objectives: MICS-CABG confers significant perioperative benefits in diabetic patients, particularly in reducing sternal wound complications and resource utilization, without compromising early safety. However, completeness of revascularization remains a critical determinant of mid-term outcomes, particularly in multivessel disease.

Method: The study strictly adhered to the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020 guidelines for studies comparing MICS-CABG versus conventional sternotomy CABG in diabetic patients. Primary outcome was 30-day/in-hospital mortality. Secondary outcomes included MACCE, myocardial infarction, stroke, deep sternal wound infection (DSWI), mechanical ventilation duration, ICU and hospital length of stay (LOS), repeat revascularization, and mid-term survival. Random-effects meta-analyses were performed.

Preoperative IABP Versus No IABP in Isolated CABG Patients With Severe Left Ventricular Dysfunction (LVEF $\leq$ 35%): A Systematic Review and Meta-Analysis

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Background/Introduction: Patients with severe left ventricular dysfunction (LVEF $\leq$ 35%) undergoing isolated coronary artery bypass grafting (CABG) are at high risk of perioperative low cardiac output syndrome, major adverse cardiovascular events, and mortality. Although prophylactic preoperative intra-aortic balloon pump (IABP) has been proposed to improve perioperative hemodynamic stability, its clinical benefit remains uncertain.

Objectives: To evaluate the efficacy and safety of preoperative IABP compared with no preoperative IABP in patients with severe left ventricular dysfunction undergoing isolated CABG.

Method: A systematic search of PubMed, Embase, and Scopus was conducted from database inception. Comparative studies evaluating preoperative IABP versus no IABP in adults with LVEF $\leq$ 35% undergoing isolated CABG were included. Two reviewers independently performed study selection, data extraction, and risk of bias assessment using the ROBINS-I tool. Random-effects meta-analysis was performed to calculate pooled odds ratios (ORs) with 95% confidence intervals (CIs). Heterogeneity was assessed using the I^2 statistic.

Result: Seven observational studies involving 1,685 patients were included, with 466 receiving preoperative IABP and 1,219 managed without IABP. ROBINS-I assessment identified one study at low risk of bias, five at moderate risk, and one at serious risk. Random-effects analysis demonstrated no significant difference in mortality (OR 0.56, 95% CI 0.10–3.02; $p=0.35$; $I^2=40.1\%$), reoperation (OR 0.76, 95% CI 0.38–1.54; $p=0.45$; $I^2=0\%$), stroke (OR 0.77, 95% CI 0.23–2.55; $p=0.67$; $I^2=0\%$), or acute kidney injury (OR 0.84, 95% CI 0.48–1.47; $p=0.54$; $I^2=0\%$). A non-significant trend toward longer hospital length of stay was observed with IABP (OR 2.72, 95% CI 0.74–9.94; $p=0.13$).

Conclusion: Preoperative IABP was not associated with significant improvements in mortality or major postoperative outcomes in patients with severe left ventricular dysfunction undergoing isolated CABG. Current evidence does not support the routine prophylactic use of preoperative IABP, although adequately powered

randomized controlled trials are needed to identify patients who may benefit from this strategy.

Keywords: intra-aortic balloon pump; coronary artery bypass grafting; CABG; severe left ventricular dysfunction; low ejection fraction

Challenges in Pudendal Artery Endovascular Intervention for Arteriogenic Erectile Dysfunction

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Background/Introduction: A Vasogenic ED are categorized based on vascular issue involved such as arteriogenic ED due to insufficient arterial blood flow, or venogenic ED that caused by improper venous outflow. Endovascular treatments have since becoming promising options for addressing ED. However, it has some challenges such as choice of device, access choice and identification of artery anatomy.

Objectives: This study reports cases of patients with arteriogenic ED that treated with endovascular intervention in pudendal artery.

Method: This study was conducted involving patients with erectile dysfunction (ED) enrolled between January 2025 and June 2026. Eligible participants had ED refractory to phosphodiesterase-5 inhibitors (PDE5i), including sildenafil and tadalafil. Erectile function was assessed using the International Index of Erectile Function-5 (IIEF-5). Patients underwent treatment with drug-eluting balloon (DEB), drug-eluting stent (DES), or vasodilator therapy. IIEF-5 scores were reassessed at follow-up up to 6 weeks after treatment.

Result: Sixteen patients were included, comprising 8 treated with DEB, 5 with DES, and 3 with vasodilator therapy. The mean age was 59.0±8.67 years, 49.2±7.73 years, and 51.67±15.01 years in the DEB, DES, and vasodilator groups, respectively. Most patients presented with severe ED at baseline. Mean pre-treatment IIEF-5 scores were 6.13±1.89, 7.60±0.55, and 6.33±1.15 in the DEB, DES, and vasodilator groups, respectively, improving to 14.13±4.82, 19.00±6.96, and 20.33±2.08 at follow-up. The greatest mean improvement in

IIEF-5 score was observed in the vasodilator group (14.00±2.65), followed by the DES (11.40±6.62) and DEB (8.00±4.44) groups.

Conclusion: Endovascular intervention of the pudendal artery was associated with improved erectile function in patients with arteriogenic ED refractory to PDE5 inhibitors. In this case series, intra-arterial vasodilator therapy demonstrated the greatest improvement in IIEF-5 scores, followed by DES and DEB treatment. Larger studies with longer follow-up are needed to confirm these findings and determine the comparative effectiveness of these endovascular treatment modalities

Keywords: Erectile Dysfunction, Endovascular Intervention, Pudendal Artery

Perioperative Profile and Outcomes of Minimally Invasive Direct Coronary Artery bypass Over the Past Decade: A Systematic Review and Single-Arm Meta-Analysis

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Background/Introduction: Minimally invasive direct coronary artery bypass (MIDCAB) has been continuously developed as a less invasive alternatives approach of coronary artery disease (CAD). Reintervention is associated with postoperative outcomes.

Objectives: This study aims to investigate the preoperative characteristics, the most common cause of conversion, and the clinical outcomes of MIDCAB.

Method: The systematic review was conducted according to the PRISMA guidelines. All relevant studies were searched through PubMed, ScienceDirect, and Google Scholar databases, focusing on minimally invasive direct coronary artery bypass published from 2016 to the end of May 2026. The search strategy included the concepts of "Minimally Invasive Direct Coronary Artery Bypass" or "Conversion" and "Outcomes". Preoperative characteristics, perioperative, and short-to-mid term results from included studies were pooled using single-arm meta-analysis of proportion or means in a random effects model.

Result: Eleven retrospective observational cohort studies involving 7.662 participants were analyzed. A high level of

heterogeneity was observed among the baseline characteristics of the included studies. Conversion rate to sternotomy overall was less than 0.02 (95% confidence interval (CI): 0.01-0.04). The most common cause of conversion was left internal thoracic artery (LITA) injury at 0.27 (95% CI: 0.18-0.39). The pooled 30-day mortality rate was 0.012 (95% CI: 0.006-0.02), post operative myocardial infarction (MI) rate was 0.008 (95% CI: 0.005-0.012), post operative stroke rate was 0.013 (95% CI: 0.01-0.016), indicating favorable early clinical outcomes. The other surgical and postoperative complications including blood transfusion was 0.11 (95% CI: 0.06-0.18), reexploration rate was 0.03 (95% CI: 0.02-0.05), wound infection was 0.02 (95% CI: 0.01-0.06), and new onset atrial fibrillation (AF) was 0.1 (95% CI: 0.05-0.2).

Conclusion: MIDCAB yields highly favorable and safe early clinical outcomes, even when conversion to sternotomy is required.

Keywords: Minimally invasive direct coronary artery bypass; Conversion to Sternotomy; Clinical Outcomes

Perioperative Outcomes of Uniportal Video-Assisted Thoracoscopic Surgery for Stage II and Stage III Empyema: A Systematic Review and Meta-Analysis

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Background/Introduction: Thoracic empyema is a severe pleural infection associated with substantial morbidity and mortality. Uniportal video-assisted thoracoscopic surgery (U-VATS) has emerged as a minimally invasive alternative for advanced empyema. However, evidence regarding its perioperative outcomes remains limited.

Objectives:

This systematic review and meta-analysis evaluated perioperative outcomes of U-VATS in Stage II and Stage III empyema.

Method: A systematic review and single-arm meta-analysis was conducted according to the PRISMA 2020 guidelines. Six electronic databases were searched for studies published between 2016 and 2026. Cohort studies

and randomized controlled trials evaluating U-VATS in Stage II or III empyema were included. Risk of bias was assessed using the Joanna Briggs Institute Critical Appraisal Checklist for Case Series. Random-effects meta-analyses were performed to pool proportions and continuous outcomes. Heterogeneity, subgroup, meta-regression, publication bias, and sensitivity analyses were conducted.

Result: Fifteen studies involving 1,204 patients were included, with 13 studies rated as high quality. The pooled conversion rate was 1% (95% CI 0-3%; $I^2=0\%$), while no perioperative mortality was observed ($I^2=0\%$). The pooled postoperative morbidity was 17% (95% CI 6-37%; $I^2=85.4\%$). Pooled operative time was 127.37 minutes, estimated blood loss 371.94 mL, length of hospital stay 8.88 days, postoperative pain score 2.36/10, and drain duration 12.19 days, all with substantial heterogeneity ($I^2>98\%$). Stage III empyema was associated with significantly longer operative time, greater blood loss, and prolonged drain duration. Sensitivity analyses confirmed the robustness of the pooled estimates, and publication bias assessment detected no significant small-study effects.

Conclusion: U-VATS is a safe and feasible approach for Stage II and III empyema, demonstrating consistently low conversion and mortality rates. Advanced disease is associated with greater operative complexity and postoperative morbidity, highlighting the need for prospective multicenter studies with long-term outcomes.

Keywords: Uniportal Video-Assisted Thoracoscopic Surgery; U-VATS; Empyema; Perioperative; Meta-Analysis

Extensive Recurrent Myxoid Liposarcoma Involving the Diaphragm and Chest Wall: A Case Report

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Background: Liposarcoma is a rare malignant mesenchymal tumor accounting for approximately 13%-20% of all soft tissue sarcomas. Histologically, it is classified into four major subtypes: well-differentiated, myxoid, dedifferentiated, and pleomorphic. Most patients are

asymptomatic; however, abdominal or retroperitoneal lesions may present with abdominal pain, flank discomfort, or constipation.

Case Illustration/Description: A 43-year-old man presented with abdominal distension and a progressively enlarging fist-sized mass since early 2026. He had multiple previous lipoma surgeries in the left lateral hemithorax, with the latest pathology in 2025 revealing myxoid liposarcoma. Abdominal CT showed multiple masses with cystic components occupying the right anterior subdiaphragm and compressing the lateral liver, suspicious for liposarcoma. Intraoperatively, multiple lipomatous masses with intact glistening capsules were found in the extraperitoneal space, compressing the liver, infiltrating the right hemidiaphragm, and extending into the right thoracic cavity. A mass on the right anterior chest wall destroyed the eleventh rib, requiring an additional right hemithorax incision at the tenth intercostal space for better approach to the tumor. Pathological examination showed round cell liposarcoma. Selection of an appropriate surgical approach and incision site is important to optimize tumor exposure and achieve complete resection. Hu et al reported that a thoracic approach may provide better access to tumor tissue than an abdominal incision in selected cases. Due to the unresectable thoracic component and previous surgical history, multidisciplinary management was considered, with radiotherapy and chemotherapy recommended. Although liposarcoma generally has a favorable prognosis, outcomes depend on tumor location, resection completeness, and negative margins. Well-differentiated liposarcoma has a higher risk of local recurrence after incomplete resection but limited metastatic potential, whereas dedifferentiated and myxoid subtypes have poorer outcomes.

Conclusion: Extensive myxoid liposarcoma with intrathoracic extension presents a significant surgical challenge. Careful preoperative planning, an individualized surgical strategy, and multidisciplinary management are essential when complete resection is not feasible.

Keywords: Liposarcoma; thoracic involvement; surgical resection

Beyond the Scalpel: A Network Meta-Analysis Comparing Transcatheter, Sutureless, and

Surgical Aortic Valve Replacement in Low-to-Intermediate Risk Patients

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Background/Introduction: Aortic stenosis remains the most common valvular heart disease requiring intervention, with evolving strategies challenging the traditional role of Surgical Aortic Valve Replacement (SAVR). Transcatheter Aortic Valve Replacement (TAVR) has expanded into low-to-intermediate risk populations, while Sutureless Aortic Valve Replacement (SL-AVR) offers a hybrid alternative aimed at reducing operative burden. However, comparative effectiveness across these modalities remains uncertain.

Objectives:

We aim to assess the comparative efficacy of aortic valve replacement (AVR) interventions in aortic stenosis patients of low-to-intermediate surgical risk.

Method: A systematic search of PubMed, Cochrane Library, Europe PMC, and EBSCO identified randomized and propensity score-matched studies comparing TAVR, SAVR, and SL-AVR. Low-to-intermediate risk was defined as EuroSCORE $\geq 20\%$, EuroSCORE II $\geq 5\%$, or STS $\geq 8\%$. Short-term (≥ 30 days) and long-term (≥ 1 year) outcomes were analyzed using random-effects pairwise and network meta-analysis.

Result: Thirty-two studies involving 22,613 participants (TAVR=8,519; SAVR=8,810; SL-AVR=5,284) were included. No significant differences in short-term or long-term all-cause mortality (ACM) were observed on all comparison groups. Compared with TAVR, SL-AVR was associated with a lower risk of myocardial infarction (MI). TAVR and SL-AVR were both associated with lower risks of new onset atrial fibrillation (AF) than SAVR. TAVR also reduced the risk of de novo dialysis compared with SAVR. Conversely, TAVR and SL-AVR were linked to higher rates of short-term and long-term permanent pacemaker (PPM) implantation. Most findings were supported by low or very low certainty evidence and should be interpreted as hypothesis-generating.

Conclusion: Minimally invasive procedures represent effective alternatives to conventional surgery for AVR in low-to-intermediate risk patients. However, both TAVR and SL-AVR are associated with an increased risk of conduction

abnormalities, and SL-AVR additionally confers a higher risk of stroke.

Keywords: aortic valve replacement; transcatheter intervention; surgery; sutureless valve; minimally invasive procedure

Modified Open Window Thoracostomy with a Wound Retractor in Pleural Empyema Complicated by Sepsis: A Case Report

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Background: Pleural empyema remains a significant challenge due to its substantial mortality. Septic patients are often unsuitable for decortication, making open window thoracostomy (OWT) an option for infection control. Despite being life-saving, the conventional OWT requires permanent chest wall opening and prolonged wound care, which may impair quality of life (QoL). Modified OWT by using wound retractor has been reported to improve patient QoL, reducing length-of-stay and procedure-related morbidity

Case Illustration/Description: A 14-year-old boy was referred to our hospital with progressive dyspnoea, chest pain, fever, productive cough, and significant weight loss over three weeks. On admission, he remained septic despite receiving intravenous antibiotics for three days prior. Chest radiography demonstrated a loculated left pleural effusion, while laboratory investigations revealed marked leucocytosis and elevated C-reactive protein levels. Modified OWT was performed through left lateral thoracotomy with resection of the sixth rib. Skin flaps were sutured to the empyema cavity to create a drainage window which maintained by using a 90 x 90 wound retractor. Intraoperative findings included extensive pleural peel involving the entire hemithorax. Purulent exudate was evacuated and collected for further analysis. Regular dressing changes were performed to allow complete drainage. Post-operatively, the patients showed rapid

clinical and inflammatory marker improvement. The septic condition subsided immediately after procedure and patient was discharged after 7 days. Three months later, re-exploration demonstrated improved lung expansion, allowing subsequent decortication. The wound retractor was downsized to 60 x 60 and the wound was allowed to heal by secondary intention. Chest wall reconstruction was performed six months later.

Conclusion: Modified OWT by using wound retractor is an effective alternative procedure for pleural empyema complicated by sepsis, facilitating prompt infection control while preserving patient's QoL.

Keywords: Empyema; Modified Open Wound Thoracostomy; Sepsis; Wound Retractor

Suprarenal-Infrarenal Saccular Abdominal Aortic Aneurysm with Intraoperative Findings Suggestive of Aortitis in a Young Female with Chronic Kidney Disease: Diagnostic Considerations and Successful Renal-Preserving Open Surgical Repair: A Case Report

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Background: Abdominal aortic aneurysm (AAA) in young females is rare and often driven by inflammatory, autoimmune, or heritable etiologies rather than atherosclerosis. Open surgical repair (OSR) provides long-term durability but introduces massive warm ischemia and hemodynamic challenges, which are highly complex when compounded by chronic kidney disease (CKD) and anemia.

Case Illustration/Description: A 34-year-old female (51 kg) of reproductive age with CKD Stage 3B (creatinine: 1.71 mg/dL), anemia (hemoglobin: 8.3 g/dL), and a giant 8.4-cm saccular suprarenal-infrarenal AAA underwent urgent OSR. EVAR was contraindicated due to narrow renal arteries (4.0 mm), acute left iliac angulation (9.2 mm), and high contrast-induced nephropathy risk. Intraoperatively, the aortic wall was uniquely friable, edematous, and non-calcified, suggesting active inflammatory aortitis rather than classic degenerative disease. To prevent intimal injury,

gentle low-pressure clamping was mandated. Managing this atypical pathology in a low-volume (3.3 L) female frame with anemia required a targeted preemptive blood component transfusion (PRC, FFP, platelets) and strict fluid restriction (Ringer's Lactate: 100 mL load, 50 mL/hour) to avert renal venous congestion. Post-declamping reperfusion injury was mitigated with N-acetylcysteine and titrated furosemide. AAA exclusion was successful, with stable discharge creatinine (1.74 mg/dL) on postoperative day (POD) 6, zero dialysis, and excellent POD-2 diuresis (2.2 mL/kg/hour).

Conclusion: The soft, friable aortic wall in this young female strongly implies an underlying systemic inflammatory or genetic aortopathy rather than atherosclerosis. While OSR with tailored cardiorenal protection successfully achieved aneurysm exclusion and renal preservation, the coexistence of CKD warrants extensive outpatient follow-up. This includes comprehensive lipid profiles, autoimmune serology, family screening, and targeted genome sequencing to clarify the systemic etiology and guide future pregnancy-related aortic risk counseling.

Keywords: Aortic Aneurysm, Abdominal; Aortitis; Renal Insufficiency, Chronic; Warm Ischemia; Vascular Surgical Procedures

From Percutaneous Clip to Definitive Cure: Single-Stage Mitral Valve Replacement with Concomitant Maze Procedure, ASD Closure and LAA Closure Restoring Sinus Rhythm in Recurrent Severe Mitral Regurgitation

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Background: Transcatheter edge-to-edge repair (TEER) offers a lifeline to high-risk patients with severe mitral regurgitation (MR), but the clip is not always permanent. When it fails, up to 94% of patients require mitral valve replacement (MVR) rather than repeat repair, owing to leaflet damage and advanced atrial remodeling from the index procedure. Standardized surgical protocols for this scenario remain limited, particularly in Indonesia.

Case Illustration/Description: A 68-year-old male with hypertension, paroxysmal atrial fibrillation, prior ischemic stroke and heart failure underwent TEER with three MitraClip devices in 2024. A year later, he presented with gradually progressive dyspnea, palpitations, and recurrent atrial fibrillation (AF). Echocardiography confirmed residual moderate to severe eccentric MR and a severely dilated left atrium, left atrial volume index (LAVI) 155 mL/m², establishing clip failure. Complicating matters, he had an extensive analgesic allergy spanning opioids, nonsteroidal anti-inflammatory drugs and paracetamol, managed instead with fentanyl and celecoxib. He underwent single-stage MVR with a 31 mm bioprosthesis, concomitant Cardioblate Maze procedure, closure of a 3 mm iatrogenic atrial septal defect found on table, and left atrial appendage closure. Intraoperative transesophageal echocardiography confirmed a well seated prosthesis without paravalvular leak, with return of sinus rhythm. His postoperative course was notable for transient neurological events, tic-like movements, tremor, and dysarthria, with no new lesion on brain imaging and full resolution. He was extubated within 10 hours and discharged on postoperative day 13. At outpatient follow up, echocardiography confirmed ejection fraction 55% with a well functioning prosthesis, Holter monitoring showed marked improvement in rhythm burden with no atrial fibrillation, and electrocardiography confirmed normal sinus rhythm.

Conclusion: Comprehensive single stage surgery combining valve replacement, Maze ablation, and defect closure achieved durable rhythm restoration and excellent valve function after TEER failure, underscoring the value of standardized perioperative protocols in high risk Indonesian cardiac surgery.

Keywords: Mitral valve replacement; Transcatheter edge-to-edge repair; MitraClip failure; Maze procedure; Atrial fibrillation

Protecting the Developing Brain: A Systematic Review and Network Meta-Analysis of Perioperative Pharmacological Neuroprotection in Pediatric Congenital Heart Surgery with Cardiopulmonary Bypass and Circulatory Arrest

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Background/Introduction: Neurological injury is a major complication of surgery for congenital heart disease, as the immature brain is highly vulnerable to ischemic stress and inflammation from cardiopulmonary bypass (CPB) and deep hypothermic circulatory arrest (DHCA). Numerous medications are administered perioperatively to protect against this, but direct comparative evidence is scarce.

Objectives: To compare and rank perioperative pharmacological neuroprotective agents by their effect on brain-injury biomarkers and neurological outcomes in children undergoing CPB and/or DHCA.

Method: The systematic review was conducted through a search on PubMed, Scopus, and ScienceDirect up to June 2026 for randomized controlled trials. All included studies were appraised by the Cochrane risk-of-bias tool (version 2), and fitted random-effects network meta-analyses in R 4.5.0. The primary outcome was the standardized mean difference in post-operative change of S100B marker; secondary outcomes were neuron-specific enolase (NSE), ventilator hours, and a composite neurological outcome. Treatment hierarchy and comparative effectiveness were assessed using P-score, while publication bias was evaluated using funnel plot and Egger's test.

Result: The network analysis of Ten included RCTs (2,391 children) revealed that ketamine – the only N-methyl-D-aspartate–receptor antagonist studied – ranked first (P-score 0.92) and was the single agent that significantly lowered the S100B biomarker versus control (SMD -1.01, 95% confidence interval [CI] -1.88 to -0.14), followed by alpha-2 agonist desmedetomidine (SMD -0.49; P-score 0.66). Additionally, exploratory dose-level analysis showed the highest dose of ketamine (0.3 mg/kg/h) also ranking best (P-score 0.71). Ketamine was also superior for NSE (P-score 0.91), whereas dexmedetomidine most effectively shortened

ventilation (SMD -0.55, 95% CI -0.99 to -0.10; P score 0.91). Neither ketamine nor dexmedetomidine improved the combined neurological outcome.

Conclusion: In this first network meta-analysis on the question, ketamine gave the strongest biomarker signal and dexmedetomidine the quickest ventilator recovery, though the biomarker result leans heavily on one trial and clinical outcomes were comparable.

Keywords: Neuroprotection; Congenital Heart Disease; Cardiopulmonary Bypass; S100B; Network Meta-Analysis

Evaluating the Optimal Second Conduit for Coronary Artery Bypass Graft: Comparing No-Touch Saphenous Vein and Radial Artery Grafts in Patients with Multivessel Coronary Artery Disease-A Systematic Review and Meta-Analysis

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Background/Introduction: Coronary artery disease remains a leading cause of death globally, with multivessel disease (MVD) carrying a worse prognosis. Coronary artery bypass grafting (CABG) is the preferred revascularization strategy for complex MVD, and the choice of second conduit—commonly either the radial artery (RA) or saphenous vein graft (SVG)—is a key determinant of long-term outcomes. The no-touch saphenous vein graft (NT-SVG) harvesting technique has emerged as a Method to improve SVG durability, yet direct comparison with RA remains inconclusive. This review aimed to compare NT-SVG and RA as second conduits in patients with MVD undergoing CABG.

Objectives: This systematic review and meta-analysis aimed to evaluate the comparative effectiveness and safety of NT-SVG and RA as second conduits in patients with multivessel coronary artery disease undergoing CABG.

Method: Following PRISMA 2020, we systematically searched PubMed, EuropePMC, ScienceDirect, and ClinicalTrials.gov. Eligible studies were randomized trials and propensity-matched observational studies comparing NT-SVG and RA

as a second conduit. Risk of bias was assessed using RoB 2.0 and ROBINS-I. Outcomes (graft occlusion, distal anastomoses, stroke, mortality) were pooled using fixed- or random-effects models based on I^2 heterogeneity.

Result: Three studies (two randomized trials and one propensity-matched cohort) involving 376 patients from Sweden, South Korea, and Thailand were included. No significant differences were found between NT-SVG and RA for graft occlusion (OR 0.83, 95% CI 0.09–8.10), distal anastomoses (MD 0.08, 95% CI -0.41–0.56; $I^2=75.3\%$), stroke (OR 0.49, 95% CI 0.04–5.56; $I^2=0\%$), or mortality (OR 1.87, 95% CI 0.23–15.50; $I^2=0\%$).

Conclusion: NT-SVG and RA showed comparable outcomes for graft occlusion, distal anastomoses, stroke, and mortality, supporting both as viable second conduits in CABG. However, the limited number of studies and substantial heterogeneity for some outcomes warrant cautious interpretation and further investigation in larger prospective studies (PROSPERO CRD420261427313).

Keywords: Coronary artery bypass grafting; No-touch technique; Meta-analysis; Radial artery; Saphenous vein

Beyond the Incision: A Network Meta-Analysis of Non-intubated, Intubated Video-Assisted, and Robotic-Assisted Surgery for Early-Stage Non-Small Cell Lung Cancer

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Background/Introduction: Surgical treatment for early stage Non-Small Cell Lung Cancer (NSCLC) has progressively shifted toward a more minimally invasive approach. Although Video-Assisted Thoracic Surgery (VATS) and Robotic-Assisted Thoracic Surgery (RATS) reduced incisional trauma, the physiological burden associated with conventional general anesthesia and

endotracheal intubation persists. Consequently, Non-intubated VATS (NIVATS) has emerged as an innovative approach with “anesthesia minimalism” strategy.

Objectives: This study aims to evaluate the comparative efficacy and recovery profiles of NIVATS, intubated VATS (iVATS), and RATS using a Bayesian network meta-analysis framework.

Method: A systematic search across PubMed, Science Direct, and Cochrane identified 25 studies involving 22,706 patients with early-stage NSCLC. Comparative analyses were performed on primary outcomes (postoperative hospital length of stay [LOS] and postoperative complications [PPCs]) and secondary outcomes (thoracic drainage duration and operation time). Statistical analyses were conducted using R version 4.5.0 and MetaInsight v6.4.2. Treatment hierarchy and comparative effectiveness were assessed using Surface Under the Cumulative Ranking Curve (SUCRA) scores, while publication bias was evaluated using Funnel plot and Egger’s test.

Result: NIVATS demonstrated superior outcomes compared to both iVATS and RATS. For postoperative hospital LOS, NIVATS significantly reduced stay duration compared to iVATS (Mean Difference [MD]: -1.05 days; 95% Credible Interval [CrI]: -1.76 to -0.35) and RATS (MD: -0.69 days; 95% CrI: -1.48 to 0.18). SUCRA rankings identified NIVATS as the best modality for shortening hospital stay (97.13%). Regarding PPCs, NIVATS significantly reduced complication rates compared to iVATS (Odds Ratio [OR]: 0.42; 95% CrI: 0.18 to 0.92) and RATS (OR: 0.40; 95% CrI: 0.18 to 0.92), ranking highest in safety (SUCRA: 98.65%).

Conclusion: NIVATS represents the next frontier in ultra-minimally invasive thoracic surgery. By eliminating the morbidity associated with endotracheal intubation, NIVATS offers superior short-term recovery and lower complication rates compared to traditional iVATS and RATS for early-stage NSCLC.

Keywords: Non-small cell lung cancer; NIVATS, iVATS, RATS, Network Meta-Analysis

Telerehabilitation in Post-Cardiac Surgery Patients, Current Landscape, Outcomes, and the Emerging Role of Artificial Intelligence: A Systematic Review

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Background/Introduction: Patient-centered and personalized care is the future of healthcare innovation. Cardiac rehabilitation is a concise program that has the potential to be developed further along advancing technology. Achieving personalized care with telerehabilitation and artificial intelligence (AI) may improve patients adherence, functional capacity, and overall quality of life in post-cardiac surgery patients undergoing rehabilitation.

Objectives: To implement prospects of telerehabilitation models and artificial intelligence, for post-cardiac surgery patients participating in cardiac rehabilitation programs.

Method: This systematic review followed PRISMA guidelines. Literature search conducted in PubMed, Cochrane, and ScienceDirect. Terms used are coronary artery bypass graft (CABG), telerehabilitation, home-based, remote, or virtual rehabilitation. Inclusion criteria included adult patients diagnosed with coronary artery disease and post-cardiac surgery, studies discussing technology-assisted rehabilitation interventions, and studies published between 2018 and 2026. Three independent reviewers screened and extracted all required data such as authors, year, design, sample size, and outcomes.

Result: A total of eight studies were included, with sample sizes ranging from 7 to 536. Telerehabilitation is well tolerated and established high adherence to the 12 week cardiac rehabilitation program. AI dialogue systems were found helpful and achieved 100% physician-adjudicated accuracy in all 891 simulated rounds, and managed to prevent all prohibited queries to users. Rural islands trials found all participants could operate devices to access telerehabilitation without difficulty. Functional capacity, measured using the 6-minute walk test (6MWT) and peak VO₂, improved consistently with telerehabilitation. The telerehabilitation group achieved a higher quality of life score and an improvement in overall Coronary Revascularisation Outcome Questionnaire scores and

therapeutic self-care measured at 3 and 6 months follow up period during rehabilitation.

Conclusion: Telerehabilitation and AI dialogue systems enhance existing cardiac rehabilitation programs, with consistent improvement in functional capacity and quality of life. Geographically restricted populations can benefit from telerehabilitation. AI conversational agents have potential usability, signaling the future of personalized care.

Keywords: Telerehabilitation; Cardiac Rehabilitation; Cardiac Surgery; Coronary Artery Bypass Grafting; Artificial Intelligence

Redictors of One-Year Primary Functional Patency Failure in Newly Created Arteriovenous Fistulas: A Retrospective Cohort Study

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Background/Introduction: The arteriovenous fistula (AVF) remains the access of choice for hemodialysis (HD), but an uncomfortable share of fistulas fail within the first year.

Objectives: This retrospective cohort study aims to measure the success rate of primary functional patency of AVF at 12 months and to identify early clinical predictors that could potentially trigger hemodialysis access failure.

Method: We reviewed every consecutive AVF created at our centre across twelve months. Patients who died before the fistula had a chance to mature were set aside, because their access outcome could never be observed. Our endpoint was failure of one-year primary functional patency, taken as any abandonment, confirmed thrombosis, or need for an intervention during the first year. Rates are given with Wilson 95% confidence intervals (CI); baseline factors were tested against the outcome with chi-square or Fisher exact tests.

Result: Of 161 records, 124 fistulas were analyzable (mean age 49.5 ± 12.1 years; 67% men; 90% already on dialysis at creation). One-year primary functional patency was 84.6% (95% CI 77.1–89.9). Even so, almost a quarter of accesses (23.6%) met the failure definition: thrombosis 10.6%, intervention 13.0%, abandonment 13.0%. Neither diabetes (odds ratio 0.67; p=0.44) nor fistula location (forearm versus

upper-arm, $p=0.70$) nor age band tracked with failure. Upper-arm fistulas dominated practice (85.5%).

Conclusion: Most fistulas worked at one year, yet roughly one in four needed help to get there. The study's value lies in its complete, unselected twelve-month sampling and a clinically honest composite endpoint; its weaknesses are the single centre, the modest numbers, the lack of vessel imaging, and outcome dates too coarse for survival analysis, all of which leave the "no predictor found" result underpowered rather than settled.

Keywords: AVF, patency, risk factor, hemodialysis, vascular access.

Ambulatory Management Versus Underwater Seal (Wet) Drainage in the Management of Spontaneous Pneumothorax: A Systematic Review and Meta-Analysis

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Background/Introduction: Spontaneous pneumothorax is classified as primary (PSP), occurring without underlying lung disease, or secondary (SSP), arising in patients with pre-existing pulmonary conditions. Standard management involves chest tube insertion connected to an underwater seal drainage system requiring hospitalization. Ambulatory management using one-way valve devices has emerged as a potential alternative to reduce hospitalization and improve comfort, but comparative evidence on efficacy and safety remains limited and inconsistent.

Objectives: To compare hospital stay, procedures needed, adverse events, pain level, and mobility between ambulatory management and underwater seal drainage in spontaneous pneumothorax.

Method: This systematic review and meta-analysis were conducted following PRISMA guidelines. A systematic literature search was performed in PubMed, Cochrane, and

Scopus in May 2026. Four randomized controlled trials met the inclusion criteria. A random-effects meta-analysis was performed for length of hospital stay. Risk of bias was assessed using the Cochrane RoB 2 tool.

Result: The largest trial found ambulatory management of PSP significantly reduced hospital stay, pleural procedures, and 7-day recurrence, though with higher adverse events. No differences were found in pain, breathlessness, or 12-month recurrence. Two smaller PSP trials supported these findings, showing reduced length of stay, faster lung re-expansion, and improved pain and mobility. A SSP trial found no length-of-stay benefit with ambulatory flutter valves, attributed to higher treatment failure rates. Meta-analysis showed a significant pooled reduction in length of stay favouring ambulatory management (MD -3.41 days, 95% CI -5.96 to -0.86; $p=0.009$; $I^2=70.2\%$). Risk of bias was rated as some concerns for three trials and high risk for one underpowered pilot study.

Conclusion: Ambulatory management reduces hospital stay, procedures, and early recurrence in PSP, with better comfort and mobility, but shows no benefit for SSP. It is a reasonable initial strategy for selected PSP patients with adequate follow-up, while conventional management remains standard for SSP.

Keywords: Spontaneous Pneumothorax; Ambulatory Management; Heimlich Valve; Water Seal Drainage; Length of Stay

Toward Precision Pleural Drainage After Lung Resection: A Dose- Stratified Systematic Review and Meta-Analyses of Digital Suction Strategies

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Background/Introduction:

Enhanced Recovery After Surgery/European Society of Thoracic Surgeons guideline recommend digital chest drainage after lung resection but do not define optimal suction levels, a gap not resolved by prior narrative reviews.

This review pools outcomes across predefined suction levels with risk-of-bias assessment.

Objectives: To compare predefined digital chest drainage suction levels and their effects on postoperative outcomes after lung resection.

Method: A PRISMA 2020-compliant systematic review (PubMed, Scopus, Cochrane) was conducted through June 2026. Eligible studies evaluated predefined levels of digital chest drainage suction after lung resection reporting air leak duration, prolonged air leak (PAL), chest drain duration, length of stay, or complications. Suction was classified as near-physiologic (NPS, -2 to -4 cmH $_2$ O), low (LS, -5 to -10 cmH $_2$ O), and standard (SS, -11 to -20 cmH $_2$ O). Primary outcomes were pooled using random-effects models.

Result: Seven studies (4 RCTs, 3 cohorts; $n=1007$) were included. Risk of bias was 'some concerns' for three RCTs, 'high' for one, and serious-to-critical for cohorts. Two RCTs ($n=254$, LS vs SS) showed no difference in PAL (RR 0.94, 0.39–2.27), drain duration (MD -5.88 hours, -16.17 – 4.41), or length of stay (MD -0.06 days, -0.49 – 0.37), but LS had more pleural-space reinterventions. One high-risk-of-bias RCT ($n=222$) showed NPS reduced air leak and drainage duration versus LS without increasing complications, while two other studies (RCT $n=100$; cohort $n=120$) found no efficacy difference between NPS and SS, though NPS showed higher subcutaneous emphysema in the cohort. Observational data suggested shorter air leak duration with lower pressures.

Conclusion: SS shows no efficacy advantage over LS but is associated with fewer reinterventions. NPS evidence is limited and inconsistent, suggesting potential efficacy but with complication concerns, warranting an individualized strategy. Heterogeneous observational data suggest potential benefit from lower pressures, though this remains hypothesis-generating. Standard suction remains a reasonable default pending adequately powered trials.

Keywords: digital chest drainage; suction pressure; lung resection; air leak; postoperative outcomes

Surgical Stabilization of Rib Fractures (SSRF) Using Rib Clip Fixation via Lateral Thoracotomy in Concomitant Flail Chest with Hemathorax and

Thoracolumbar Fracture Induced Paraparesis: A Case Report

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Background: Flail chest is a life threatening consequence of blunt thoracic trauma. Increasing evidence supports Surgical Stabilization of Rib Fractures (SSRF) for improving chest wall mechanics, reducing ventilator dependence, and decreasing pulmonary complications. However, on the preferred operative sequence between thoracic stabilization and spinal decompression in polytrauma patients with thoracolumbar fractures complicated by acute neurological deficits remains a matter of clinical uncertainty. This case highlights the multidisciplinary management of concomitant flail chest with hemothorax and thoracolumbar fracture induced paraparesis using rib clip fixation via lateral thoracotomy followed laminectomy, illustrating a practical integrated surgical strategy for clinical challenging.

Case Illustration/Description: We report a case of a 52 years old male who sustained a high energy lateral fall from a five meter height. At presentation, the patient exhibited hemodynamic instability (BP 100/70 mmHg, HR 112 bpm, RR 23x/min), alongside bilateral lower extremity weakness (hip flexion 3/5), urinary retention, and inability to pass flatus reflecting acute thoracolumbar spinal cord injury. Chest examination revealed paradoxical movement of the left thoracic wall, reduced tactile fremitus, and percussion dullness consistent with hemothorax, corroborated by chest radiograph demonstrating multiple segmental rib fractures (left ribs V–VIII), multiple closed fractures of T12, L1, and L2 vertebrae, and left hemothorax. Laboratory investigations revealed normochromic normocytic anemia (Hb 8.7 g/dL), hypalbuminemia (2.6 g/dL), and electrolyte derangements (hyponatremia 127.6 mEq/L, hypochloremia 96.8 mEq/L, hypocalcemia 8.53 mg/dL). Arterial blood gas analysis revealed acute respiratory failure (P/F ratio 181), necessitating pre-operative mechanical ventilation in the ICU for 48 hours prior to definitive surgery. A combined operative strategy was subsequently employed, comprising SSRF using rib clip fixation via left lateral thoracotomy with simultaneous chest tube insertion, followed by laminectomy.

Conclusion: SSRF using rib clip fixation provided effective multidisciplinary management, restoring chest wall stability while enabling timely spinal decompression. Adequate pre-operative stabilization remains paramount prior to definitive surgical intervention.

Keywords: Rib Fracture, Flail Chest, Thoracolumbal Injury, Polytrauma, SSRF

Congenital Heart Anomalies in Indonesia, 1990–2023: Lessons from Three Decades of Mortality, Disability, and Early-Life Burden

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Background/Introduction: Congenital heart anomalies (CHA) are among the most important cardiac causes of death in early life. In Indonesia, national progress is often judged by declining mortality rates, yet the clinical relevance depends on where the remaining burden occurs: in infancy, childhood, or later life.

Objectives: We examined three decades of CHA mortality, disability, and prevalence in Indonesia, with emphasis on whether fatal and disabling burden remains concentrated in the neonatal and under-five periods.

Method: We analysed Global Burden of Disease (GBD) 2023 estimates for Indonesia from 1990 to 2023. Age-standardized rates (ASR) per 100,000 and all-age counts were extracted for deaths, disability-adjusted life years (DALY), and prevalence with 95% uncertainty intervals. Temporal change was summarized using percentage change and estimated annual percentage change (EAPC). Neonatal, infant, and under-five age-banded counts were used to identify the dominant clinical window of burden.

Result: CHA mortality declined, but the improvement was modest. Mortality ASR decreased from 6.5 per 100,000 in 1990 to 5.4 in 2023, representing a 16.3% reduction, with an EAPC of $\hat{\rho}1.17\%$ (95% confidence interval $\hat{\rho}1.38$ to $\hat{\rho}0.96$). DALY ASR declined by 16.6%, whereas prevalence ASR remained essentially stable. Absolute prevalence increased from 357,115 to 468,406 cases, a 31.2% rise. In 2023, 79.6% of deaths occurred before age five, including 36.7% within the first 28 days of life. Disability burden showed the same early-life

pattern, with 82.8% of DALYs occurring before age five. Male mortality exceeded female mortality, and Indonesia remained above the global mortality rate.

Conclusion: Over three decades, CHA in Indonesia has not shifted away from early life. The persistent neonatal and under-five concentration of mortality and disability makes earlier recognition, timely referral, and follow-up central priorities for pediatric cardiac care, when intervention pathways are most time-sensitive, clinically decisive, and difficult to recover later.

Keywords: congenital heart anomalies; pediatric cardiac care; neonatal mortality; Global Burden of Disease; Indonesia

Mortality, Disability, and Prevalence of Rheumatic Heart Disease in Indonesia from 1990 to 2023: A Three-Decade Global Burden of Disease Analysis

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Background/Introduction: Rheumatic heart disease (RHD) remains a major cause of adult valvular morbidity in Indonesia. Mortality decline may suggest progress, but it does not necessarily mean that the population living with rheumatic valve disease has become smaller.

Objectives: We examined three decades of RHD mortality, disability, and prevalence in Indonesia, and assessed whether demographic change explains divergence between falling rates and expanding prevalent cases.

Method: We analysed Global Burden of Disease (GBD) 2023 estimates for Indonesia from 1990 to 2023. Age-standardized rates (ASR) per 100,000 and all-age counts were extracted for deaths, disability-adjusted life years (DALY), and prevalence with 95% uncertainty intervals. Temporal change was summarized using percentage change and estimated annual percentage change (EAPC). Adult age-banded counts and population denominators were used to decompose changes in adult RHD counts into population growth, population ageing, and age-specific rate components.

Result: RHD mortality declined substantially. Mortality ASR decreased from 4.3 per 100,000 in 1990 to 1.8 in 2023, a 59.5% reduction, with an EAPC of $\pm 2.25\%$ (95% confidence interval ± 2.40 to ± 2.10). DALY ASR declined by 52.2%. Yet the disease pool expanded. Prevalence ASR was nearly unchanged, decreasing only 2.2%, while prevalent cases increased by 78.1%, from 786,458 to 1,400,743. Female mortality remained higher than male mortality in 2023. The prevalent population shifted toward older adulthood, with the 50–69 year share rising from 12.1% to 18.7%. Decomposition showed that adult prevalent-case expansion was driven chiefly by population growth, outweighing the modest contribution of age-specific rate change.

Conclusion: Indonesia has achieved gains in RHD mortality and disability, but the burden has not receded clinically. A larger and older population is now living with rheumatic valve disease, positioning RHD as an ongoing longitudinal valvular care challenge.

Keywords: rheumatic heart disease; valvular heart disease; Global Burden of Disease; Indonesia; clinical epidemiology

Impact of Pedal Arch Patency on Wound Healing and Limb Salvage Following Infrapopliteal Endovascular Revascularization: A Systematic Review

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Background/Introduction: Pedal arch patency has emerged as a potential determinant of tissue perfusion and clinical outcomes following infrapopliteal endovascular revascularization in patients with chronic limb-threatening ischemia (CLTI). However, evidence regarding its association with wound healing and limb salvage remains limited and heterogeneous.

Objectives: To systematically evaluate the association between pedal arch patency and wound healing and limb salvage following infrapopliteal endovascular revascularization in patients with CLTI.

Method: This systematic review was conducted according to the PRISMA 2020 statement. PubMed, ScienceDirect, Europe PMC, and OpenAlex were searched from database

inception to July 2026. Original English-language observational studies evaluating pedal arch patency or pedal artery revascularization after infrapopliteal endovascular intervention were included. Methodological quality was assessed using the Newcastle–Ottawa Scale (NOS). Of 334 identified records, 247 underwent title/abstract screening, 14 full-text articles were assessed, and seven studies met the inclusion criteria.

Result: Seven observational studies involving 1,950 patients were included. NOS scores ranged from 8 to 9, indicating high methodological quality. Complete pedal arch patency was consistently associated with superior wound healing and limb salvage compared with incomplete or absent pedal arch. Reported wound healing rates ranged from 45.8%–90.0% in patients with complete pedal arch versus 12.5%–69.0% and 20.7%–54.0% in those with incomplete and absent pedal arch, respectively. Limb salvage rates ranged from 93.5%–100% among patients with complete pedal arch. Adjunctive pedal artery angioplasty significantly improved wound healing (57.5% vs. 37.3%; $P=0.003$) and reduced time to wound healing (211 vs. 365 days; $P=0.008$). Meta-analysis was not performed because of heterogeneity in study design, pedal arch classification, outcome definitions, and follow-up duration.

Conclusion: Current evidence from high-quality observational studies suggests that preserved or restored pedal arch patency is associated with improved wound healing and limb salvage following infrapopliteal endovascular revascularization. Although the certainty of evidence remains limited by observational study designs and methodological heterogeneity, pedal arch assessment may

Keywords: Chronic limb-threatening ischemia; Pedal arch patency; Endovascular revascularization; Wound healing; Limb salvage

Anatomy-Directed Conduit Planning for Off-Pump Surgical Revascularization in Diffuse Calcified Triple-Vessel Coronary Artery Disease With Distal Left Anterior Descending Artery Chronic Total Occlusion

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Background: Diffuse calcified triple-vessel coronary artery disease with distal left anterior descending artery chronic total occlusion presents substantial technical challenges for surgical revascularization. In complex coronary anatomy, conduit selection and graft configuration often require individualized planning beyond routine bypass strategies, particularly during off-pump coronary artery bypass surgery.

Case Illustration/Description: A 65-year-old woman with hypertension and type 2 diabetes mellitus presented with Canadian Cardiovascular Society class III angina. Coronary angiography demonstrated a normal left main coronary artery; diffuse heavily calcified disease involving the left anterior descending artery from the proximal to distal segments with distal chronic total occlusion and bridging collateral filling from the first diagonal branch; diffuse left circumflex disease with 99% proximal stenosis; and a dominant right coronary artery with serial severe stenoses (90% proximal, 70% mid, and 99% distal). Left ventricular ejection fraction was approximately 50%. Because of diffuse lesion complexity, percutaneous coronary intervention was considered unsuitable. Off-pump coronary artery bypass surgery was performed using the left internal mammary artery to the left anterior descending artery, a saphenous vein graft to the posterior descending artery, and a saphenous vein graft to the obtuse marginal branch continued as a composite Y-graft to the diagonal branch. The conduit configuration was individualized according to the intraoperative coronary anatomy and target vessel characteristics to achieve revascularization of the major coronary territories. The postoperative course was uneventful, with early extubation, stable haemodynamics, and no major in-hospital complications.

Conclusion: This case illustrates that successful off-pump surgical revascularization in diffuse multivessel coronary artery disease depends not only on technical graft construction but also on anatomy-directed conduit planning. Individualized graft configuration may provide a practical strategy when conventional graft allocation is challenged by diffuse coronary involvement and complex target vessel anatomy.

Keywords: Off-pump coronary artery bypass; Composite Y-graft; Chronic total occlusion; Diffuse coronary artery disease; Surgical revascularization

Outcomes of Alternative Autologous Venous Conduits Compared to Great Saphenous Vein in Lower Extremity Bypass: A Systematic Review and Meta-Analysis

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Background/introduction: The great saphenous vein (GSV) is the preferred conduit for infrainguinal lower extremity bypass (LEB) in chronic limb-threatening ischemia (CLTI), yet 25–45% of patients lack a suitable GSV. Alternative autologous veins (AAVs) are frequently used, but their comparative effectiveness remains uncertain.

Objectives: To compare the clinical outcomes of AAVs and GSV for infrainguinal LEB in patients with CLTI.

Method: A systematic review and meta-analysis were conducted in accordance with the PRISMA 2020 guidelines. PubMed, ScienceDirect, and ClinicalTrials.gov were searched for comparative studies evaluating AAVs versus GSV in adult CLTI patients undergoing infrainguinal LEB. Outcomes included graft patency, limb salvage, major adverse limb events (MALE), reintervention, and mortality. Risk of bias was assessed using the RoB 2 or ROBINS-I tools. Data were pooled as hazard ratios (HRs) or risk ratios (RRs) with 95% confidence intervals (CIs) using R software.

Result: Fourteen comparative studies were included. Meta-analysis demonstrated no significant difference between AAVs and GSV in short-term primary patency (RR 0.85, 95% CI 0.69–1.04; $p=0.11$), short-term limb salvage (RR 0.98, 95% CI 0.94–1.03; $p=0.45$), long-term limb salvage (RR 1.05, 95% CI 0.94–1.16; $p=0.40$), major adverse limb events (RR 1.18, 95% CI 1.00–1.39; $p=0.06$), reintervention (RR 1.28, 95% CI 0.97–1.68; $p=0.08$), short-term mortality (RR 0.70, 95% CI 0.40–1.24; $p=0.22$), and long-term mortality (RR 0.99, 95% CI 0.89–1.09; $p=0.82$).

Conclusion: AAVs provide overall clinical outcomes comparable to GSV for infrainguinal LEB when a suitable GSV is unavailable. Future prospective multicenter studies and adequately powered randomized trials with standardized conduit classification and long-term follow-up are warranted.

Keywords: Chronic limb-threatening ischemia; lower extremity bypass; great saphenous vein; alternative autologous vein; systematic review; meta-analysis.

Arch Involvement and Cannulation Strategy in Neurologic Risk After Aortic Surgery

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Background/Introduction: Neurologic complications remain among the most consequential adverse events after aortic surgery. Although arterial cannulation strategy is often evaluated as a single technical exposure, its neurologic safety may vary according to aortic extent, particularly arch involvement.

Objectives: To evaluate whether aortic arch involvement modifies the association between cannulation strategy and postoperative neurologic complications after aortic surgery.

Method: We performed a retrospective cohort study of adults undergoing aortic surgery with cardiopulmonary bypass from 2017 to 2025. Cannulation strategy was classified as central/aortic or femoral-based. The primary outcome was a composite neurologic event comprising stroke >72 hours, transient neurologic deficit, or coma ≥24 hours. The primary analysis compared neurologic outcomes across cannulation strategies stratified by arch involvement and assessed effect modification on additive and multiplicative scales.

When collateral completes the circle: A rare complete vascular ring formed by the aberrant right subclavian artery and MAPCA

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Background: A complete vascular ring occurs when both the trachea and esophagus are encircled and compressed by vascular structures or their remnants. An aberrant right subclavian artery (ARSA) may cause compression to both trachea and esophagus, but very rarely forms a complete vascular ring.

Case Illustration/Description: We present a rare case of a complete vascular ring formed by ARSA and major aortopulmonary collateral artery (MAPCA) arising from the ARSA to the right pulmonary artery in a 1-year-old girl with pulmonary atresia and ventricular septal defect (PA-VSD). The patient underwent a central shunt procedure with a 4 mm IMPRA vascular graft and division of the MAPCA from ARSA to the right pulmonary artery.

Conclusion: The complete ring is successfully released without the need to translocate or bypass the subclavian artery. Following surgery, the patient showed an improved oxygen saturation and a good pulse on her right arm. The patient was extubated on post-operative day 9.

Keywords: aberrant right subclavian artery, major aortopulmonary collateral artery, complete vascular ring

Risk-Stratified Bayesian Network Meta-Analysis of Pharmacological Prophylaxis for Postoperative Atrial Fibrillation After Cardiac Surgery: Comparative Effectiveness, Timing Effects, and Net Clinical Benefit

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Background/Introduction: Postoperative atrial fibrillation (POAF) complicates 20-50% of cardiac surgery and independently increases stroke, prolonged hospitalization, and mortality. Baseline POAF rates vary widely across trials

(0–64%), yet prophylaxis is applied uniformly regardless of patient risk.

Objectives: To compare pharmacological POAF prophylaxis across baseline risk strata and evaluate administration timing as an effect modifier.

Stem Cell Therapy for Hypoplastic Left Heart syndrome: Systematic Review and Meta-analysis of Clinical Outcomes

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Background/Introduction: Hypoplastic left heart syndrome is associated with significant mortality and morbidity despite staged surgical palliation. Stem cell therapy has been proposed as a possible adjunctive therapy to improve cardiac function and clinical outcomes.

Objectives: To explain clinical outcome using Stem Cell Therapy for Hypoplastic Left Heart syndrome

Method: We performed a systematic review and meta-analysis according to PRISMA 2020 guidelines. PubMed, Cochrane Central, Scopus, Semantic Scholar and EuropePMC were searched for studies published from 2016 to 2026. Included studies were human clinical studies evaluating stem cell therapy in HLHS that had extractable quantitative outcomes. Risk of bias was assessed with RoB 2, ROBINS-I and MINORS as appropriate.

Result: Five studies with 133 patients met the inclusion criteria. Overall, stem cell therapy seemed feasible and safe, with no reports of malignant arrhythmias, myocardial tumors, or treatment-related deaths. Meta-analysis of 3 studies showed no significant difference in mortality between groups (OR 0.92, 95% CI 0.20–4.29; P=0.92). The meta-analysis of two studies showed a numerically higher rate of serious adverse events in the stem cell group, but this did not reach statistical significance (OR 2.11, 95% CI 0.97–4.61; P=0.06). No consistent improvement in primary right

ventricular functional endpoints was seen, although secondary outcomes indicated a potential clinical benefit.

Conclusion: Stem cell therapy for HLHS appears feasible and relatively safe, but current data are limited by small sample size, heterogeneous protocols, and short follow-up. More large multicenter randomized trials with standardized outcomes are needed to determine its real clinical value.

Keywords: Hypoplastic left heart syndrome, stem cell, clinical outcome

Atherectomy Plus Drug-Coated Balloon Angioplasty versus Drug-Coated Balloon Angioplasty Alone for Below-the-Knee Lesions in Chronic Limb-Threatening Ischemia: A Systematic Review and Meta-Analysis

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Background/Introduction: Chronic limb-threatening ischemia (CLTI) due to below-the-knee (BTK) arterial disease remains challenging to treat because of diffuse atherosclerosis and heavy calcification which may limit the efficacy of drug-coated balloon (DCB) angioplasty. Atherectomy has been proposed to improve vessel preparation and drug delivery.

Objectives: To evaluate the comparative efficacy and safety of atherectomy followed by drug-coated balloon (DCB) angioplasty versus drug-coated balloon angioplasty alone in patients with chronic limb-threatening ischemia (CLTI) undergoing endovascular treatment for below-the-knee (BTK) arterial lesions through a systematic review and meta-analysis.

Method: We conducted a systematic review and meta-analysis following PRISMA 2020 guidelines. We searched PubMed, Cochrane CENTRAL, Scopus, Semantic Scholar and Europe PMC for human comparative studies from 2016 to 2026 comparing atherectomy plus DCB (A+DCB) versus DCB alone in CLTI patients with BTK lesions. Risk of bias was

assessed using RoB 2 and Newcastle-Ottawa Scale as appropriate.

Result: Five studies including 390 patients were included. A+DCB was associated with better vessel patency (OR 2.52, 95% CI 1.22–5.22; $P=0.01$), lower 12-month CD-TLR (OR 0.43, 95% CI 0.20–0.95; $P=0.04$), lower 24-month CD-TLR (OR 0.30, 95% CI 0.14–0.61; $P=0.001$), and lower major amputation (OR 0.34, 95% CI 0.12–0.97; $P=0.04$). There was no significant difference in all-cause mortality between the groups (OR 0.41, 95% CI 0.15–1.10; $P=0.08$).

Conclusion: Among CLTI patients with BTK lesions, atherectomy plus DCB seems to improve patency and decrease reintervention and major amputation compared to DCB alone without a clear mortality benefit. The evidence, however, is limited by small sample size, heterogeneous study designs and relatively short follow-up.

Keywords: Chronic limb-threatening ischemia; Below-the-knee disease; Atherectomy; Drug-coated balloon; Meta-analysis.

Vascular Neoplasm Presenting as a Chest Wall Tumor with Costal Involvement: A Case Report

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Background: Chest wall tumors are uncommon and comprise a heterogeneous group of lesions ranging from benign to malignant entities. Their clinical and radiologic appearances may overlap, particularly when the mass is large, painful, fixed, and associated with suspected invasion of adjacent structures. In such cases, definitive diagnosis is often challenging preoperatively, and management may require extensive resection with multidisciplinary reconstruction. We report a rare vascular neoplasm presenting as a chest wall tumor with thoracoabdominal extension and costal involvement.

Case Illustration/Description: 26-year-old man presented with a progressively enlarging left thoracoabdominal wall mass for four years, accompanied by increasing pain during the last year. Physical examination showed an ill-defined, fixed, and tender mass. Contrast-enhanced CT

demonstrated a heterogeneous solid mass extending from the left anterior hemiabdomen into the intraperitoneal region, involving the left rectus abdominis muscle, with suspected adhesion to the liver capsule. The patient underwent exploratory laparotomy, wide excision of the mass, adhesiolysis, rectus abdominis transection, resection of the left 10th rib and xiphoid, anterior diaphragmatic repair, left intrapleural chest tube insertion, and reconstruction by a multidisciplinary team involving digestive, thoracic, and plastic surgeons. Histopathological examination revealed epithelioid hemangioma, angiolymphoid hyperplasia with eosinophilia subtype.

Conclusion: This case highlights that rare benign vascular neoplasms may closely mimic invasive chest wall tumors. In patients with suspected costal and diaphragmatic involvement, a multidisciplinary surgical approach is essential for complete resection, definitive diagnosis, and restoration of structural integrity. Such cases emphasize the importance of considering unusual vascular tumors in the differential diagnosis of chest wall masses.

Keywords: Chest wall tumor; epithelioid hemangioma; thoracoabdominal mass

Safety and Efficacy of Fully Biodegradable Occluders for Ventricular Septal Defect and Atrium Septal Defect Closure : A Systematic Review and Meta Analysis Cohort Study

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Background/Introduction: Atrial septal defect (ASD) and ventricular septal defect (VSD) are among the most common congenital heart defects requiring transcatheter closure. Conventional metallic occluders provide high procedural success, but concerns remain regarding long-term complications such as conduction abnormalities and valve interference. Fully biodegradable occluders have emerged as an alternative strategy designed to provide temporary structural support during defect closure.

Objectives: This systematic review and meta-analysis evaluated the safety and efficacy of fully biodegradable occluders for ASD and VSD closure.

Method: This systematic review and meta-analysis followed PRISMA guidelines. Major databases were searched for prospective cohort studies evaluating fully biodegradable occluders for transcatheter ASD or VSD closure. Primary efficacy outcomes included successful closure and residual shunt. Safety outcomes included conduction abnormalities or arrhythmias and device-related complications. Pooled event rates with 95% confidence intervals were synthesized using random-effects models.

Result: Six prospective cohort studies were included, comprising three ASD (n=91) and three VSD (n=67). For ASD, pooled random-effects analysis showed a high successful closure rate of 0.99 (95% CI 0.54–1.00; $I^2=0.0\%$), with low pooled adverse event rates across safety outcomes (0.000–0.044). For VSD, the pooled successful closure rate was likewise very high at 1.00 (95% CI 0.00–1.00; $I^2=0.0\%$), with adverse event rates ranging from 0.00 to 0.03. Residual shunts were infrequent during follow-up, conduction abnormalities and arrhythmias were rare and predominantly transient, and no major device-related complications were reported. Overall, heterogeneity was low across outcomes, supporting consistent safety and efficacy profiles of fully biodegradable occluders for ASD and VSD closure.

Conclusion: Fully biodegradable occluders demonstrate high procedural success rates with low incidences of residual shunt, arrhythmia, and major device-related complications for ASD and VSD closure, suggesting favorable safety and efficacy profiles compared to conventional septal defect closure approaches.

Keywords: Biodegradable occluder; Atrial septal defect; Ventricular septal defect; Congenital heart disease

Catheter-Directed Therapies in Acute Pulmonary Embolism: A case report

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Background: Pulmonary embolism (PE) is a common acute cardiovascular condition associated with significant morbidity and mortality. Clinical presentations range from mild symptoms to severe hemodynamic compromise and cardiogenic shock. ¹ Catheter-directed therapy (CDT) has emerged as an alternative treatment for patients with intermediate-high-risk or high-risk PE when systemic thrombolysis is contraindicated or has failed. ²

Case Illustration/Description: A 58-year-old woman admitted to the intensive care unit was referred to our department for the management of pulmonary embolism. She had experienced progressive dyspnoea and chest pain for several weeks before admission. Due to persistent hypoxemia despite high-flow nasal cannula support, she required endotracheal intubation and mechanical ventilation. Computed tomography pulmonary angiography revealed extensive thrombi involving the main pulmonary artery and both upper lobar pulmonary arteries. Despite optimal ventilatory support, the patient remained severely hypoxemic and developed hemodynamic instability requiring intensive management. Because of a history of melena, systemic thrombolysis was contraindicated. After multidisciplinary discussion, CDT was performed on the second day of hospitalization. Initial pulmonary angiography demonstrated multiple thrombi within the main and right pulmonary arteries. A 6-Fr pigtail catheter was positioned in the right pulmonary artery, and recombinant tissue plasminogen activator (rtPA)/alteplase was infused locally over a 24-hour period. Following thrombolytic therapy, anticoagulation with unfractionated heparin was initiated and continued until catheter removal. Repeat pulmonary angiography demonstrated markedly improved pulmonary arterial flow with no visible residual thrombus in the treated vessels. Clinically, the patient's respiratory status improved, allowing successful weaning from mechanical ventilation. However, during the subsequent course of treatment, she developed septic shock and progressive multiorgan dysfunction. Despite intensive supportive therapy, the patient ultimately died.

Conclusion: Management of severe PE remains challenging and often requires an individualized, multidisciplinary approach. ³ Although CDT achieved significant

angiographic improvement and facilitated respiratory recovery, the overall outcome was influenced by multiple comorbid and critical illness factors.

Keywords: pulmonary embolism, catheter direct therapy, alteplase

The Role of Intravascular Ultrasound During Iliofemoral Venous Stenting for Symptomatic Non-Thrombotic Iliac Vein Lesions: A Systematic Review

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Background/Introduction: Intravascular ultrasound (IVUS) has become an important adjunct to iliofemoral venous stenting by providing more accurate intraluminal assessment than conventional venography. Beyond lesion detection, IVUS may optimize procedural planning and stent deployment, potentially improving clinical outcomes. However, current evidence is heterogeneous and largely observational.

Objectives: To systematically evaluate the current evidence on the role of IVUS during iliofemoral venous stenting for symptomatic non-thrombotic iliac vein lesions (NIVLs), focusing on diagnostic performance, procedural decision-making, and clinical outcomes.

Method: A systematic literature search of PubMed, ScienceDirect, and Europe PMC was conducted from database inception to June 2026 according to PRISMA guidelines. Studies involving adult patients undergoing IVUS-guided or IVUS-assisted iliofemoral venous stenting for symptomatic NIVLs were included. Eligible studies reported diagnostic, procedural, or clinical outcomes related to IVUS. Study selection, data extraction, and quality assessment were performed independently by two reviewers. Because of substantial clinical and methodological heterogeneity, findings were synthesized qualitatively without meta-analysis.

Result: Among 708 identified records, 583 remained after duplicate removal. Following screening and full-text assessment, seven studies were included. IVUS consistently improved lesion characterization, vessel sizing, and

identification of optimal stent landing zones compared with conventional venography, leading to more appropriate stent sizing and deployment. Comparative studies suggested that IVUS-guided intervention was associated with improved stent patency, fewer reinterventions, and greater symptom improvement. However, the certainty of evidence was limited by predominantly observational study designs and heterogeneous study populations.

Conclusion: Current evidence supports IVUS as a valuable adjunctive imaging modality during iliofemoral venous stenting by improving lesion assessment and procedural optimization, with potential benefits for clinical outcomes in symptomatic NIVLs. Prospective comparative studies are needed to define the clinical value of routine IVUS-guided intervention.

Keywords: Intravascular ultrasound; IVUS; non-thrombotic iliac vein lesion; May-Thurner syndrome; iliofemoral venous stenting; systematic review

Preoperative Prophylactic Intra-Aortic Balloon Pump In High-Risk Coronary Artery Bypass Grafting: A Systematic Review And Meta-Analysis

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Background/Introduction: Open cardiac surgery carries substantial perioperative risk, and mechanical haemodynamic support has long been used to mitigate this in high-risk patients. Intra-aortic balloon pump (IABP) is the most widely available mechanical circulatory support device; however, evidence regarding its prophylactic preoperative use in high-risk coronary artery bypass grafting (CABG) remains conflicting.

Objectives: This review aimed to compare 30-day or in-hospital mortality, mechanical ventilation duration, and other perioperative outcomes between prophylactic preoperative IABP and standard care in adult high-risk CABG patients.

Method: A systematic search of PubMed, Cochrane CENTRAL, ProQuest, and SAGE Journals (2016–2026) identified studies comparing prophylactic preoperative IABP with no IABP in adults undergoing high-risk CABG, defined by left

ventricular ejection fraction (LVEF) $\geq 40\%$, left main coronary artery disease, elevated EuroSCORE II, or acute myocardial infarction without cardiogenic shock. Rescue or intraoperative IABP use were exclusion criteria. Both randomised controlled trials and observational studies were eligible for inclusion. Seven studies totalling 4,873 patients were included. Pooled risk ratios (RR) with 95% confidence intervals were estimated using the Mantel-Haenszel random-effects model.

Result: Prophylactic preoperative IABP was not associated with significantly reduced 30-day or in-hospital mortality (pooled RR 1.24, 95% CI 0.80–1.93; $p = 0.34$; $I^2 = 0\%$). Individual studies showed conflicting directional effects: one observational study reported higher adjusted mortality with IABP in a high-risk subgroup, while another reported lower short-term mortality on multivariate analysis. Prolonged mechanical ventilation was consistently more frequent in the IABP group across multiple studies. No significant benefit was demonstrated for low cardiac output syndrome, acute kidney injury, or stroke. Overall certainty of evidence was rated low.

Conclusion: Prophylactic preoperative IABP does not significantly reduce mortality in high-risk CABG patients, and its routine use is not supported by current evidence. The consistent association with prolonged mechanical ventilation warrants caution. Multicentre randomised controlled trials with standardised high-risk criteria are needed.

Keywords: Intra-aortic balloon pump; Coronary artery bypass grafting; High-risk cardiac surgery; Prophylactic mechanical circulatory support; Meta-analysis

Pre-operative Renal Artery Embolization in Nephrectomy due to Renal Malignancy: A Descriptive Study in Single Centre Study

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Background/Introduction: Nephrectomy remains the standard treatment for most localized and resectable renal

malignancies. Pre-operative renal artery embolization (RAE) has been proposed to facilitate tumor resection by reducing intraoperative blood loss and operative complexity, although its clinical role remains controversial.

Objectives: This study aimed to describe the perioperative outcomes of patients undergoing pre-operative RAE before nephrectomy.

Method: A descriptive study with consecutive sampling was conducted between January 2024 and June 2026. Consecutive patients scheduled for radical nephrectomy were enrolled. Perioperative blood loss, operative duration, hospital length of stay, and intensive care unit (ICU) length of stay were evaluated to assess the feasibility and perioperative performance of this treatment strategy.

Result: Twenty-five patients underwent Radial Nephrectomy were included, with a mean age of 63.2 ± 5.86 years. All patients received Vascular Plug as the embolization technique. Mean intraoperative blood loss was 256.3 ± 83.12 mL, and the mean operative duration was 183.2 ± 31.23 minutes. The mean hospital stay was 9.2 ± 3.1 days, while the mean ICU stay was 36.7 ± 5.91 hours. No major perioperative complications related to the embolization procedure were observed during hospitalization.

Conclusion: Pre-operative RAE appears to be a safe and effective adjunct before nephrectomy for renal malignancy. It is associated with low intraoperative blood loss, acceptable operative duration, and favorable postoperative recovery, reflected by relatively short hospital and ICU stays.

Keywords: renal artery embolization; nephrectomy; renal malignancy; clinical outcome

Indocyanine Green Near-Infrared Localization Versus Hookwire Localization for Small Pulmonary Nodules Undergoing Video-Assisted Thoracoscopic Surgery: A Systematic Review and Meta-analysis

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Background/Introduction: Preoperative localization is essential for accurate resection of small pulmonary nodules

during video-assisted thoracoscopic surgery (VATS). Although CT-guided hookwire localization is widely used, it is associated with complications such as pneumothorax and pulmonary hemorrhage. Indocyanine green (ICG) near-infrared (NIR) fluorescence-guided localization has emerged as a promising alternative. However, comparative evidence remains inconclusive.

Objectives: To compare the efficacy and safety of ICG near-infrared fluorescence-guided localization versus CT-guided hookwire localization for small pulmonary nodules undergoing VATS.

Method: A systematic search was conducted in PubMed, Europe PMC, ScienceDirect, Epistemonikos, and Google Scholar from database inception through July 2026. Risk of bias was assessed using the ROBINS-I tool. Meta-analysis was performed using a random-effects model, with pooled risk ratios (RRs) or mean differences (MDs) and 95% confidence intervals (CIs). Statistical heterogeneity was assessed using the I² statistic.

Result: Six comparative retrospective studies involving 405 patients in the ICG group and 378 in the hookwire group. No significant differences were observed in technical success (RR=1.01, 95% CI 0.99–1.02; I²=0%), localization procedure duration (MD=0.13 min, 95% CI ?2.52 to 2.78; I²=94%), or successful wedge/sublobar resection (RR=1.05, 95% CI 0.99–1.11; I²=76%). Compared with hookwire, ICG significantly reduced the risk of pneumothorax (RR=0.50, 95% CI 0.26–0.93; I²=61%) and lung hemorrhage (RR=0.43, 95% CI 0.24–0.79; I²=16%). Funnel plots showed no obvious publication bias, although interpretation was limited by the small number of studies. Four studies had a moderate overall risk and two had a serious overall risk of bias.

Conclusion: ICG near-infrared fluorescence-guided localization provides comparable localization efficacy to CT-guided hookwire localization while significantly reducing the risks of pneumothorax and lung hemorrhage. These findings support ICG as a safer alternative for preoperative localization of small pulmonary nodules undergoing VATS, although further high-quality prospective studies are warranted.

Keywords: Small pulmonary nodule; Indocyanine green; Hookwire localization; Video-assisted thoracoscopic surgery; Near-infrared fluorescence

Uniportal Versus Biportal or Multiportal Video-Assisted Thoracoscopic Sympathectomy for Primary Hyperhidrosis: A Systematic Review and Meta-Analysis

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Background/Introduction: Primary hyperhidrosis is a chronic condition characterized by excessive sweating that can impair quality of life. Video-assisted thoracoscopic sympathectomy (VATS) is an established treatment for refractory cases, but the comparative efficacy and safety of uniportal versus biportal or multiportal approaches remain uncertain.

Objectives: This systematic review and meta-analysis aimed to compare uniportal or single-port VATS with biportal, two-port, or multiportal approaches in patients with primary hyperhidrosis.

Method: A systematic search was conducted in PubMed, ScienceDirect, Europe PMC, and Google Scholar from database inception through July 2026. Randomized and nonrandomized comparative studies were included. Outcomes assessed were length of hospital stay, operation time, postoperative pain, pneumothorax, compensatory sweating, and Horner's syndrome. Effect estimates were pooled using a random-effects model and expressed as mean difference (MD) or risk ratio (RR) with 95% confidence intervals. Risk of bias was assessed using RoB 2 and ROBINS-I. Funnel plots were visually assessed where applicable.

Result: Seven studies involving 476 patients, including 254 in the uniportal group and 222 in the biportal or multiportal group, were included. Compared with biportal or multiportal approaches, uniportal thoracoscopic sympathectomy significantly reduced operation time (MD ?6.50 minutes; 95% CI ?9.92 to ?3.08; p=0.0002; I²=88%) and postoperative pain (RR 0.57; 95% CI 0.41 to 0.79; p=0.0008; I²=0%). No significant differences were found in length of hospital stay, pneumothorax, compensatory sweating, or Horner's syndrome. Funnel plot interpretation was limited by the small number of studies per outcome. Risk of bias was rated as some concerns in all randomized studies and moderate in all nonrandomized studies.

Conclusion: Uniportal thoracoscopic sympathectomy may be an effective and safe alternative, offering shorter operation time and less postoperative pain with comparable safety outcomes. Further large-scale randomized studies with standardized outcome reporting are needed to confirm these findings.

Keywords: Primary hyperhidrosis; Thoracoscopic sympathectomy; Uniportal; Biportal/Multiportal; Minimally invasive thoracic surgery

Sutureless or Rapid-Deployment Valves versus Conventional Bioprostheses for Surgical Aortic Valve Replacement in Adults with Small Aortic Annulus: A Systematic Review and Meta-analysis

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Background/Introduction: Surgical aortic valve replacement in small aortic annulus (SAA) is challenging because prosthesis choice affects hemodynamics, operative time, and safety. Sutureless and rapid-deployment valves are alternatives to conventional bioprostheses, but their impact remains unclear.

Objectives: To compare sutureless and rapid-deployment valves with conventional valves in SAA.

Method: PubMed, Scopus, Web of Science, and Epistemonikos were searched for comparative studies. Analyses used a random-effects model, with mean difference (MD) for continuous outcomes and risk ratio (RR) with 95% confidence interval (CI) for dichotomous outcomes. Heterogeneity was assessed using I², publication bias using Egger's test, and risk of bias was evaluated.

Result: Thirteen studies including 2,598 patients were analyzed: 508 sutureless, 482 rapid-deployment, and 1,608 conventional valve recipients. Most studies had moderate risk of bias. Compared with conventional valves, sutureless valves showed no significant difference in mean gradient (MD 0.64 mmHg, 95% CI -1.03 to 2.31), indexed effective orifice area (MD 0.05 cm²/m², 95% CI -0.13 to 0.23), or

moderate/severe patient-prosthesis mismatch (RR 1.15, 95% CI 0.50 to 2.64). Sutureless valves reduced aortic cross-clamp time (MD -24.06 minutes, 95% CI -31.63 to -16.50) and cardiopulmonary bypass time (MD -25.83 minutes, 95% CI -34.89 to -16.77), but increased permanent pacemaker implantation (RR 3.33, 95% CI 2.13 to 5.19). Early mortality and stroke were comparable. Rapid-deployment valves increased indexed effective orifice area (MD 0.08 cm²/m², 95% CI 0.05 to 0.11), without significant differences in other outcomes. Heterogeneity was substantial in hemodynamic and operative outcomes. Publication bias was detected only for sutureless indexed effective orifice area and early mortality.

Conclusion: In adults with SAA, sutureless and rapid-deployment valves distinct efficacy and safety profiles compared with conventional bioprostheses. These findings should be interpreted cautiously because of substantial heterogeneity and the predominance of non-randomized studies.

Keywords: Small aortic annulus; Surgical aortic valve replacement; Sutureless valve; Rapid-deployment valve; Conventional bioprosthesis

Outcome of Pulsatile Versus Non-Pulsatile Perfusion During Cardiopulmonary Bypass in Adult Cardiac Surgery: A Systematic Review and Meta-Analysis

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Background/Introduction: Cardiopulmonary bypass (CPB) is commonly used during cardiac surgery but is associated with impaired organ perfusion and postoperative complications. Pulsatile perfusion may better mimic physiological circulation than conventional non-pulsatile perfusion, although its effects on postoperative outcomes remain unclear.

Objectives: This systematic review and meta-analysis compared pulsatile and non-pulsatile CPB on postoperative renal and clinical outcomes in adult cardiac surgery.

Method: Eight databases were systematically searched. Risk of bias was assessed using RoB 2 for randomized controlled trials and the modified Newcastle-Ottawa Scale for

observational studies. Renal, hemodynamic, perfusion, hepatic, hematological, and clinical outcomes were pooled using random-effects models. Subgroup, meta-regression, publication bias, and leave-one-out sensitivity analyses were performed.

Bilateral Bidirectional Cavopulmonary Shunt in a Child with Double Outlet Right Ventricle, Right Isomerism, and Persistent Left Superior Vena Cava without Innominate Vein: A Case Report of Anatomical Considerations and Surgical Strategy

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Background: Double outlet right ventricle with right isomerism is among the most complex forms of congenital heart disease, frequently associated with single atrium, pulmonary stenosis, and anomalous systemic venous drainage. Persistent left superior vena cava without an innominate vein occurs in up to 65% of PLSVC cases and mandates bilateral bidirectional cavopulmonary shunt, as independent anastomosis of each superior vena cava to its ipsilateral pulmonary artery is required to prevent persistent right-to-left shunting and continued arterial desaturation. The simultaneous occurrence of DORV, right isomerism, single atrium, severe PS, PLSVC without innominate vein, and major aortopulmonary collateral arteries in one patient is exceptionally rare and presents formidable surgical challenges.

Case Illustration/Description: A 3-year-8-month-old girl presented with cyanosis since birth. Echocardiography and cardiac catheterization confirmed DORV with atrioventricular and ventriculoarterial discordance, large inlet ventricular septal defect, single atrium, severe infundibular-valvular PS, right isomerism, PLSVC draining into the left atrium without innominate vein, and two major aortopulmonary collateral arteries. The McGoon ratio was 1.85, meeting the threshold for cavopulmonary candidacy. Biventricular repair was not feasible given the anatomical complexity. Bilateral BCPS was performed. Intraoperatively,

the PLSVC was divided at the left atrial junction and anastomosed end-to-side to the left pulmonary artery; the right superior vena cava was divided at the right atrial junction and anastomosed end-to-side to the right pulmonary artery. Cardiopulmonary bypass was required following intraoperative bradycardia during PLSVC dissection. The azygos vein was ligated to prevent venovenous steal. Postoperative echocardiography confirmed bilateral BCPS flow with preserved ventricular function.

Conclusion: Bilateral BCPS is a safe and effective palliative strategy in DORV with right isomerism and PLSVC without innominate vein. Preoperative venography is indispensable for delineating systemic venous anatomy. Surgical flexibility, including readiness for cardiopulmonary bypass is essential given the risk of intraoperative hemodynamic instability

Keywords: DORV, PLSVC, Bilateral BCPS, Pulmonary Stenosis, VSD

Surgical Correction of Aorto-Pulmonary Fistula with Saccular type Aneurysm and Co-existing Multiple Coronary Artery Fistulas: A Rare Case Report

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Background: Coronary Artery Fistula (CAF) and aortopulmonary fistula are highly rare cardiovascular vascular abnormalities. CAF accounts for approximately 1% of the general population, with multiple fistulae being extremely uncommon, occurring in only up to 16% of cases. Concurrently, an aortopulmonary fistula typically arises as a rare complication from the erosion of a chronic ascending aortic aneurysm. Both conditions induce massive left-to-right shunting and the coronary steal phenomenon without artery stenosis. If left untreated, they can rapidly lead to fatal outcomes, including myocardial ischemia, heart failure, or sudden aneurysm rupture. Definitive management generally requires urgent surgical intervention

Case Illustration/Description: A 60-year-old male was referred with a 2-year history of stabbing left-sided chest pain and exertional dyspnea. The patient had a history of aortopulmonary fistula embolization utilizing an Amplatzer

Vascular Plug (AVP) in 2008. Echocardiography, Computed Tomography Angiography (CTA), and catheter angiography revealed recurrence. Multiple fistulae originated from the proximal left anterior descending (LAD) artery and the first diagonal branch, both draining into the main pulmonary artery (MPA). Additionally, a 41x36.5mm saccular aneurysm arising from the right coronary cusp (RCC) formed a 10.2mm fistula draining into the MPA. The previous AVP was found proximal to the aortopulmonary fistula. Due to the large size, multiple fistulae, and failure of the previous transcatheter procedure, surgical repair was performed. The LAD and diagonal fistulae were manually ligated. The aneurysm was opened, the old vascular plug evacuated, and the aortopulmonary fistula successfully repaired using a 0.6mm Gore-Tex patch. Hemodynamics remained stable postoperatively, and the patient was safely discharged on day four.

Conclusion: The combination of an aortopulmonary fistula associated with an RCC saccular aneurysm and multiple CAFs draining into the MPA represents an exceptionally rare clinical entity. A surgical approach remains the most effective definitive therapy, offering excellent clinical outcomes, particularly in cases of recurrence following failed previous transcatheter closure.

Keywords: Coronary artery fistula; Aortopulmonary fistula; Saccular aortic aneurysm; Surgical repair; Transcatheter closure failure

Floating Aortic Arch Thrombus as a Rare Embolic Source of Acute Upper Extremity Limb Ischemia and Limb Salvage Failure Culminating in Wrist Disarticulation in a Patient with a History of Non-Hemorrhagic Stroke: A Case Report

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Background: Upper extremity acute limb ischemia (ALI) is uncommon, about 1 in 5 ALI cases (incidence 1–3/100,000 person-years), and Indonesian ALI data remain limited. An aortic arch thrombus as embolic source rather

than cardiac origin is rarely reported, especially with history of thromboembolic stroke. We report this rare aortogenic case and its limb salvage-failure determinants.

Case Illustration/Description: A 61-year-old woman with a history of non-hemorrhagic stroke (right occipital infarct) presented with pain, coldness, numbness, and cyanosis of the left hand for 5 days, with absent left radial pulse (Rutherford Grade II). Multislice computed tomography (MSCT) angiography showed a 0.4 x 2.6 cm aortic arch thrombus with multiple left arm vessel stenoses, including subtotal radial stenosis. Echocardiography showed a normal ejection fraction (EF) of 59% without intracardiac thrombus, confirming the aortic arch as the embolic source. Emergency Fogarty thrombectomy successfully achieved proximal patency, but prolonged ischemia and poor distal runoff led to progressive dry gangrene of digits I–III. The surgical team performed wrist disarticulation, secondary thrombectomy evaluation, and debridement after demarcation.

Conclusion: Atrial fibrillation, valvular vegetation, and aortic dissection, alternative etiologies for cerebral-limb thromboembolism, were excluded, the latter by absence of an intimal flap on MSCT, confirming a floating aortic arch thrombus as the shared source. Despite proximal patency acquired, delayed presentation and pre-existing radial stenosis drove limb salvage failure, consistent with literature showing delayed ALI diagnosis significantly lowers limb salvage rates. An aortic arch thrombus should be considered once cardiac and aortic differentials are excluded, particularly with a history of embolic stroke, amid Indonesia's rising stroke burden. Multidisciplinary management and attention to distal runoff remain essential for limb salvage.

Keywords: aortic arch thrombus; upper extremity acute limb ischemia; fogarty thrombectomy; limb salvage failure

Efficacy of hybrid procedure and conventional procedure for patient with aortic arch dissection

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Background/Introduction: Acute aortic arch dissection is a life-threatening condition associated with high morbidity and mortality. Although conventional open repair remains the standard treatment, hybrid aortic arch repair has emerged as less invasive alternative that may improve perioperative outcomes. However, evidence comparing both approaches remains limited.

Objectives: This systematic review aimed to evaluate the effectiveness and safety of hybrid aortic arch repair compared with conventional open surgery in patients with aortic arch dissection.

Method: This systematic review was conducted according to PRISMA guidelines. Literature searches were performed in PubMed, Google Scholar, ScienceDirect, and ProQuest to identify comparative studies evaluating hybrid aortic arch repair for aortic dissection. Eligible studies included patients with Stanford type A or DeBakey type I aortic dissection involving the aortic arch who underwent hybrid repair compared with conventional open surgery. Due to heterogeneity in study design, surgical techniques, and outcome measures, the findings were synthesized narratively.

Result: A total of 478 records were identified, of which three studies involving 810 patients met the inclusion criteria. The included studies consisted of two retrospective comparative cohort studies and one prospective randomized controlled trial published between 2013 and 2025. Hybrid procedures combined supra-aortic debranching with thoracic endovascular aortic repair or retrograde stent-graft implantation, while comparator groups underwent conventional total arch replacement, frozen elephant trunk, or Sun's procedure. Overall, hybrid repair demonstrated comparable or improved perioperative outcomes, including reduced postoperative malperfusion, fewer neurological and systemic complications, enhanced aortic remodeling, and lower distal aortic reintervention rates. One randomized trial also reported improved 30-day survival following hybrid repair.

Conclusion: Hybrid aortic arch repair appears to be a safe and effective alternative to conventional open surgery for selected patients with acute aortic arch dissection. Although current evidence supports improved perioperative

outcomes and favorable aortic remodeling, further multicenter studies with longer followup are required to confirm long-term efficacy and durability.

Keywords: hybrid procedure ; conventional procedure ; aortic arch dissection, efficacy

Clinical Utility and Safety of Intraoperative Molecular Imaging in Lung Surgery: A Systematic Review and Meta-Analysis

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Background/Introduction: Previous studies of tumor-targeted intraoperative molecular imaging (IMI) have primarily focused on fluorescence detection rather than changes in intraoperative decision-making. However, whether this information translates into meaningful changes in surgical management beyond conventional assessment remains uncertain.

Objectives: To evaluate the clinical utility and safety of tumor-targeted IMI during lung resection, using patient-level IMI-attributable management change as the primary outcome.

Method: PubMed, ScienceDirect, Europe PMC, and Epistemonikos were searched through July 2026 for studies evaluating tumor-targeted or activatable fluorescent tracers during lung resection for suspected or confirmed lung malignancy. To avoid double-counting, reports from overlapping publication families were adjudicated and consolidated into independent cohort units before analysis. The primary outcome was IMI-attributable patient-level surgical management change. Secondary outcomes included localization rescue, occult malignant lesion detection, margin-directed action, and tracer-related adverse events. Risk of bias was assessed using outcome-appropriate assessment tools. Random-effects generalized linear mixed models were applied when at least three compatible independent cohorts contributed to an outcome.

Result: Twenty-eight eligible reports were consolidated into 10 independent cohort units. Only two compatible cohorts contributed to the primary outcome, precluding meta-

analysis. These cohorts reported 46 IMI-attributable management changes among 140 patients. Broad clinically significant intraoperative events occurred in 40.0% of patients (95% confidence interval [CI], 29.0%–52.0%). IMI achieved localization rescue in 18.9% (95% CI, 10.6%–31.4%), detected occult malignant lesions in 8.0% (95% CI, 5.2%–12.0%), and prompted margin-directed action in 6.6% (95% CI, 3.6%–11.8%). Any tracer-related adverse event occurred in 9.4%, whereas serious adverse events were rare (0.2%).

Conclusion: Tumor-targeted IMI provides clinically meaningful intraoperative utility, particularly for lesion localization, occult malignant lesion detection, and margin-directed action, with infrequent serious tracer-related adverse events. However, certainty remains limited, and adequately powered comparative studies are needed to establish its clinical role.

Keywords: Intraoperative molecular imaging; pulmonary lesions; lung cancer; clinical utility; management change

Association of Early and Delayed Postoperative Antiplatelet Therapy on Graft Patency and Bleeding After Coronary Artery Bypass Grafting: A Systematic Review and Meta-analysis

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Background/Introduction: Coronary artery bypass grafting (CABG) remains a standard revascularization strategy for advanced coronary artery disease; however, early graft failure, particularly saphenous vein graft occlusion, remains a major postoperative concern. Platelet activation and thrombus formation contribute significantly to early graft failure, supporting the use of postoperative antiplatelet therapy. This study aimed to evaluate the association between early and delayed postoperative antiplatelet therapy with graft patency and bleeding-related outcomes after CABG.

Objectives: To compare the effects of early and delayed postoperative antiplatelet therapy on graft patency and bleeding complications following coronary artery bypass grafting (CABG).

Method: A systematic review and meta-analysis was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Electronic databases were searched for studies comparing early versus delayed or control postoperative antiplatelet therapy after CABG. Studies reporting graft occlusion or bleeding-related outcomes were included. Pooled risk ratios (RRs) with 95% confidence intervals (CIs) were calculated using a random-effects model, with heterogeneity assessed using the I² statistic.

Result: Five studies involving 1,180 patients were included. Postoperative antiplatelet therapy demonstrated a trend toward reduced graft occlusion compared with delayed or control therapy, although the difference was not statistically significant (RR 0.61; 95% CI 0.36–1.03; p = 0.06). Moderate heterogeneity was observed (I² = 64%), reflecting variations in antiplatelet regimens, initiation timing, follow-up duration, and graft assessment methods. Early postoperative antiplatelet therapy was not associated with increased bleeding-related reoperation or re-exploration (RR 0.86; 95% CI 0.17–4.25; p = 0.85).

Conclusion: Early postoperative antiplatelet therapy after CABG may improve graft patency without significantly increasing major bleeding complications. Further randomized controlled trials are required to determine the optimal timing and regimen of antiplatelet therapy after CABG.

Keywords: Coronary artery bypass grafting, antiplatelet therapy, graft patency, saphenous vein graft, bleeding.

Magnesium Sulfate for Prevention of Postoperative Atrial Fibrillation in Patients Undergoing Coronary Artery Bypass Grafting: A Systematic Review and Meta-Analysis

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Background/introduction:

Postoperative atrial fibrillation (POAF) is the most common arrhythmic complication after coronary artery bypass grafting (CABG), associated with prolonged hospitalization



and increased morbidity. Magnesium sulfate has been proposed as a low-cost prophylactic agent, but evidence on its efficacy compared with normal saline or placebo remains inconsistent across randomized studies.

Objectives: To evaluate the effectiveness of magnesium sulfate compared with normal saline or placebo in preventing POAF and reducing length of hospital stay in patients undergoing CABG.

Extra Anatomic Left to Right Internal Jugular Vein Bypass for Aortosternal Venous Compression Syndrome in Hemodialysis Patient

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Background: Aortosternal venous compression syndrome is an uncommon cause of central venous outflow obstruction resulting from extrinsic compression of the left brachiocephalic vein between the manubrium sterni and the aortic arch. In hemodialysis patients with high-flow arteriovenous fistulas, increased venous return may unmask clinically significant obstruction, causing upper-extremity edema, cervicofacial swelling, and venous hypertension despite preserved access function. Because extrinsic compression limits the durability of endovascular treatment, recurrent symptomatic cases may require definitive surgical bypass.

Case Illustration/Description: A 54-year-old woman undergoing maintenance haemodialysis through a functioning left brachiocephalic arteriovenous fistula presented with progressive left upper-extremity swelling for three months despite three previous venoplasty procedures. Physical examination revealed edema of the left upper extremity, neck, and face with excessive tearing of the left eye, without neurological deficits. Computed tomography angiography demonstrated severe extrinsic compression of the left brachiocephalic vein between the manubrium sterni and the aortic arch, while duplex ultrasonography confirmed chronic subtotal thrombosis of the proximal left internal jugular vein. Owing to recurrent

symptoms after repeated endovascular interventions, thrombus evacuation followed by extra-anatomic left-to-right internal jugular vein bypass using a 10-mm vascular graft was performed. The postoperative course was uneventful, with marked resolution of cervicofacial and upper-extremity edema. The patient was discharged on postoperative day six and remained symptomatically improved during follow-up.

Conclusion: In patients with recurrent central venous hypertension despite repeated venoplasty, aortosternal venous compression should be considered. Left-to-right internal jugular vein bypass is an effective definitive treatment that relieves venous congestion while preserving functional hemodialysis access.

Keywords: Aortosternal venous compression syndrome; Extra Anatomic Left to Right Internal Jugular Vein Bypass

Female versus Male Risk of Acute Kidney Injury After Cardiac Surgery with Cardiopulmonary Bypass: A Systematic Review and Meta-Analysis

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Background/Introduction: Acute kidney injury (AKI) is a common and serious complication of cardiac surgery with cardiopulmonary bypass (CPB). Female sex is recognized as a risk factor in many AKI prediction models. However, existing studies raise questions about whether this represents a real biological risk or is merely a result of using serum creatinine-based definitions of AKI. We reviewed and analyzed the effect of sex on cardiac-surgery-associated AKI (CSA-AKI).

Objectives: To evaluate the association between sex and cardiac surgery-associated AKI (CSA-AKI) in adults undergoing cardiac surgery with CPB.

Method: PubMed/MEDLINE, Scopus, and the Cochrane Library were searched for studies published from January 2016 to July 2026 that reported AKI by sex in adults undergoing cardiac surgery with CPB. AKI was defined using KDIGO, AKIN, RIFLE, or renal replacement therapy criteria. Odds ratios were pooled using a random-effects model, and heterogeneity was assessed using I².

Result: The search identified 537 records. After removing 23 duplicates, 514 records were screened, and 13 studies

involving more than 25,000 adults were included. Five studies provided sufficient event data for quantitative synthesis. Overall, female sex was not significantly associated with CSA-AKI (OR 0.84, 95% CI 0.55–1.27; $p=0.41$), with substantial heterogeneity ($I^2=83\%$). In subgroup analyses, the direction of association differed by procedure type, and heterogeneity decreased to 0% within both subgroups. Women had higher odds of AKI after coronary or mixed cardiac surgery (OR 1.34, 95% CI 1.09–1.66) but lower odds after valvular or aortic surgery (OR 0.63, 95% CI 0.50–0.79).

Conclusion: Female sex was not significantly associated with CSA-AKI overall. However, the association appeared to vary by procedure type. These findings may help explain conflicting results in the literature, but should be interpreted with caution given variable AKI definitions and the limited number of studies included in the meta-analysis. Larger studies using standardized AKI criteria and procedure-specific analyses are needed.

Keywords: acute kidney injury; sex; cardiac surgery; cardiopulmonary bypass; sex

Comparative Efficacy of 14-French Pigtail Catheters, 14-French Thal Tubes, and Large-Bore Chest Tubes for Traumatic Hemothorax: A Systematic Review and Network Meta-Analyses of Randomized Controlled Trials

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Background/Introduction: Large-bore tube thoracostomy (≥28–32 French) has traditionally been the standard treatment for acute traumatic hemothorax and hemopneumothorax. However, open tube insertion is associated with greater procedural pain. Although minimally invasive 14-French (14Fr) percutaneous small-bore catheters reduce procedural trauma, it remains uncertain whether pigtail and straight Thal catheter designs differ in drainage failure. This systematic review and network meta-analysis (NMA) evaluated the comparative efficacy and ranking of these drainage strategies.

Objectives: To compare the efficacy of 14-Fr pigtail catheters, 14-Fr straight Thal tubes, and conventional large-bore chest tubes for traumatic hemothorax and hemopneumothorax using a systematic review and network meta-analysis.

Method: PubMed, Embase, Scopus, and Cochrane CENTRAL were systematically searched for randomized controlled trials (RCTs) comparing 14Fr pigtail catheters, 14Fr Thal tubes, and conventional large-bore chest tubes for acute traumatic hemothorax or hemopneumothorax. The primary outcome was drainage failure requiring additional intervention (second catheter, thrombolysis, or video-assisted thoracoscopic surgery [VATS]). Frequentist and Bayesian NMAs were performed, and treatments were ranked using the Surface Under the Cumulative Ranking Curve (SUCRA).

Result: Three RCTs involving 262 patients were included. Compared with the 14Fr straight Thal tube, large-bore chest tubes (Frequentist OR: 0.45, 95% CI: 0.08–2.57; Bayesian OR: 0.42, 95% CrI: 0.04–2.81) and 14Fr pigtail catheters (Frequentist OR: 0.26, 95% CI: 0.04–1.87; Bayesian OR: 0.24, 95% CrI: 0.02–2.09) showed lower odds of drainage failure, although no comparison reached statistical significance. SUCRA ranked the 14Fr pigtail catheter first (87–89%), large-bore chest tubes second (48–50%), and the 14Fr Thal tube third (20%).

Conclusion: In hemodynamically stable patients with traumatic hemothorax or hemopneumothorax, 14Fr small-bore catheters were safe and non-inferior to conventional large-bore chest tubes. Comparative efficacy between catheter designs remains uncertain, although the 14Fr pigtail catheter achieved the highest SUCRA ranking.

Keywords: Thoracic trauma; Hemothorax; Hemopneumothorax; Pigtail catheter; Thal tube; Small-bore; Tube thoracostomy; Network meta-analysis

Primary Versus Delayed Sternal Closure and Early In-Hospital Mortality in Neonates Undergoing the Norwood Operation for Single-Ventricle Palliation: A Systematic Review and Meta-Analysis of Comparative Studies

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Background/Introduction: Delayed sternal closure (DSC) is common after high-complexity neonatal cardiac surgery, whereas primary sternal closure (PSC) is increasingly attempted after the Norwood operation. Whether closure strategy independently affects early outcomes is uncertain, and no pooled comparative analysis exists.

Objectives: To compare in-hospital mortality between PSC and DSC in neonates undergoing the Norwood operation, and to summarize infection outcomes from comparative pediatric cardiac surgery cohorts.

Method: Four databases (PubMed, ScienceDirect, Cochrane, SAGE) were searched from inception to July 2026, yielding 619 records; after removing 28 duplicates and screening 591 records, three single-institution Norwood cohorts with extractable per-arm mortality met inclusion. Series lacking a primary-closure comparator and studies comparing planned versus emergent reopening were excluded. Arm-level mortality was pooled using an inverse-variance random-effects model (DerSimonian-Laird); results are odds ratios (OR) with 95% confidence intervals (CI). Infection outcomes were synthesized narratively.

Massive Transmediastinal Lung Herniation Secondary to Tuberculosis: The Dilemma Between Surgical and Conservative Management

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Background: Acquired, non-traumatic trans-mediastinal lung herniation (TMLH) is an exceedingly rare condition driven by an altered pressure gradient between the two pleural cavities, profoundly altering thoracic anatomy. In the absence of prior trauma/surgery, this severe pressure imbalance is often caused by extensive lung destruction secondary to chronic infections such as Tuberculosis, creating a significant diagnostic challenge with important implications for airway intervention and surgical planning.

Case Illustration/Description: A 32-year-old female presented to the emergency department reporting progressive dyspnea with frequent recent exacerbations. Past medical history was notable for incompletely treated pulmonary tuberculosis 15 years ago. She also has a history of asthma and treated accordingly. Initial vital signs were unremarkable except for a borderline room-air oxygen saturation of 94%. Thoracic auscultation demonstrated faint wheezing accompanied by diminished left-side vesicular breath sounds. A trial of nebulized salbutamol and ipratropium bromide yielded partial relief of dyspnea, without improvement of oxygen saturation. Plain chest radiograph and contrast-enhanced CT demonstrated partial left main bronchus obstruction and left atelectasis, causing a leftward shift of mediastinal structures. These structural changes were attributed to post-tuberculosis scarring and complicated by a left pleural effusion concerning for empyema, with no mass identified. Consequently, the right lung exhibited hyperaeration and herniated to the left hemithorax to compensate for the left lung dysfunction that might have happened chronically. Nonspecific lymphadenopathy supported an infectious etiology. The patient achieved clinical stability through targeted intravenous antimicrobial therapy and strict conservative surveillance. Future bronchoscopy evaluation is planned to further define the airway anatomy and assess the feasibility of future airway intervention.

Conclusion: This case illustrates that in extreme post-TB mediastinal shifts, conservative management is often the most prudent course when surgical intervention carries prohibitive risks. Furthermore, it serves as a stark reminder of the critical importance of complete tuberculosis therapy to prevent such devastating, irreversible pulmonary damage.

Keywords: Trans-mediastinal Lung Herniation; Tuberculosis; Destroyed Lung

Physiologic Reversal of a Supra-Threshold Sucking Chest Wound by an Improvised Three- Sided Occlusive Dressing in a 16-Year-Old Sharp- Force Assault Victim: An Evidence-Based Case Report Adjudicating the ATLS–TCCC Guideline Divergence

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Background: Open pneumothorax turns rapidly lethal once the chest wall defect approaches two-thirds of tracheal diameter, whereupon inspiratory airflow preferentially traverses the wound, not the airway. Management remains guideline-fractured: ATLS-10 retains the three-sided occlusive dressing as a flutter-valve, whereas TCCC withdrew improvised seals in 2008 and NAEMSP now deems them obsolete, favouring vented seals. Yet this divergence rests almost entirely on swine and canine models, no quantified human physiologic dataset exists. The vacuum is widest in low-resource systems, where improvisation is unavoidable.

Case Illustration/Description: A 16-year-old male sustained a posterior right machete assault during a street robbery, reaching the emergency department 20 minutes later without prehospital seal. A 30 mm sucking defect at the eighth intercostal space, threefold his two-thirds tracheal threshold, produced agitation, respiratory rate 33/min, SpO₂ 90% on room air, and heart rate 131/min. Point-of-care ultrasound showed absent right lung sliding with pleural fluid and no pericardial effusion. An improvised three-sided gauze dressing reversed the physiology within 45 minutes (respiratory rate 18/min, SpO₂ 100%, heart rate 68/min) without tension conversion. Final diagnosis: right open traumatic haemopneumothorax from a supra-threshold posterior chest wall vulnus scissum, complicated by chest wall haematoma, subcutaneous emphysema, and persistent alveolar-pleural air leak refractory to 28 Fr tube thoracostomy. He was discharged on day six with an improvised Heimlich valve-reservoir construct, without thoracotomy or thoracoscopy.

Conclusion: This case supplies the human evidence the three-sided-versus-vented controversy has lacked: an improvised valve achieved complete respiratory reversal at a supra-threshold defect despite a demonstrable ongoing air leak, precisely the substrate in which guidelines predict tension conversion. The divergence therefore appears context-dependent rather than hierarchical, reflecting field adhesion failure of commercial seals, not physiologic

inferiority of improvisation. We propose reconceptualising open pneumothorax care as one unidirectional-venting continuum (dressing, water seal, ambulatory Heimlich valve), stratifying guidelines by resource availability rather than declaring obsolescence.

Keywords: Open pneumothorax; Three-sided occlusive dressing; Vented chest seal; Persistent alveolar-pleural air leak; Evidence-based case report

Staged Multidisciplinary Management of Severe Blunt Chest Trauma in a Secondary Referral Hospital: From Emergency Tube Thoracostomy to Definitive Rib Fixation

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1. RSUD Moh Zyn Sampang

Background: Blunt chest trauma is a significant cause of trauma-related morbidity and mortality, accounting for substantial respiratory complications when not managed promptly. Early stabilization followed by definitive surgical management requires effective multidisciplinary collaboration, particularly in secondary referral hospitals where immediate thoracic surgical resources may be limited. We report a case demonstrating a staged multidisciplinary approach to severe blunt chest trauma from emergency stabilization to definitive rib fixation.

Case Illustration/Description: A 55-year-old man presented following a motorcycle collision with progressive dyspnea and right-sided chest pain. On admission, blood pressure was 111/62 mmHg, heart rate 90 beats/min, respiratory rate 28 breaths/min, and body temperature 36.3°C, indicating hemodynamic stability with mild respiratory distress. Physical examination revealed decreased breath sounds over the right hemithorax and subcutaneous emphysema. Chest radiography demonstrated a right simple pneumothorax with multiple displaced fractures of the right third to sixth ribs and an associated right clavicle fracture. Emergency right tube thoracostomy performed by the on-call general surgeon achieved immediate respiratory stabilization, allowing subsequent multidisciplinary assessment. The patient subsequently underwent definitive surgical stabilization of rib fractures on the day of admission by the thoracic and cardiovascular surgery team. During postoperative follow-

up, right lower lobe atelectasis developed despite adequate lung re-expansion and absence of recurrent pneumothorax. Conservative management with multimodal analgesia, bronchodilator therapy, chest physiotherapy, incentive spirometry, and early mobilization was initiated while chest tube drainage was maintained. Serial clinical and radiographic evaluations demonstrated progressive respiratory improvement, and the patient remains hospitalized for continued recovery.

Conclusion: A staged multidisciplinary approach, beginning with emergency tube thoracostomy followed by definitive rib fixation and comprehensive postoperative pulmonary rehabilitation, provides an effective management strategy for severe blunt chest trauma in a secondary referral hospital. This case underscores the importance of coordinated interdisciplinary care in optimizing thoracic trauma management.

Keywords: Multidisciplinary management; chest trauma; Rib Fixation

Open Thoracotomy for Retrieval of an Aspirated Sewing Pin from the Medial Basal Segment of the Right Lower Lobe After Multiple Failed Bronchoscopic Retrieval Attempts: A Case Report

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Background: Foreign body aspiration is a common pediatric thoracic emergency. Although bronchoscopic retrieval remains the gold standard treatment, distally migrated sharp foreign bodies may become inaccessible to endoscopic removal. We report a rare case of an aspirated sewing pin successfully retrieved via open thoracotomy after multiple unsuccessful bronchoscopic attempts.

Case Illustration/Description: A 12 years old female patient with her parents presented to the emergency department with a chief complaint of accidental aspiration of a sewing pin while holding the pin between the lips. The patient initially experienced acute throat pain immediately after the event, which gradually subsided over the following several hours. Initial chest radiography demonstrated a linear radiopaque foreign body projected over the right lower hemithorax. Multiple attempts at bronchoscopic retrieval performed were unsuccessful, suggesting migration of the

foreign body beyond the accessible bronchial lumen. The patient was subsequently referred to thoracic surgery department for definitive surgical management. Following multidisciplinary evaluation, open right posterolateral thoracotomy was planned. Through a right posterolateral thoracotomy via the sixth intercostal space (6th ICS), the thoracic cavity was entered by dividing the chest wall muscles layer-by-layer, followed by blunt entry into the pleural cavity. Intraoperative exploration identified the metallic foreign body embedded within the medial basal segment of the right lower lobe. The sewing pin was successfully retrieved without the need for anatomical lung resection. The sewing pin was successfully retrieved without the need for anatomical lung resection. Hemostasis was secured, a chest tube was placed, and the thoracotomy was closed. The postoperative course was uneventful. The patient was discharged in good clinical condition.

Conclusion: Open thoracotomy remains a safe and effective definitive treatment for distally migrated sharp airway foreign bodies when repeated bronchoscopic retrieval attempts fail. Early recognition of failed endoscopic management and timely surgical intervention are essential to prevent further complication

Keywords: Thoracotomy, Corpus Allineum, Reintervention

Sealing the Leak: Is Autologous Blood Better than Chemical Pleurodesis for Postoperative Air Leak Following Pulmonary Resection? A Systematic Review and Meta-Analysis

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Background/Introduction: Persistent postoperative air leak (PAL) remains a frequent complication after pulmonary resection and is associated with prolonged chest tube drainage, extended hospitalization, and increased postoperative morbidity. Pleurodesis is commonly indicated when conservative treatment fails, with autologous blood patch pleurodesis (ABPP) and chemical pleurodesis representing the two most widely used approaches. Despite their widespread use, comparative evidence regarding their relative effectiveness remains scarce. This systematic

review and meta-analysis evaluated the effectiveness of ABPP compared with chemical pleurodesis in managing postoperative air leak following pulmonary resection.

Objectives: To compare the effectiveness of ABPP and chemical pleurodesis for postoperative air leak following pulmonary resection.

Method: A systematic search of PubMed, ScienceDirect, and Google Scholar was performed to identify randomized controlled trials and cohort studies comparing ABPP with chemical pleurodesis, including glucose, talc, and OK-432. The outcomes of interest were overall air leak cessation, first-attempt treatment success, length of hospital stay, and treatment-related complications. Pooled mean differences (MD) and risk ratios (RR) with 95% confidence intervals (CI) were estimated using a random-effects model.

Clinical Outcomes and Cytokine Modulation with Intraoperative Adsorptive Blood Purification During Cardiac Surgery: A Modality-Stratified Systematic Review and Meta-analysis of Randomized Trials

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Background/Introduction: Cardiopulmonary bypass can provoke systemic inflammatory dysregulation and postoperative organ dysfunction. Intraoperative adsorptive blood purification has been proposed to attenuate this response, but whether cytokine modulation translates into improved patient-centered outcomes remains uncertain.

Objectives: To evaluate whether intraoperative adsorptive blood purification during cardiac surgery with cardiopulmonary bypass improves patient-centered clinical outcomes and modulates inflammatory cytokine responses. This study also aimed to compare the effectiveness of different adsorptive blood purification modalities using evidence from randomized controlled trials.

Method: A systematic review and meta-analysis of randomized controlled trials was conducted by searching PubMed and Scopus. Eligible studies evaluated intraoperative adsorptive blood purification during cardiac surgery with cardiopulmonary bypass. Clinical and biomarker outcomes were analyzed separately according to purification modality. Random-effects models with

restricted maximum likelihood estimation and Hartung–Knapp confidence intervals were used. Risk ratios (RR), mean differences (MD), and standardized mean differences (SMD) were calculated, with prediction intervals reported when at least three estimable studies were available.

Result: Sixteen independent randomized controlled trials involving 1,042 analyzed participants were included. CytoSorb was not associated with significant reductions in 30-day mortality, acute kidney injury, postoperative delirium, renal replacement therapy, hospital length of stay, intensive care unit length of stay, or mechanical ventilation duration. Similarly, HA380 did not significantly improve major clinical outcomes but significantly reduced postoperative interleukin-6 during the early postoperative period and at 24 hours, as well as early postoperative interleukin-10. No significant effects were observed for interleukin-8, tumor necrosis factor- α , or interleukin-10 at 24 hours. Heterogeneity ranged from low to substantial across analyzed outcomes.

Conclusion: Intraoperative adsorptive blood purification did not improve mortality, organ dysfunction, or postoperative recovery outcomes. Although HA380 reduced selected inflammatory cytokines, these effects did not translate into clinical benefits. Further large, modality-specific randomized trials are needed before routine clinical use.

Keywords: Adsorptive blood purification, Hemoadsorption, Cardiac surgery, Cardiopulmonary bypass, Cytokines, Meta-analysis

Comparative Analysis of Clinical Outcomes between Open Surgical Repair and Branched Thoracic Endovascular Aortic Repair for Complex Aortic Arch Pathologies: A Systematic Review and Meta-Analysis

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Background/Introduction: Aortic arch pathologies are traditionally managed through invasive open surgical techniques involving median sternotomy and circulatory arrest, which carry significant risks of morbidity and

mortality. Recent advancements have introduced branched thoracic endovascular aortic repair (bTEVAR) as a less invasive alternative.

Objectives: This study aims to compare the clinical outcomes of open aortic repair (OAR) versus bTEVAR, specifically focusing on complications such as renal impairment, neurological events, and recovery metrics.

Simultaneous Resolution of Refractory Esophageal Variceal Bleeding and Severe Hypersplenism via Total Splenectomy Combined with Proximal Splenorenal Shunt in a Young Patient with Liver Cirrhosis: A Case Report

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Background: Acute esophageal variceal bleeding is a life-threatening complication of portal hypertension in liver cirrhosis, carrying a high mortality rate and substantial risk of recurrence despite standard endoscopic variceal ligation (EVL) and non-selective beta-blocker (NSBB) therapy. When interventional radiology options like Transjugular Intrahepatic Portosystemic Shunt (TIPS) are unavailable, surgical shunting presents a definitive alternative. This case report describes the successful management of refractory variceal bleeding and hypersplenism using a combination of total splenectomy and proximal splenorenal shunt (PSRS).

Case Illustration/Description: A 29-year-old male with liver cirrhosis and portal hypertension (Child-Pugh Class B, score 5) presented with recurrent, massive hematemesis and melena over four years, which remained refractory to routine NSBB therapy and two previous EVL procedures. The bleeding caused severe anemia (hemoglobin level of 4.0–4.4 g/dL), requiring multiple blood transfusions. The patient also exhibited severe hypersplenism characterized by critical thrombocytopenia (47,000/ μ L) and leukopenia (2,620/ μ L). Due to geographical and financial constraints limiting access to TIPS, a collaborative open surgery involving total splenectomy and PSRS was performed.

Postoperatively, portal decompressions prevented further bleeding, and the patient's hematological profile improved rapidly, with platelets rising to 124,000/ μ L and leukocytes to 15,340/ μ L within hours. No recurrent bleeding or signs of hepatic encephalopathy were observed during follow-up.

Conclusion: The combination of total splenectomy and PSRS provides an excellent definitive therapy for cirrhotic patients with refractory variceal bleeding and severe hypersplenism. In patients with preserved liver function and limited access to modern endovascular interventions, this surgical approach offers a crucial dual-benefit outcome.

Keywords: Portal hypertension, Esophageal variceal bleeding, Proximal splenorenal shunt, Splenectomy, Hypersplenism

How Large Is Too Large? The Small-Conduit Penalty and the Oversizing Ceiling in Infant RV-PA Reconstruction: A Categorical and Dose-Response Meta-analysis

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Background/Introduction: Optimal right ventricle-pulmonary artery (RV-PA) conduit size in infants remains uncertain. Small conduits may be rapidly outgrown, while excessive oversizing can distort branch pulmonary arteries and create a separate pathway to reoperation. Existing evidence addresses mainly undersizing risk, leaving the upper boundary of safe oversizing poorly defined.

Objectives: To quantify time-to-event risk from undersized RV-PA conduits versus larger reference conduits, and to identify, from dose-response evidence, the size or z-score range beyond which oversizing stops helping and may begin to harm.

Which RV-PA Conduit Lasts Longer? A Reconstructed Time-to-Event and Competing-Risk Reanalysis in Pediatric RV-PA Reconstruction

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Background/Introduction: Conduit comparisons typically report one pooled hazard ratio, treat death as neutral censoring, and ignore the reintervention pathway a conduit creates for later life, including eventual transcatheter valve replacement. We asked a simple question with better methods: over 2–5 years, does bovine jugular vein (BJV) or cryopreserved homograft actually buy a child more reintervention-free time, and how much does ignoring competing risks distort the answer clinicians are usually given?

Objectives: To compare accumulated reintervention-free time between BJV and homograft conduits, and to test whether standard Kaplan-Meier reporting overstates reintervention risk once competing events, including death, are properly accounted for.

Method: We identified pediatric studies directly comparing BJV and cryopreserved homograft conduits and reconstructed patient-level time-to-event data from published Kaplan-Meier curves. The primary outcome was restricted mean reintervention-free time at 2–5 years, pooled using random-effects meta-analysis. Cohort reporting both Kaplan-Meier and competing-risk estimates was used separately to quantify how much standard survival analysis overstates reintervention probability when death is miscounted as a neutral event.

Result: Five studies (518 reconstructed patients, 94 events) showed no meaningful durability difference between materials: the pooled difference in reintervention-free time was under six weeks at every time point, and the 5-year confidence interval (±8.6 to +6.1 months) was too wide to support a material-based preference (stratified HR 1.22, 95% CI 0.79–1.87; $I^2=69\%$), unchanged by leave-one-out analysis. In the cohort, standard Kaplan-Meier overstated reintervention probability by 1.7 percentage points at 1 year, rising to 7.5 points by 7 years, versus competing-risk analysis. Patient age, conduit size, and pulmonary artery anatomy predicted reintervention more consistently than

material. BJV carried a directionally consistent endocarditis signal.

Conclusion: Material choice does not predict RV-PA durability, and standard survival curves overstate failure by ignoring competing mortality. Selection is better framed around anatomy, size, and infection risk than material hierarchy.

Keywords: RV-PA conduit; BJV; homograft; reintervention

Clinical Outcomes of Endovenous Laser Ablation with 1940 nm versus 1470 nm Wavelength for Treatment of Incompetent Great and Small Saphenous Veins: A Systematic Review

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Background/Introduction: Endovenous laser ablation (EVLA) is increasingly performed using newer 1940 nm lasers as an alternative to the established 1470 nm wavelength.

Objectives: This systematic review compared anatomical and clinical outcomes between the two wavelengths in patients with incompetent saphenous veins.

Method: PubMed, Embase, and Cochrane Library were searched per PRISMA guidelines for trials or observational studies directly comparing 1940 nm and 1470 nm EVLA within the same population. The primary outcome was vein occlusion. Secondary outcomes included pain, complications, functional recovery, and quality of life. Risk of bias was assessed using RoB 2 and ROBINS-I.

Result: Three studies met inclusion criteria; one Randomized Control Trials (RCT) and two retrospective cohorts, comprising 538 patients. Occlusion rates were comparable across wavelengths 1940 nm vs 1470 nm, respectively (RCT: 100% vs 99%; both retrospective:

100% vs 100%); one retrospective reported low recanalization rates (1 case with 1940 nm at 1 year versus 2 cases with 1470 nm at 2 years). Postoperative pain favored 1940 nm in the RCT at 7-day and 1-month follow-up (p

Bullae Ligation versus Stapler Resection for Primary Spontaneous Pneumothorax Associated with Pulmonary Bullae: A Systematic Review and Meta-Analysis of Postoperative Length of Stay

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Background/Introduction: Primary spontaneous pneumothorax (PSP) is commonly treated via video-assisted thoracoscopic surgery (VATS) with stapled bullectomy. However, stapler use increases costs and may prolong hospital stays. Bullae ligation offers a simpler, lower-cost alternative. This meta-analysis evaluated postoperative length of stay (LOS) differences between thoracoscopic ligation and stapler resection for PSP associated with pulmonary bullae.

Objectives: To systematically compare the effectiveness of thoracoscopic bullae ligation versus stapler bullectomy in patients with primary spontaneous pneumothorax, with postoperative length of stay as the primary outcome and operative time, recurrence, complications, and cost as secondary outcomes.

Method: Following PRISMA guidelines, a systematic review was conducted across PubMed, MEDLINE, EMBASE, and the Cochrane Library through August 2025. Comparative studies of VATS ligation versus stapler bullectomy reporting LOS in PSP patients were included. Quality was assessed using the Newcastle–Ottawa Scale. Pooled mean differences (MD) in LOS were calculated via a random-effects model.

Result: Three retrospective studies involving 412 patients (ligation: n = 226; stapler: n = 186) met the inclusion criteria. Pooled analysis demonstrated a modest but statistically significant reduction in LOS for the ligation group compared with the stapler group (MD = -0.50 days; 95% CI -0.94 to -0.06; p = 0.03), with no evidence of heterogeneity (I² = 0%). Ligation was also associated with shorter operative times and lower costs. Recurrence outcomes—reported in a single study—favored ligation. The overall risk of bias was moderate due to the retrospective nature of the data.

Conclusion: Thoracoscopic ligation of pulmonary bullae yields shorter hospital stays than stapler resection, offering

comparable safety and distinct economic advantages. Ligation is a viable alternative for PSP management, particularly in resource-limited settings. Prospective randomized controlled trials are required to validate these findings.

Keywords: primary spontaneous pneumothorax, pulmonary bullae, thoracoscopy, bullectomy, ligation, stapler, length of stay, meta-analysis.

Brachial–Ulnar Artery Bypass with Periarterial sympathectomy for Right Upper Extremity Raynaud’s Disease

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Background: Raynaud’s phenomenon is a vasospastic disorder characterized by episodic digital ischemia precipitated by cold exposure or emotional stress. Chronic upper extremity ischemia is less common than lower extremity ischemia but may present with severe disability and tissue-threatening complications requiring revascularization when medical management fails. Surgical bypass remains an effective option for distal arterial occlusive disease unsuitable for endovascular intervention.

Case Illustration/Description: A 54-year-old male presented to the cardiac, thoracic, vascular surgery clinic with severe pain and progressive discoloration of the right hand for one weeks. The patient reported episodic pallor and cyanosis of the right hand for one weeks. Over the previous one weeks, symptoms progressed to persistent rest pain associated with numbness over the first until fourth fingertips. This patient had End-stage renal disease on maintenance hemodialysis, Type 2 diabetes mellitus, Hypertension uncontrolled. Local examination of right upper extremity: Cyanosis of digits I–IV, Cold extremity distal to the wrist, CRT >4 seconds, Ischemic over distal phalanges of digits I until IV, Diminished radial and ulnar pulse. Positive Allen’s test indicating compromised ulnar circulation. From

Computed Tomography Angio-graphy obtained occlusion of the proximal ulnar artery is 0.95 cm from the bifurcation for 5.3 cm, and occlusion of the distal radial artery 4.79 cm. Operative Procedure Right brachial-to- ulnar artery bypass using reversed autologous great saphenous vein graft with parietal sympathectomy with End-to-side anastomosis. The patient was discharged on postoperative day 5 with: aspirlet 80 mg, beraprost 20 mg, cilostazol 100 mg, Intensive insulin regimen.

Conclusion: This case highlights the successful management of critical upper extremity ischemia secondary to Raynaud's disease in a high-risk patient. Brachial-to- ulnar artery bypass with parietal sympathectomy using reversed great saphenous vein provided effective limb salvage and symptom resolution. Early recognition and timely surgical intervention are essential in preventing irreversible tissue loss in complex upper extremity ischemia.

Keywords: Raynaud disease, brachial- ulnar bypass, diabetes mellitus, hemodialysis, upper extremity ischemia

TRAUMATIC OPEN HEMATOPNEUMOTHORAX WITH PULMONARY LACERATION REQUIRING EMERGENCY THORACOTOMY: A CASE REPORT

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Background: Penetrating thoracic trauma is associated with substantial morbidity and mortality. Although most penetrating chest injuries can be managed with tube thoracostomy, complex injuries involving pulmonary laceration, massive hemothorax, and unstable chest wall fractures often require emergency thoracotomy. Penetrating trauma caused by a detached lawn-mower blade is exceedingly rare and poses significant diagnostic and therapeutic challenges.

Case Illustration/Description: A 39-year-old man presented three hours after sustaining a penetrating injury

to the left hemithorax caused by a detached lawn-mower blade. He complained of dyspnea and left-sided chest pain. Physical examination revealed respiratory distress with a 10 × 4 cm sucking chest wound over the left fifth to sixth intercostal space, decreased breath sounds, and hyperresonance on the left hemithorax. Thoracic ultrasonography demonstrated left pneumothorax, while chest radiography showed left hemopneumothorax with compressive atelectatic changes, subcutaneous emphysema, and fractures of the left fifth through seventh ribs. Following tube thoracostomy, emergency exploratory thoracotomy was performed because of suspected major intrathoracic injury. Intraoperative findings included approximately 1000 mL hemothorax, multiple displaced rib fractures, and a deep laceration of the left lower lobe. Pulmonary segmentectomy, surgical rib fixation, pleural lavage, and chest drainage were successfully performed. The postoperative course was uneventful, with progressive lung re-expansion, successful ventilator weaning, and discharge in good clinical condition.

Conclusion: This case demonstrates that significant intrathoracic injuries may be present despite initial hemodynamic stability in penetrating chest trauma. Early recognition, adherence to trauma management principles, and timely emergency thoracotomy with lung-preserving resection and rib fixation are essential for achieving favorable outcomes in patients with complex open hemopneumothorax.

Keywords: penetrating thoracic trauma, open hemopneumothorax, pulmonary laceration, emergency thoracotomy, segmentectomy, rib fixation.

Ruptured Right Sinus of Valsalva Aneurysm Associated with Supracristal Ventricular Septal Defect and Aortic Regurgitation: A Case Report

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Background: Ruptured sinus of Valsalva aneurysm (RSOVA) is a rare congenital cardiac anomaly that frequently coexists with supracristal ventricular septal defect (SADC VSD). Progressive aneurysmal dilatation and rupture may

result in significant left-to-right shunting, volume overload, aortic valve prolapse, and aortic regurgitation. Early diagnosis and timely surgical intervention are essential to prevent irreversible cardiac remodeling and heart failure.

Case Illustration/Description: A 31-year-old woman presented with progressive exertional fatigue and dyspnea on exertion since 2022. Physical examination revealed a grade III continuous systolic-diastolic murmur at the left parasternal border. Transthoracic echocardiography demonstrated a small supracristal ventricular septal defect measuring 4.1 mm with left-to-right shunt and a ruptured sinus of Valsalva aneurysm with a 6.4-mm rupture orifice producing continuous flow into the right ventricular outflow tract. The left atrium and left ventricle were dilated, while left ventricular systolic function remained preserved (ejection fraction 61%). Transesophageal echocardiography confirmed a ruptured right coronary sinus aneurysm with multiple rupture sites into the right ventricle and associated moderate aortic regurgitation secondary to right coronary cusp prolapse. Cardiac catheterization demonstrated a high-flow, low-resistance shunt with preserved pulmonary vascular resistance. The patient underwent surgical repair consisting of bovine pericardial patch closure of the ruptured sinus of Valsalva aneurysm, surgical closure of the supracristal ventricular septal defect, and patent foramen ovale creation. Postoperative echocardiography demonstrated no residual VSD or RSOVA shunt, resolution of right coronary cusp prolapse, and only mild residual aortic regurgitation. The patient was mobilized on postoperative day two and discharged on postoperative day three.

Conclusion: The coexistence of supracristal ventricular septal defect and ruptured sinus of Valsalva aneurysm is uncommon but represents an important congenital lesion associated with progressive aortic valve dysfunction. Multimodality imaging is essential for diagnosis and operative planning. Surgical repair offers excellent early outcomes and effectively eliminates residual shunting while preserving aortic valve function.

Keywords: Ruptured sinus of Valsalva aneurysm, supracristal ventricular septal defect, aortic regurgitation, congenital heart disease, cardiac surgery.

Multidisciplinary perioperative care for surgical stabilisation of multiple rib fractures in an

octogenarian with myasthenia gravis and asthma following blunt chest trauma: a case report

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Background: Multiple rib fractures increase morbidity in elderly patients, and surgical stabilisation of rib fractures (SSRF) achieves early mobilisation through pain control and pneumonia risk reduction. However, myasthenia gravis (MG) and asthma independently elevate risks of postoperative complications. Management of blunt chest trauma in elderly patients requiring SSRF, with concurrent MG and asthma, has rarely been reported and poses overlapping challenges perioperatively.

Case Illustration/Description: An 81-year-old man was admitted to the emergency department with right-sided blunt chest trauma following a fall, presenting with dyspnoea and chest pain exacerbated by deep inspiration and coughing. He had well-controlled MG and mild asthma but presented with acute asthma exacerbation, with increased reliever use unresponsive to usual controller therapy, raising concern for sputum retention. Preoperative assessment showed a Karnofsky score of 90–100; CT thorax revealed right-sided rib fractures (8–10) with haemopneumothorax and mild pulmonary contusion. Multidisciplinary preoperative care included 48-hour observation to monitor for ARDS development, pyridostigmine updose, nebulised bronchodilators, IV

methylprednisolone pre-induction, and extended family consent on perioperative risks. Intraoperatively, one lung ventilation was achieved via a double-lumen tube with protective lung ventilation and strict neuromuscular blocker and reversal choice and titration. Surgery comprised exploratory thoracotomy, pneumopneural fistula repair, multiple rib SSRF, intercostal nerve block, and chest tube insertion. Postoperatively, he was managed in the ICU with smooth extubation within 12 hours and adequate mentation on low-dose fentanyl analgesia. Ward care continued with medication, nutrition support, and post-thoracotomy rehabilitation. He was discharged on postoperative day 5 with minimal pain, no pneumonia, independent ambulation, and target incentive spirometry volumes achieved.

Conclusion: Favourable outcomes in this particular elderly patient with blunt chest trauma and multiple rib fractures undergoing SSRF were achieved through multidisciplinary, individualised perioperative care: judicious surgical timing, pyridostigmine and bronchodilator titration, choice of neuromuscular blockade agent and reversal, protective lung ventilation, and structured postoperative care.

Keywords: Rib fractures; Aged, 80 and over; Myasthenia gravis; Asthma; One-lung ventilation

Limb- and Life-Saving Reconstruction for Catastrophic Iliac Vessel Injury During Emergency Obstetric Surgery: A Case Report

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Background: Major iliac vessel injury during emergency obstetric surgery is an exceptionally rare but life-threatening complication that may result in exsanguinating hemorrhage and acute limb ischemia. Timely management and definitive vascular reconstruction are crucial to achieve hemorrhage control and preserve lower-extremity viability. Case Illustration/Description:

A 41-year-old woman (gravida 3, para 1, abortion 1) at 21–22 weeks of gestation was referred after emergency

hysterectomy with bilateral salpingo-oophorectomy for uterine rupture complicated by uncontrolled pelvic hemorrhage. Damage-control surgery at the referring hospital included ligation of the right iliac artery to control bleeding. On arrival, the patient remained critically ill with hemorrhagic shock requiring norepinephrine support after massive transfusion. Vascular examination demonstrated absent right femoral, popliteal, posterior tibial, and dorsalis pedis pulses. Duplex ultrasonography revealed monophasic flow in the right common femoral and popliteal arteries with absent distal flow, consistent with acute limb ischemia secondary to suspected right external iliac artery injury. Emergency vascular exploration revealed complete rupture of the right external iliac artery, complete rupture of the right internal iliac vein, multiple lacerations of the right common iliac vein, and extensive iliac venous thrombosis. Definitive reconstruction consisted of repair of the common iliac artery and vein, ligation of the injured internal iliac vein, right ilio-ilio bypass using an autologous reversed great saphenous vein graft, and iliac venous thrombectomy. Intraoperative duplex ultrasonography confirmed restoration of arterial flow to the common femoral, popliteal, and posterior tibial arteries. Hemostasis was achieved without active anastomotic bleeding, and the patient hemodynamically stable at the completion of surgery.

Conclusion:

Catastrophic iliac vessel injury during emergency obstetric surgery can be successfully managed through staged damage-control surgery followed by definitive vascular reconstruction. Combined arterial bypass, venous repair, and thrombectomy restored limb perfusion while achieving life-saving hemorrhage control, highlighting the importance of early vascular surgical involvement and multidisciplinary collaboration.

Keywords: Iliac vessel injury; emergency obstetric surgery; vascular reconstruction

From Metastatic Disease Control to Bridging Systemic Therapy: The Evolving Role of Thoracic Surgery in Recurrent Primary Mediastinal B- cell Lymphoma – 3 Years of longitudinal Follow-up.

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Background: Primary mediastinal B-cell lymphoma (PMBCL) is predominantly managed with systemic chemoimmunotherapy, while surgery is generally confined to diagnostic biopsy or management of selected complications. The role of thoracic surgery throughout disease progression remains poorly defined. We describe the longitudinal clinical course of an adolescent with recurrent PMBCL, illustrating how thoracic surgery assumed distinct therapeutic roles across multiple stages of treatment.

Case Illustration/Description: A 14-year-old boy presented in 2023 with a large anterior mediastinal mass initially suspected to represent thymoma or lymphoma. After referral to a tertiary cancer center, PMBCL was confirmed and treated with multimodal chemotherapy and radiotherapy, resulting in marked regression of the primary mediastinal lesion. During surveillance, an isolated pulmonary metastasis developed and was successfully managed with left lower lobectomy for local disease control. Several months later, the patient presented with gross hematuria and severe lower urinary tract symptoms. Renal biopsy demonstrated metastatic PMBCL with diffuse CD20 and CD30 expression. Restaging imaging additionally revealed a persistent left fifth intercostal mass adjacent to the mediastinum. Although radiologic progression appeared limited, multidisciplinary evaluation identified an increasing risk of cardiovascular compromise and recommended salvage surgery to optimize local control before further systemic therapy. Intraoperatively, the tumor extended beyond preoperative imaging, involving the fourth and fifth ribs and pericardium, requiring en-bloc chest wall resection with partial pericardiectomy. Definitive reconstruction was achieved using titanium mesh and a pedicled vertical rectus abdominis myocutaneous (VRAM) flap. The patient recovered uneventfully with excellent flap viability and proceeded to planned continuation of systemic treatment.

Conclusion: This case illustrates that the role of thoracic surgery in PMBCL may evolve throughout the disease course—from metastatic disease control to salvage resection preventing impending cardiovascular compromise and enabling continuation of systemic

therapy. Careful multidisciplinary patient selection may broaden the therapeutic contribution of thoracic surgery beyond diagnosis in recurrent PMBCL.

Keywords: Primary Mediastinal B-cell Lymphoma; Salvage Surgery; Chest Wall Reconstruction; Pulmonary Metastasectomy; Multidisciplinary Management

The Hemodialysis Vascular Access Dilemma in Eisenmenger Syndrome: Aneurysmal Arteriovenous Access and Central Venous Collaterals Prompting Tunneled Catheter Consideration in Late-Diagnosed Congenital Heart Disease

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Background: Congenital heart disease (CHD) is usually identified and corrected in early childhood; survival into adulthood with uncorrected disease and Eisenmenger syndrome is uncommon and carries progressive multisystem injury, including cyanotic nephropathy that may advance to end-stage renal disease (ESRD). When hemodialysis (HD) becomes necessary, vascular access selection is exceptionally difficult: a preload-dependent, pulmonary-hypertensive circulation, secondary erythrocytosis with a combined bleeding-and-thrombosis tendency, and right-to-left shunting create competing hazards for both arteriovenous (AV) access and central venous catheters, and the optimal strategy is undefined.

Case Illustration/Description: A woman in her late twenties, with previously unrecognized cyanotic CHD and a clinical diagnosis of Eisenmenger syndrome with severe pulmonary arterial hypertension, was referred while already maintained on HD through a right forearm AV shunt; her cardiac disease had never been investigated in childhood and supporting data were limited. Examination showed central cyanosis, a mixed pectus excavatum and carinatum chest-wall deformity, prominent chest-wall venous collaterals, abdominal distension consistent with ascites, and marked cachexia. The AV access had become aneurysmal with overlying skin ulceration and threatened

rupture, while the chest-wall collaterals raised concern for central venous stenosis. Conversion to a tunneled dialysis catheter was therefore considered; however, in Eisenmenger physiology a catheter carries risks of paradoxical embolism through the right-to-left shunt, catheter thrombosis from hyperviscosity, and infection, whereas a high-output AV access imposes an additional cardiac-output burden poorly tolerated by the failing, pulmonary-hypertensive circulation. Access planning thus demanded individualized, multidisciplinary deliberation balancing these risks.

Conclusion: HD vascular access selection in Eisenmenger syndrome is an unresolved surgical dilemma without an established optimal approach, as both AV access and tunneled catheters carry serious, physiology-specific hazards. Late-diagnosed CHD progressing to ESRD warrants early multidisciplinary access planning and dedicated study.

Keywords: Eisenmenger syndrome; vascular access; hemodialysis; pulmonary arterial hypertension; congenital heart disease

Successful Chest Wall Reconstruction using Eloesser Flap and NPWT in Chronic Empyema Case caused by *Mycobacterium tuberculosis* bacteria

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Background: Concurrent chronic empyema thoracis and bronchopleural fistula (BPF) following pulmonary surgery, particularly in patients with a history of incomplete tuberculosis (TB) therapy, present severe therapeutic challenges. Managing these cases requires a well-orchestrated, staged strategy focused on control

Case Illustration/Description: A 33-year-old male with severe progressive dyspnea, orthopnea, fever, and a purulent productive cough. He had a history of incomplete pulmonary TB treatment and previous bilateral thoracotomies. Examinations revealed a massive, loculated empyema and a recurrent left-sided BPF. Pleural fluid analysis confirmed frank empyema, with cultures isolating methicillin-susceptible *Staphylococcus aureus* (MSSA).

Initial closed tube thoracostomy (CTT) with a water-sealed drainage (WSD) system and targeted antibiotic therapy (Ceftriaxone and Metronidazole) stabilized the patient but failed to close the fistula. To establish definitive, gravity-dependent drainage, a modified Eloesser flap (open window thoracostomy) was performed one month later. Postoperatively, active Negative Pressure Wound Therapy (NPWT) was applied for one week, followed by one month of daily sterile dressings. This regimen achieved complete cavity sterilization and granulation. Definitive chest wall reconstruction and dead space obliteration were successfully executed using a pedicled latissimus dorsi (LD) myocutaneous flap, yielding excellent long-term functional outcomes.

Conclusion: Complex post-tuberculosis post-surgical empyema and BPF cannot be resolved by conservative drainage alone. A coordinated, multidisciplinary, staged approach combining open window thoracostomy, active negative pressure therapy, and vascularized tissue reconstruction presents a highly effective, reliable, and reproducible blueprint for managing extensive thoracic defects.

Keywords: chronic empyema thoracis, bronchopleural fistula, Eloesser Flap, NPWT

Conversion to Thoracotomy During Robot-Assisted Thoracic Surgery Versus Video-Assisted Thoracoscopic Surgery for Anatomical Lung Resection: A Systematic Review and Meta-Analysis of Incidence Rates and Associated Risk Factors

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Background/Introduction: Minimally invasive approaches, including robot-assisted thoracic surgery (RATS) and video-assisted thoracoscopic surgery (VATS), have increasingly been adopted for lung resection, but

conversion to thoracotomy remains necessary in selected intraoperative circumstances.

Objectives: This systematic review and meta-analysis aimed to compare the risk of conversion to thoracotomy between RATS and VATS during anatomical lung resection and to identify associated causes and risk factors.

Method: A systematic search of PubMed, Scopus, and ScienceDirect identified comparative studies evaluating RATS and VATS for anatomical lung resection in patients with lung neoplasms. The primary outcome was conversion to thoracotomy. Risk of bias was assessed using the Newcastle-Ottawa Scale (NOS). Pooled risk ratios (RRs) with 95% confidence intervals (CIs) were calculated using a random-effects model in RStudio.

Result: Ten cohort studies involving 38211 participants (10975 RATS vs 27236 VATS) were included, of which nine were included in the meta-analysis. RATS was associated with a significantly lower risk of conversion to thoracotomy than VATS (RR 0.32, 95% CI 0.12–0.83; $P = 0.03$), although heterogeneity was substantial ($I^2 = 85.9\%$). Vascular injury and bleeding were the most frequently reported causes of conversion. Other reported causes included pleural or hilar adhesions, calcified or technically challenging lymph nodes, difficult hilar dissection, challenging anatomical conditions, and technical difficulties. Factors associated with conversion included impaired pulmonary function, larger tumor size (>4.5 cm), obesity, hypertension, advanced tumor stage, and left-sided resection. However, these factors could not be quantitatively pooled because of heterogeneity in their definitions, assessment, and reporting across studies.

Conclusion: RATS is associated with a lower risk of conversion to thoracotomy than VATS during anatomical lung resection for lung neoplasms, although substantial heterogeneity warrants cautious interpretation.

Keywords: Lung Neoplasm, Lung Resection, Robot-Assisted Thoracic Surgery, Thoracotomy, Video-Assisted Thoracic Surgery

A Wolf in Sheep's Clothing: Relapsing Lung Abscess Façade as Lung Carcinoma in a High-Risk Individual

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Background: Lung abscesses' radiological appearance is un-pathognomonic and may rarely mimic primary lung carcinoma on computed tomography (CT), particularly in high-risk individuals.^{1,2,3} A history of pulmonary infection should be considered when differentiating residual lung abscesses from malignancy even in high risk individuals.^{3,4,5} We report a patient with multiple risk factors for lung cancer whose CT findings suggested primary lung nodules, but surgical biopsy confirmed a chronic lung abscess.

Case Illustration/Description: A 43-year-old Javanese man with a 30-year smoking history (>20 pack-years) was referred to National Respiratory Center after an incidental right lower lobe pulmonary nodule was detected on chest radiography and confirmed by CT. He presented with fatigue and occasional dyspnea. Despite normal vital signs, laboratory findings shows no leukocytosis, and a negative bronchoscopic biopsy, lung malignancy was strongly suspected because of his smoking history, family history of lung cancer, previous lung abscess, and persistent 7.7-cm semi-solid cystic lesion despite three months of levofloxacin and metronidazole therapy. Right lower lobectomy was performed for definitive diagnosis. Intraoperatively, the lesion contained pus, and histopathological examination demonstrated chronic inflammation, hemorrhage, fibrosis, and a probable bronchogenic cyst, consistent with a chronic lung abscess. The patient had an uneventful recovery, was discharged on postoperative day 8, and remained asymptomatic at two-week follow-up.

Conclusion: Lung abscesses may rarely mimic primary lung carcinoma on computed tomography (CT), posing a diagnostic challenge, particularly in high-risk patients supported by few case reports.^{1,2,3,4,5} In our cases, Malignancy was suspected due to Persistent pulmonary lesions despite antibiotic therapy. Definite diagnosis by right lower lobectomy was confirmed a lung abscess. This case highlights importance of surgical biopsy as gold standard and systematic algorithms to accelerate the definite treatment of multifaceted cases to ensure definite treatment.^{6,7,8}

Keywords: Lung abscess; Primary lung nodules; bronchogenic cyst; surgical biopsy



A Multidisciplinary Approach to Refractory Priapism: Cavernosal– Femoral Vein Shunt Using Autologous Vein Graft

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Background: Priapism is a rare urological emergency characterized by a persistent penile erection lasting more than four hours without sexual stimulation. Ischemic priapism, the most common subtype, results from impaired venous outflow, leading to tissue hypoxia, acidosis, corporal fibrosis, and irreversible erectile dysfunction if treatment is delayed. Current management follows a stepwise approach, beginning with corporal aspiration, irrigation, and intracavernosal sympathomimetic injection, with surgical shunting reserved for refractory cases.

Case Illustration/Description: We report a case of refractory ischemic priapism successfully managed using a cavernosal–femoral venous shunt with an autologous great saphenous vein graft. The patient presented with a sustained, relatively painless penile erection following intermittent nocturnal erections. Initial treatment with corporal aspiration, irrigation, and intracavernosal adrenaline failed to achieve detumescence. A multidisciplinary team comprising urology and vascular surgery specialists performed a cavernosal– venous shunt using a harvested left great saphenous vein graft. Postoperatively, anticoagulation with intravenous heparin followed by oral warfarin was administered. The patient was discharged on postoperative day five with satisfactory recovery. At one-week follow-up, he reported minimal pain, mild leg swelling at the graft harvest site, satisfactory wound healing, no urinary complications, and partial recovery of erectile function. This case highlights several important clinical considerations. Ischemic priapism may present atypically with minimal pain, potentially delaying diagnosis.

Although distal shunts such as the Winter procedure remain established surgical options, their effectiveness may be limited in prolonged cases and may be associated with recurrent priapism or persistent shunt flow causing erectile dysfunction. In contrast, a cavernosal–femoral venous shunt using an autologous saphenous vein graft provided effective decompression while offering the unique advantage of future catheter-based flow modulation through selective graft occlusion using coil embolization or an Amplatzer vascular plug if persistent shunt flow compromises erectile function.

Conclusion: This case emphasizes the importance of multidisciplinary collaboration and suggests that this technique may represent a valuable

Keywords: Priapismus; cavernosal–femoral venous shunt; autologous saphenous vein graft

Respect Rather Than Replace: Tailored Mitral Valve Repair in Barlow Mitral Valve Disease — A Three–Case Series

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Background: Barlow mitral valve disease (BMVD) represents the most complex form of degenerative mitral valve disease, characterized by excessive leaflet tissue, multisegment prolapse, chordal elongation or rupture, and annular dilatation. Given its heterogeneous anatomical presentation, successful repair often requires a lesion-specific reconstructive strategy rather than a uniform surgical approach. We present a three-case series illustrating tailored mitral valve repair techniques in patients with BMVD.

Case Illustration/Description: Three patients with severe mitral regurgitation secondary to BMVD underwent mitral valve repair at our institution. Intraoperative assessment revealed distinct pathological patterns, including anterior leaflet prolapse with chordal rupture, excessive posterior leaflet tissue, bileaflet prolapse, and elongated chordae. Repair strategies were individualized according to the

underlying anatomy and included anterior neochordal reconstruction, leaflet plication, modified McGoon repair, Snail technique shortening of excessive posterior leaflet tissue, chordal resection, leaflet peeling, and ring annuloplasty. Rather than relying on a single reconstructive method, each repair incorporated a combination of techniques tailored to the specific valvular abnormalities encountered. Intraoperative transesophageal echocardiography demonstrated competent valve function without residual mitral regurgitation, systolic anterior motion, or significant transmitral gradient in all cases.

Conclusion: Barlow mitral valve disease encompasses a broad spectrum of anatomical abnormalities that require individualized repair strategies. A tailored approach combining lesion-specific reconstructive techniques allows preservation of the native mitral valve while restoring valve competence. These cases highlight the importance of understanding pathological morphology and selecting repair techniques according to the unique anatomical characteristics of each patient.

Keywords: Barlow Mitral Valve Disease; Mitral Valve Repair; Neochordae Reconstruction; Snail Technique; Modified McGoon Repair

Bentall Procedure in a Patient with Active Pulmonary Tuberculosis: A Case Report on Perioperative Timing and Multidisciplinary Management

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Background: Ascending aortic aneurysm requiring Bentall procedure demands timely correction to prevent dissection or rupture. Indonesia carries the second-highest global TB burden. Concurrent active TB complicates surgical timing, as surgery increases reactivation risk. Preoperative antituberculosis therapy (OAT) duration before thoracic surgery varies from two weeks to twelve months, with no consensus.

Case Illustration/Description: A 58-year-old male with a 3-year history of ascending aortic aneurysm self-

discontinued medication after feeling asymptomatic, presenting with palpitations and fatigability after supraventricular tachycardia triggered by flu medication. Echocardiography showed sinus of Valsalva enlarging from 60 to 75 mm over three years, with severe aortic regurgitation. Contrast CT performed for aneurysm workup incidentally revealed active pulmonary TB. Pulmonology proposed bronchoscopy for endobronchial confirmation; however, multidisciplinary cardiac conference agreed to postpone bronchoscopy and proceed with empirical OAT for a minimum of two weeks before surgery, with dental and ENT clearance obtained in parallel. The patient underwent Bentall procedure with a Masters Series valved conduit No. 29 mm. Ventricular fibrillation occurred immediately after cross-clamp removal, successfully terminated with two defibrillations. Postoperative Atrial Fibrillation with rapid ventricular response converted to junctional rhythm with antiarrhythmic therapy, with recurrent AF controlled with additional pharmacological rate control. The patient was transferred from ICCU on day 3; drains removed on day 5 with subsequent step-down from HCU. Postoperative echocardiography showed fully normalized aortic dimensions, and the surgical wound healed without complication. The patient was discharged on postoperative day 8.

Conclusion: Balancing the risk of aneurysm progression against operating amid active infection, the multidisciplinary team deliberately deferred definitive TB diagnostics in favor of timely empirical OAT and surgery. This risk-balanced approach — achieved through clear multidisciplinary role allocation — yielded a favorable outcome and may serve as a reference for standardized protocols in similar dual-urgency cases, particularly relevant in a high TB-burden country such as Indonesia.

Keywords: Bentall procedure; Pulmonary tuberculosis; Perioperative management; Multidisciplinary; Aortic aneurysm

Delayed Rupture of the Internal Carotid Artery Following Internal Jugular Double-Lumen Catheter Placement for Hemodialysis: A Case Report

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Background: The internal jugular vein is commonly used for dual-lumen hemodialysis catheter placement; however, it carries a risk of serious complications. Real-time ultrasound (US) guidance has been introduced to improve procedural safety and reduce catheter-related complications. Despite this advancement, catheter insertion is still performed without ultrasound guidance in some settings.

Case Illustration/Description: A 61-year-old man presented with pulsatile bleeding from a double-lumen catheter (CDL) insertion site 30 minutes after hemodialysis. The CDL had been inserted 4 months earlier and had been used for five dialysis sessions. He reported intermittent oozing from the site for one month prior to presentation. Examination revealed weakness, tachycardia, hypotension, and active bright-red pulsatile bleeding. Emergency vascular exploration demonstrated an intact internal jugular vein and rupture of the right internal carotid artery, temporarily sealed by a clot. The artery was successfully repaired with 7-0 Prolene suture after clot evacuation. The patient recovered uneventfully and was discharged on postoperative day 3 without neurological deficits. Arterial puncture is a recognized complication during percutaneous internal jugular vein catheterization, with a reported incidence of 3.7–12%. Most cases are managed with compression; however, improper placement may injure adjacent vessels, including the carotid artery, subclavian vessels, or aorta. Differentiating arterial from venous cannulation based only on blood color and pulsatility can be challenging. Mechanical complications include pneumothorax, air embolism, malposition, and vascular injury. Arterial placement of a double-lumen catheter is particularly concerning in dialysis patients due to high-pressure blood flow. The use of ultrasound guidance may reduce vascular injury risk during catheter insertion and facilitate early recognition of malposition or related complications.

Conclusion: Delayed rupture of the internal carotid artery after hemodialysis catheter placement is a rare but potentially life-threatening complication. Persistent or recurrent bleeding from a catheter site should raise

suspicion of vascular injury, requiring prompt evaluation and management.

Keywords: Carotid artery rupture; hemodialysis; double-lumen catheter; vascular repair

Anaortic Off-Pump Coronary Artery Bypass with a Left Internal Mammary Artery-Based Composite Y-Graft and Sequential Transit-Time Flow Measurement in a Patient with Unexpected Severe Ascending Aortic Calcification: A Case Report

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Background: Severe, unexpected calcification of the ascending aorta discovered during coronary artery bypass grafting can necessitate real-time modification of the planned revascularization strategy, because manipulation of a diseased ascending aorta may increase the risk of cerebral embolization and perioperative stroke.

Case Illustration/Description: A 58-year-old man with symptomatic triple-vessel coronary artery disease and Class II obesity (body mass index 36.5 kg/m²) was scheduled for elective multivessel off-pump coronary artery bypass grafting with the left internal mammary artery (LIMA) and saphenous vein graft (SVG), including a conventional proximal vein-graft anastomosis to the ascending aorta. After sternotomy, unexpected circumferential severe calcification of the ascending aorta was identified on direct inspection and palpation. The strategy was immediately converted to an anaortic (“no-touch”) off-pump coronary artery bypass using a LIMA-based composite Y-graft as the sole inflow source, constructed in a stepwise fashion with sequential intraoperative transit-time flow measurement. After the second distal anastomosis, transit-time flow measurement parameters were acceptable and the graft was extended to a third target (posterior descending artery, PDA). Repeat transit-time flow measurement then showed unfavorable, negative flow confined to the PDA limb, while the LAD and OM limbs remained satisfactory on bulldog-clamp

reassessment. Because right internal mammary artery harvesting was technically difficult and bilateral mammary harvesting carried additional sternal wound risk in this obese patient, the existing composite configuration was preserved rather than revised.

Conclusion: Unexpected severe ascending aortic calcification may require immediate intraoperative conversion to a no-touch strategy. Sequential transit-time flow measurement, applied as a structured checkpoint during progressive composite graft construction rather than only after completion, can support – but should not replace – experienced surgical judgement when unexpected physiological findings arise.

Keywords: coronary artery bypass grafting; anaortic off-pump coronary artery bypass; ascending aortic calcification; no-touch technique; transit-time flow measurement;

Comparing EuroSCORE II and the STS Risk Score for Predicting Operative Mortality in Adult Cardiac Surgery Among Asian Patients: A Systematic Review and Meta-Analysis of External Validation Evidence

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Background/Introduction: EuroSCORE II (European System for Cardiac Operative Risk Evaluation II) and the STS (Society of Thoracic Surgeons) score are the most widely used tools for predicting operative mortality after adult cardiac surgery, but both were derived largely from European and North American cohorts. Asian cardiac surgical populations differ in age, valve disease etiology, and overall case-mix, raising uncertainty about their transportability to Asian settings that no regional synthesis has yet quantified.

Objectives:

Systematically review and quantitatively synthesize external validation studies of EuroSCORE II and the STS score in adult cardiac surgery cohorts across Asia, and compare discrimination and calibration performance where head-to-head data exist.

Method: PubMed and Google Scholar were searched for studies externally validating EuroSCORE II and/or STS in Asian adult cardiac surgery cohorts. Discrimination (AUC,

area under the receiver operating characteristic curve) and calibration data were extracted. Where 95% confidence intervals (CI) for AUC were reported, a random-effects meta-analysis on the logit scale was performed.

Result: Ten studies from eight Asian countries or territories were included. EuroSCORE II AUC values ranged from 0.70 to 0.854. Lower performance was reported in several Indonesian, Malaysian, and Indian coronary artery bypass grafting (CABG) cohorts, whereas higher values were found in Hong Kong and Taiwan. In India, the STS score slightly outperformed EuroSCORE II (AUC 0.72 versus 0.71). In East China, the STS score also performed better (0.844 versus 0.814), although both were less accurate than SinoSCORE (0.888). Calibration was less consistent than discrimination, with clinically important mortality underestimation in several Indonesian and Malaysian cohorts despite non-significant goodness-of-fit statistics.

Conclusion: EuroSCORE II shows variable discrimination and often unreliable calibration in Asian cohorts, particularly CABG-predominant and Indonesian populations. STS may offer a modest discrimination advantage, but population-specific models outperform both imported scores, supporting the case for local recalibration or Asia-specific risk-prediction tools.

Keywords: EuroSCORE II; STS score; Risk prediction models; Cardiac surgery; Asia

When a Congenital Heart Defect Bleeds: Massive Hemoptysis in an Adult with Unrepaired Tetralogy of Fallot

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Background: Massive hemoptysis is an uncommon but life-threatening complication of unrepaired Tetralogy of Fallot (ToF) in adulthood. Chronic cyanotic heart disease promotes angiogenesis and the development of systemic-to-pulmonary collateral circulation, predisposing patients to pulmonary hemorrhage. However, because hemoptysis in young adults is more commonly attributed to pulmonary tuberculosis, bronchiectasis, or malignancy, congenital

heart disease is often overlooked, potentially delaying appropriate management.

Case Illustration/Description: A 27-year-old man with unrepaired ToF presented with hemoptysis and progressive dyspnea. He had declined definitive surgical correction after his childhood diagnosis. Physical examination demonstrated digital clubbing and characteristic cardiac murmurs. Despite initial supportive treatment, he rapidly deteriorated with profound cyanosis, spontaneous knee-chest positioning, oxygen desaturation from 98% to 70%, and progressive loss of consciousness, requiring endotracheal intubation. Repeated endotracheal suctioning continuously yielded fresh blood, consistent with ongoing pulmonary hemorrhage. Based on the clinical presentation, bleeding from systemic-to-pulmonary collateral vessels was considered the most likely mechanism, although pulmonary tuberculosis and malignancy remained important differential diagnoses.

Conclusion: This case illustrates that massive hemoptysis may represent a rare but catastrophic manifestation of unrepaired Tetralogy of Fallot in adulthood, with bleeding from hypertrophied systemic-to-pulmonary collateral vessels representing an important suspected mechanism. In patients with cyanotic congenital heart disease, rapid progression from hemoptysis to severe hypoxemia and respiratory failure should raise clinical suspicion for collateral vessel hemorrhage after more common etiologies have been excluded. Although the bleeding source could not be definitively confirmed in this case, the clinical course underscores the importance of early airway protection, multidisciplinary management, and timely vascular imaging to identify potential systemic-to-pulmonary collateral abnormalities and guide definitive intervention. This report emphasizes that congenital heart disease should remain an important differential diagnosis of massive hemoptysis in young adults, particularly in tuberculosis-endemic settings where more common causes may initially dominate the diagnostic evaluation.

Keywords: Tetralogy of Fallot; Massive hemoptysis; Acute respiratory failure, Congenital heart disease in adult

Does Diabetes Explain the Female Survival Disadvantage After Coronary Artery Bypass Grafting? A Systematic Review and Meta-

Analysis of Sex-Specific Mortality Across Diabetic and Nondiabetic Populations

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Background/Introduction: More than three decades after the first reports of a female survival disadvantage following coronary artery bypass grafting (CABG), the disparity remains unresolved. What has been missing is not confirmation that the gap exists, but clarity on what drives it. Diabetes mellitus is a compelling candidate. It is up to 50% more prevalent among women referred for CABG, yet it has never been formally tested as an effect modifier.

Objectives: We aimed to quantify sex-based mortality and adverse outcomes differences after isolated CABG and to test whether diabetic status accounts for them.

Method: PubMed, Scopus, ScienceDirect, and Cochrane Library were searched from inception to July 10, 2026, for cohort studies and registries reporting sex-stratified outcomes after isolated CABG. Operative (30-day/in-hospital) mortality, long-term (≥1 year) mortality, and major adverse cardiovascular events (MACE) were pooled using random-effects models.

Perventricular Device Closure Versus Conventional Surgical Repair for Doubly Committed Subarterial Ventricular Septal Defect in Pediatric Patients: A Systematic Review and Meta-Analysis of Postoperative Outcomes

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Background/Introduction: Doubly committed subarterial ventricular septal defect (dcsVSD) presents unique anatomical challenges. Although comprising only ~5% of ventricular septal defects, it is notably prevalent in Asian populations. Historically, conventional surgical repair has been the gold standard; however, reliance on cardiopulmonary bypass (CPB) and sternotomy often prolongs recovery. Perventricular device closure has emerged as a promising, minimally invasive alternative. Existing comparative studies frequently present conflicting



recovery outcomes due to small sample sizes or heterogeneous baseline characteristics.

Objectives: To evaluate the true impact of the perventricular approach versus conventional surgical repair on postoperative recovery outcomes in pediatric patients with dcsVSD.

Method: A systematic review and meta-analysis adhering to PRISMA guidelines was conducted by searching PubMed, ScienceDirect, and the Cochrane Library for comparative studies evaluating perventricular closure versus conventional repair for isolated dcsVSD. Methodological quality was appraised using the Risk of Bias in Non-randomized Studies of Interventions tool. Data analysis utilized a random-effects model to calculate the mean difference (MD) for continuous recovery outcomes, specifically intensive care unit (ICU) and total hospital length of stay.

Result: Four comparative studies meeting strict inclusion criteria with a low risk of bias were analyzed. Patients undergoing perventricular closure experienced a significantly shorter ICU stay compared to the conventional surgical group (MD -21.12 hours; 95% confidence interval [CI]: -39.12 to -3.12; $p=0.02$). Furthermore, total hospital stay was substantially reduced, with perventricular patients discharged nearly three days earlier (MD -2.80 days; 95% CI: -4.52 to -1.07; $p=0.001$). High statistical heterogeneity across outcomes was anticipated due to distinct clinical protocols across centers.

Conclusion: For pediatric patients with dcsVSD, perventricular device closure offers a better postoperative recovery profile compared to conventional surgical repair. By avoiding CPB and sternotomy, this minimally invasive approach significantly reduces ICU and overall hospital stays, accelerating patient rehabilitation and optimizing resource utilization in specialized cardiac centers.

Keywords: Doubly Committed Subarterial Ventricular Septal Defect; Perventricular Device Closure; Surgical Repair; Postoperative Outcomes; Meta-analysis

Clinical Outcomes of Konar-MF versus Amplatzer Occluders for Transcatheter Closure of VSD: A Systematic Review and Meta-Analysis

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Background/Introduction: Transcatheter closure is an established alternative to surgery for selected patients with perimembranous ventricular septal defects. The Konar Multifunctional Occluder and the Amplatzer Duct Occluder II are widely used low-profile devices; however, comparative evidence regarding their efficacy and safety remains limited.

Objectives: To compare the efficacy and safety of the Konar Multifunctional Occluder and the Amplatzer Duct Occluder II for transcatheter closure of perimembranous ventricular septal defects through a systematic review and meta-analysis.

Method: A systematic search of PubMed, Scopus, Embase, and Web of Science was performed from inception to July 2026. Comparative studies evaluating both devices were included following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. The primary outcome was procedural success. Secondary outcomes included complete atrioventricular block, residual shunt, device embolization, new aortic regurgitation, procedure time, and fluoroscopy time. Risk of bias was assessed using the Newcastle-Ottawa Scale. Random-effects meta-analysis was performed, and pooled odds ratios with 95% confidence intervals were calculated.

Result: Three comparative studies involving 184 patients (84 Konar Multifunctional Occluder and 100 Amplatzer Duct Occluder II) were included. No significant differences were observed in procedural success (OR 0.63, 95% CI 0.10–4.04; $I^2=13\%$), complete atrioventricular block (OR 0.69, 95% CI 0.09–5.55; $I^2=0\%$), device embolization (OR 1.01, 95% CI 0.13–7.90; $I^2=20\%$), or residual shunt (OR 1.51, 95% CI 0.51–4.46; $I^2=0\%$).

Conclusion: The Konar Multifunctional Occluder demonstrated clinical outcomes comparable to the Amplatzer Duct Occluder II for transcatheter closure of perimembranous ventricular septal defects. Both devices appear safe and effective, although larger prospective comparative studies are needed to strengthen the current evidence.

Keywords: Perimembranous ventricular septal defect; Transcatheter closure; Konar Multifunctional Occluder; Amplatzer Duct Occluder II; Systematic review and meta-analysis



Comprehensive Endovascular Management of Extensive Iliofemoral Deep Vein Thrombosis with Pharmacomechanical Thrombectomy and Iliac Vein Stenting: A Case Report

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Background: Extensive iliofemoral deep vein thrombosis (DVT) is associated with significant morbidity and an increased risk of post-thrombotic syndrome. While anticoagulation remains the standard treatment, selected patients with extensive thrombus burden may benefit from endovascular intervention to rapidly restore venous patency and relieve venous outflow obstruction.

Case Illustration/Description: A 63-year-old man with a history of left-sided ischemic stroke and residual mobility impairment presented with acute left lower extremity swelling secondary to extensive iliofemoral DVT. Because ultrasound-guided popliteal venous access was technically challenging, open exposure of the left popliteal vein was performed to facilitate venous cannulation. Venography demonstrated extensive iliofemoral thrombosis with proximal venous outflow obstruction, prompting establishment of an additional venous access through the saphenofemoral junction to optimize treatment of the proximal lesion. Intravascular ultrasound was subsequently performed to characterize the proximal iliac venous lesion and guide endovascular treatment. Balloon venoplasty was initially performed, followed by catheter-directed alteplase administration and pharmacomechanical thrombectomy using the AngioJet Zelante DVT system. Completion venography demonstrated persistent flow-limiting iliac venous narrowing, which was treated with implantation of a 12 × 90 mm self-expanding venous stent. Therapeutic anticoagulation with unfractionated heparin was transitioned to warfarin. The patient was discharged on postoperative day 3 with stable hemodynamics, reduced limb swelling, and no major bleeding complications.

Conclusion: This case highlights that successful treatment of extensive iliofemoral DVT may require flexible

endovascular strategies, including open venous exposure for difficult access, intravascular ultrasound-guided lesion assessment, pharmacomechanical thrombectomy, and iliac vein stenting. Careful procedural planning and adaptation to intraoperative findings can facilitate favorable early clinical outcomes.

Keywords: Deep vein thrombosis; Iliofemoral deep vein thrombosis; Pharmacomechanical thrombectomy; Intravascular ultrasound; Iliac vein stenting

Factors Associated with Mortality among Patients with Descending Necrotizing Mediastinitis (DNM) at Dr. Cipto Mangunkusumo Hospital

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Background/Introduction: Descending necrotizing mediastinitis (DNM) is a severe mediastinal infection resulting from the spread of infection from the cervical region through the deep cervical fascial spaces. This disease is characterized by rapid progression, high mortality, and frequent systemic complications such as sepsis and multiorgan failure.

Objectives: Various clinical factors are suspected to be associated with mortality in patients with DNM; however, data from Indonesia remain limited, highlighting the need for further investigation in this population.

Method: This study employed a retrospective cohort design involving patients with DNM treated at Dr. Cipto Mangunkusumo National General Hospital. Univariate, bivariate, and multivariate analyses were performed to evaluate the association between age, sex, type II diabetes mellitus (T2DM), extent of mediastinitis, symptom onset to diagnosis interval, C-reactive protein (CRP) levels, and sepsis with mortality. A total of 72 subjects with DNM were included.



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