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Double arterial cannulation versus single axillary arterial cannulation in acute type A aortic dissections: A study level meta-analysis.

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Disclosures: No COI

Background

- Increasing evidence has shown a superior outcome of axillary cannulation over femoral cannulation for repair of acute type A aortic dissection (ATAAD).
- Nevertheless, femoral artery cannulation retains its importance in ATAAD repair, especially in resuscitation and lower limb malperfusion scenarios.
- Double arterial cannulation (DAC) - which includes both axillary and femoral cannulation - has been applied in various contexts to take advantage of each approach.
- However, conflicting results have been reported regarding the efficacy of DAC versus single axillary cannulation (SAC) in ATAAD.



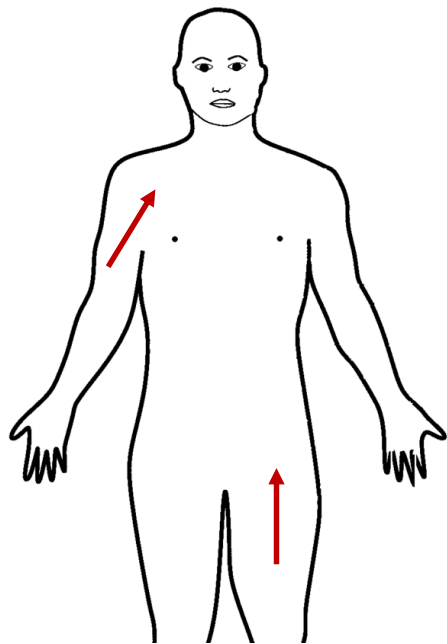
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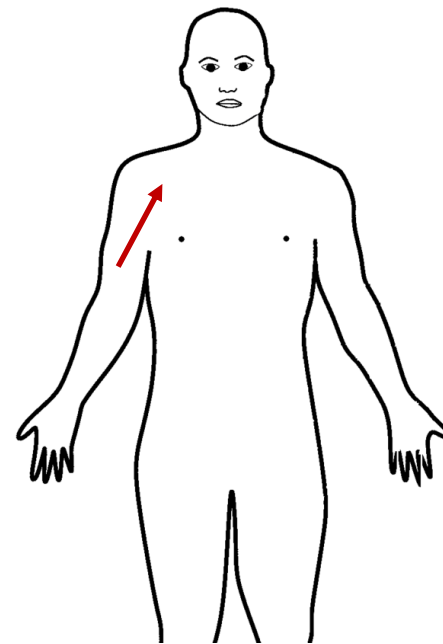
Objective

- In an effort to shed light on this ambiguity, we conducted a meta-analysis to compare early outcomes in ATAAD patients treated with either DAC or SAC.



Double arterial cannulation
(DAC)

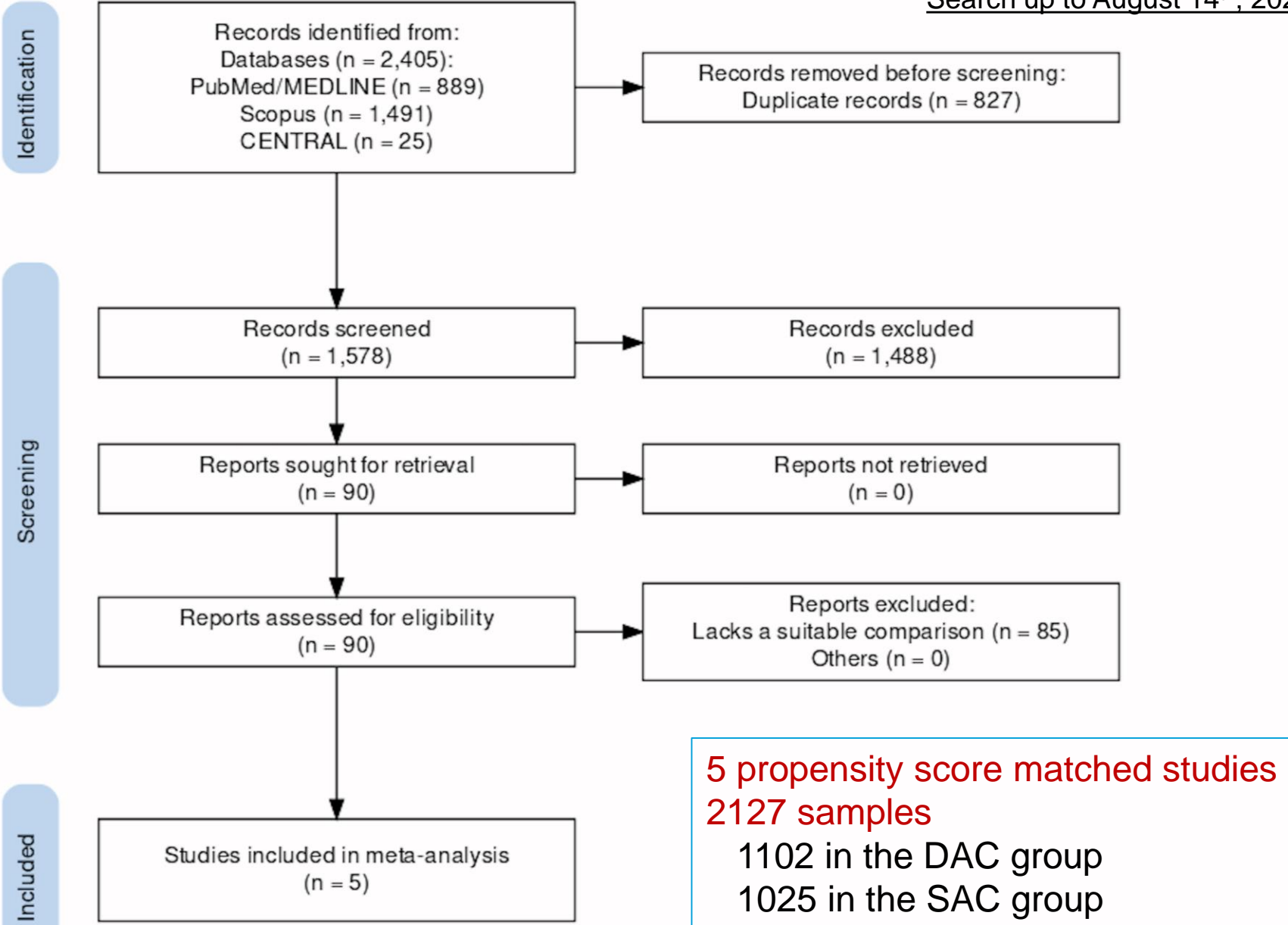
VS.



Single arterial cannulation
(SAC)



Search up to August 14th, 2023



5 studies included in this meta-analysis

References	Study period	Location	Study design	Unmatched			Matched		
				Overall, N	DAC, N	SAC, N	Overall, N	DAC, N	SAC, N
Kusadokoro et al. 2020	1990-2018	Japan	Retrospective /PSM	410	154	256	208	104	104
Zhang et al. 2021	2016-2018	China	Retrospective /PSM	431	341	90	231	154	77
Chang et al. 2022	2010-2019	China	Retrospective /PSM	929	523	406	776	388	388
Li et al. 2022	2017-2021	China	Retrospective /PSM	429	146	283	274	137	137
Wang et al. 2022	20039-2019	China	Retrospective /PSM	1408	333	1075	638	319	319

PSM: propensity score matched



Preoperative characteristics

References	Age, y		Male (%)		Shock (%)		Cerebral malperfusion (%)		Visceral malperfusion (%)		Renal malperfusion (%)		Lower limb malperfusion (%)	
	DAC	SAC	DAC	SAC	DAC	SAC	DAC	SAC	DAC	SAC	DAC	SAC	DAC	SAC
Kusadokoro et al. 2020	63 (54-71)	62 (54-69)	40	36	18	25	14	12	7	6	15	8*	26	24
Zhang et al. 2021	54±12	55±12	82	82	1.9	1.3	5.2	10	8.4	12	NR	NR	9.7	12
Chang et al. 2022	46±10	46±10	81	82	3.4	4.2	2.1	2.9	23	23	8.2	7.0	12	13
Li et al. 2022	51±10	50±10	85	85	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Wang et al. 2022	48 (39-55)	47 (41-54)	79	78	1.9	0.9	NR	NR	NR	NR	NR	NR	20	20

NR: not reported

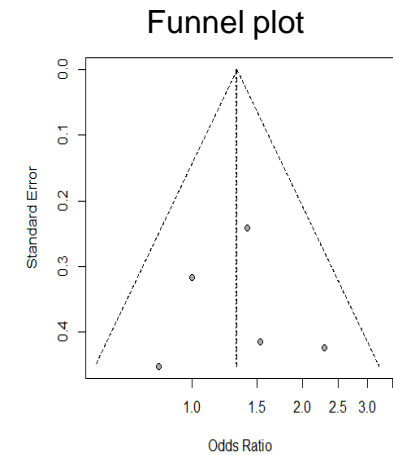
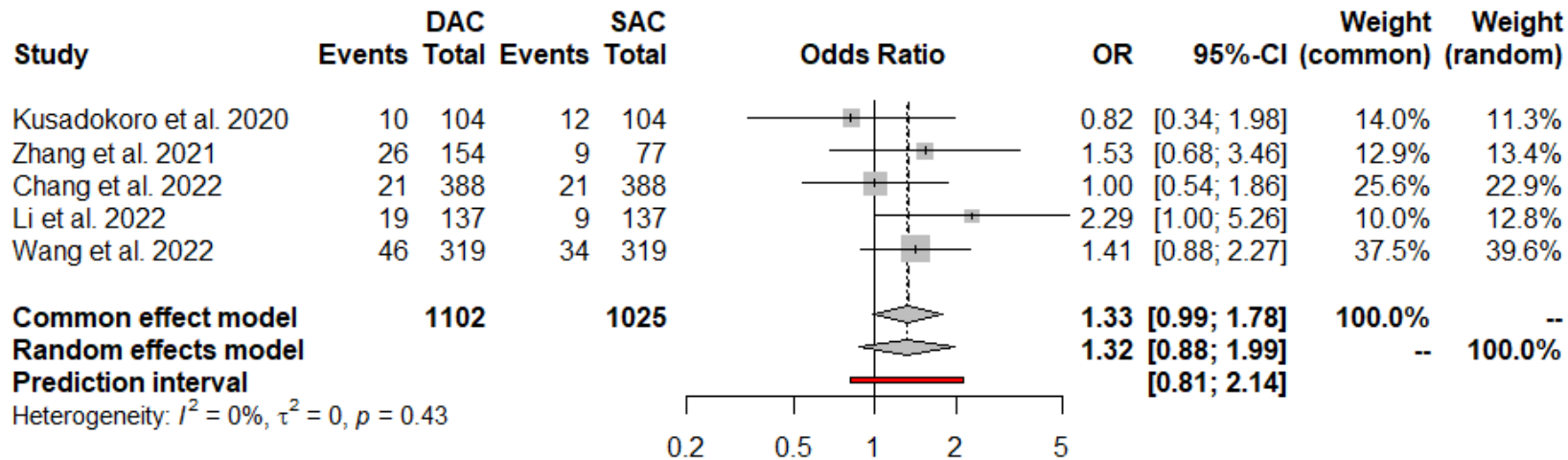


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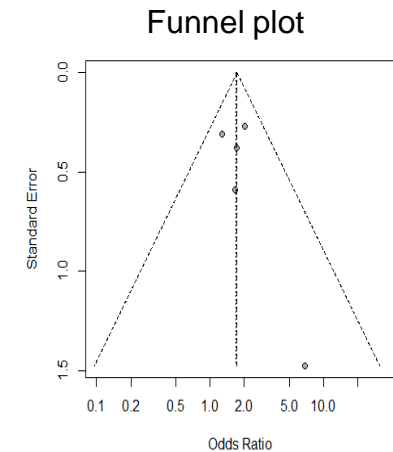
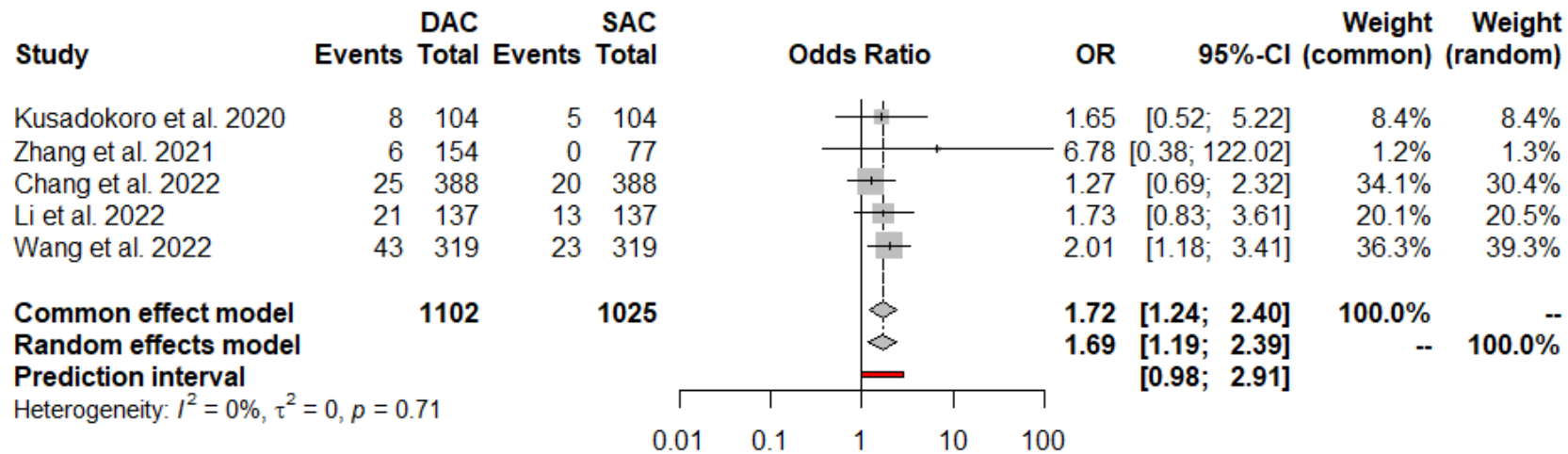
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Early mortality



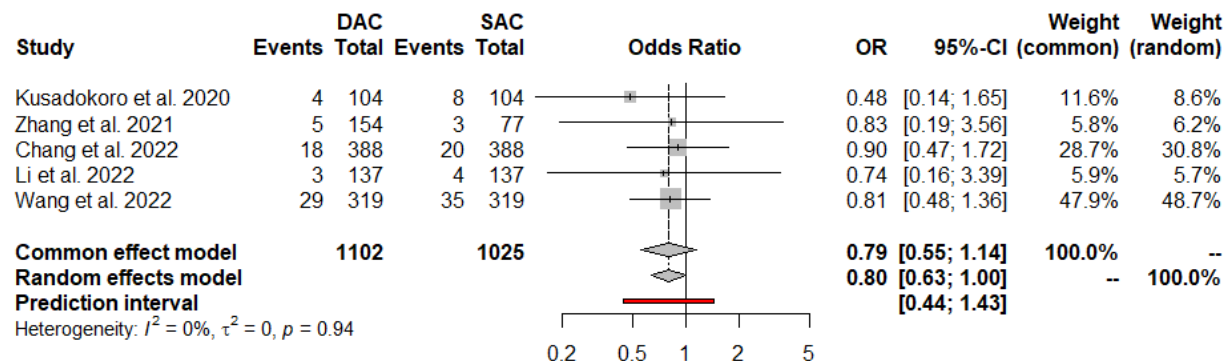
No significant difference between the groups

Stroke

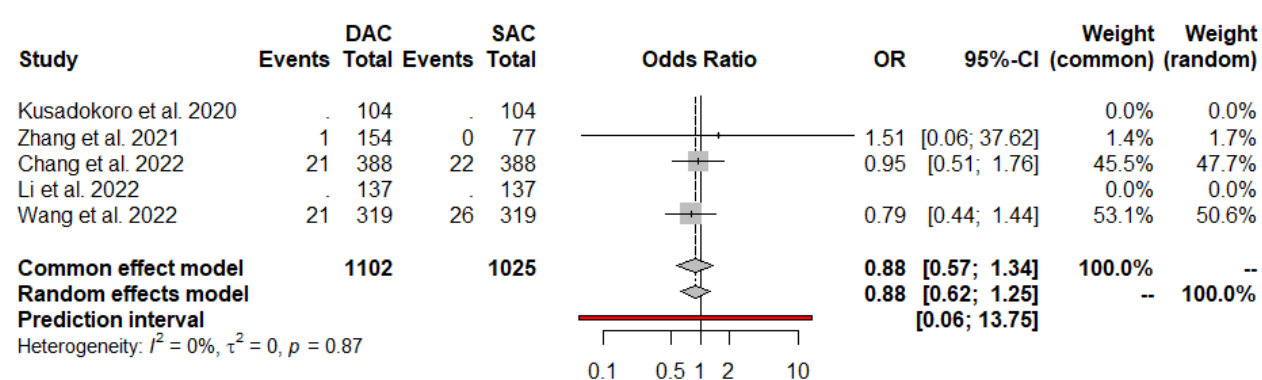


DAC was associated with a higher rate of postoperative stroke

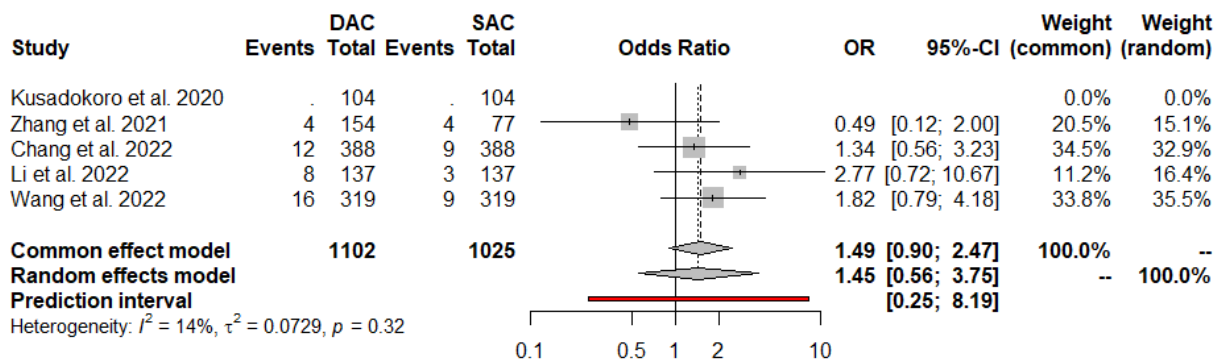
Bleeding requiring re-exploration



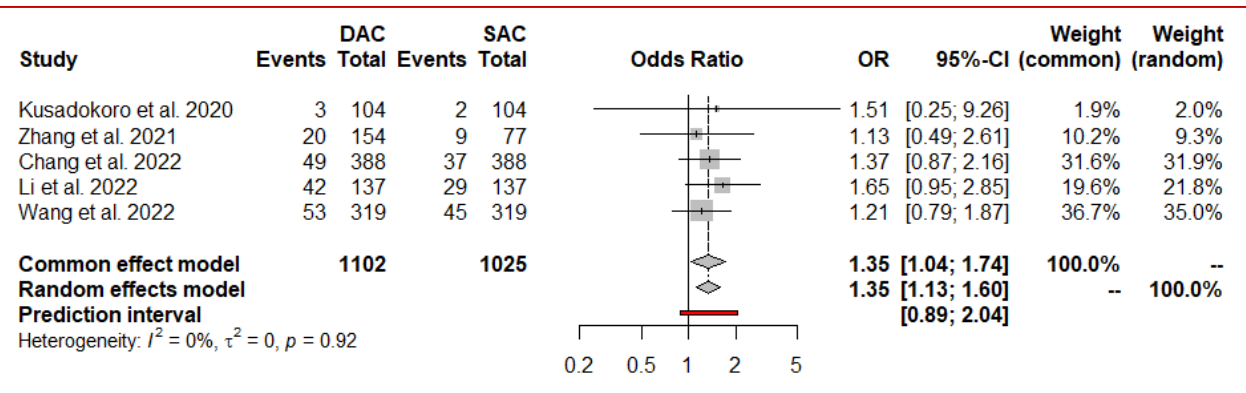
Spinal cord injury



Tracheostomy



Renal replacement therapy



DAC was associated with a higher rate of need for postoperative renal replacement therapy

No significant differences in CPB time, myocardial ischemic time, hypothermic circulatory arrest time, and ICU length of stay



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Discussion

- Retrograde flow, potentially leading to retrograde embolization and false lumen perfusion, may contribute to worse outcomes even with the DAC approach, which is known to occur with the femoral cannulation.
- Although the choice of cannulation site for ATAAD repair is currently largely dependent not only on patient status, but also on surgeon preference, we need to keep in mind that unnecessary DAC during ATAAD repair may lead to worse outcomes.
- Although propensity score methods are used in all the included studies to reduce confounding factors bias, selection bias remains.



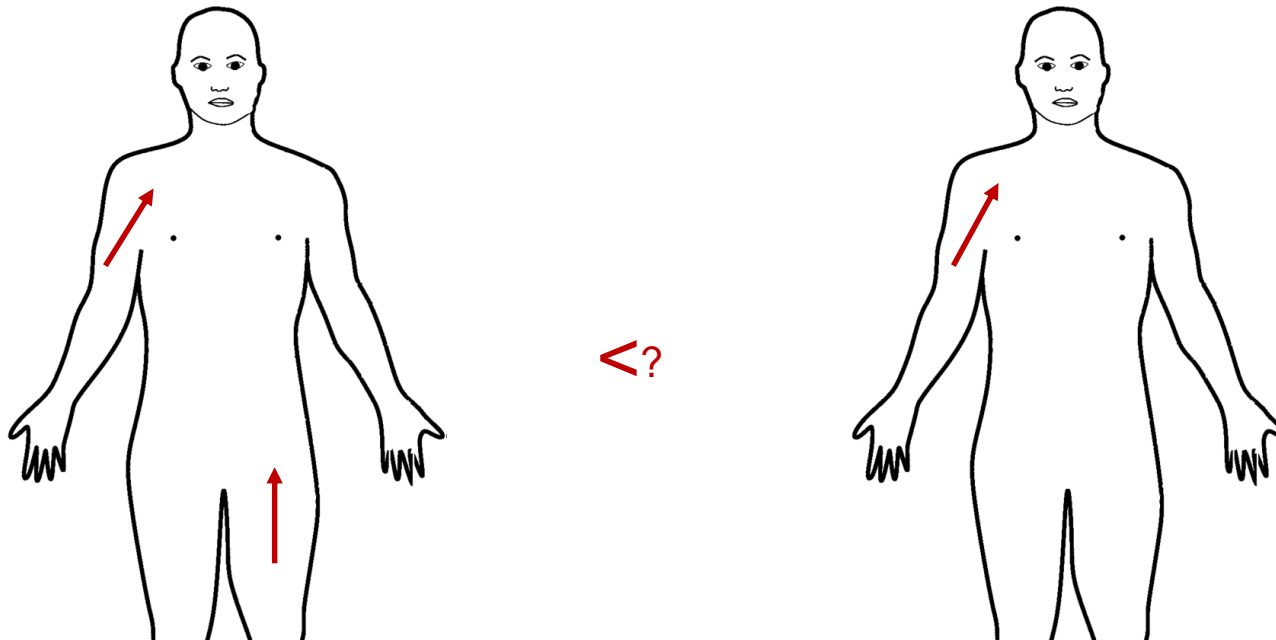
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Conclusion

- DAC was associated with a higher incidence of postoperative stroke as well as a higher rate of need for renal replacement therapy.
- Avoiding unnecessary femoral cannulation may be a key factor to improve clinical outcomes of ATAAD repair.



References

- 5 studies in this meta-analysis

Kusadokoro et al. *Eur J Cardiothorac Surg.* 2020

Zhang et al. *J Cardiothorac Surg.* 2021

Chang et al. *Front Cardiovasc Med.* 2022

Li et al. *Perfusion.* 2022

Wang et al. *J Thorac Cardiovasc Surg.* 2022



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