SUPPLEMENTARY MATERIAL

Supplementary Table S1A. Search query applied to MEDLINE and PubMed Central.

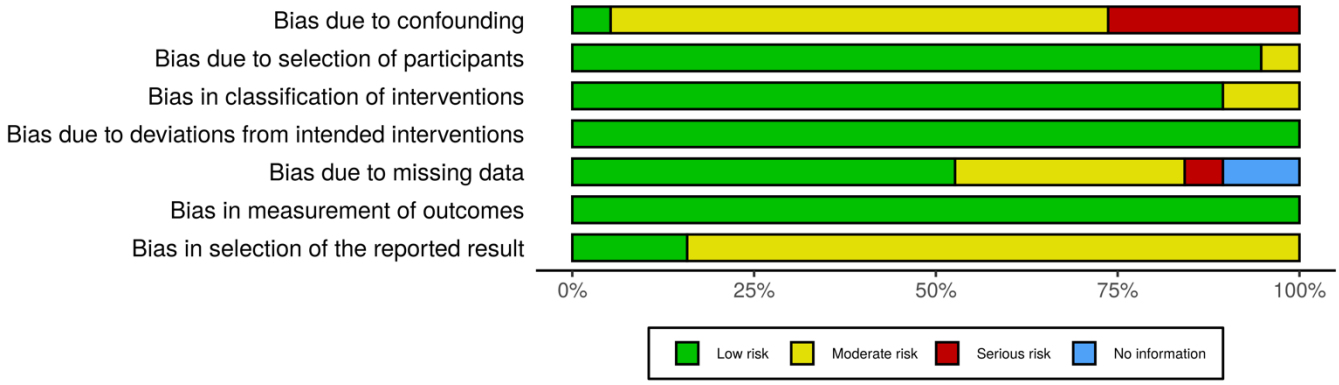
Overview		
Database	MEDLINE & PubMed Central	
Platform	PubMed	
Date of search	February 26th, 2021	
Number of results	4,561	
Syntax guide		
Mesh	Medical subject headings	
tiab	Words in title or abstract	
*	Truncation	
Search	**Query**	**Items found**
#1	Dissecting aneurysm [MeSh]	20,927
#2	Dissect* aneurysm*[tiab] OR aortic dissect*[tiab] OR blood vessel dissect*[tiab] OR Type a dissect*[tiab] OR DeBakey type 1[tiab] OR DeBakey type l[tiab]	24,830
#3	#1 OR #2	31,535
#4	Arch repair*[tiab] OR arch replacement*[tiab] OR arch reconstruction*[tiab] OR hemiarch repair*[tiab] OR hemiarch replacement [tiab] OR arch operation*[tiab] OR hemiarch operation*[tiab] OR ascending replacement*[tiab] OR ascending repair*[tiab] OR ascending aort* repair*[tiab] OR ascending aort* replacement*[tiab] OR proximal repair*[tiab] OR proximal replacement*[tiab] OR distal repair*[tiab] OR distal replacement*[tiab] OR exten* repair*[tiab] OR exten* replacement*[tiab]	62,478
#5	#3 AND #4	4,561

Supplementary Table S1B. Search query applied to Embase.

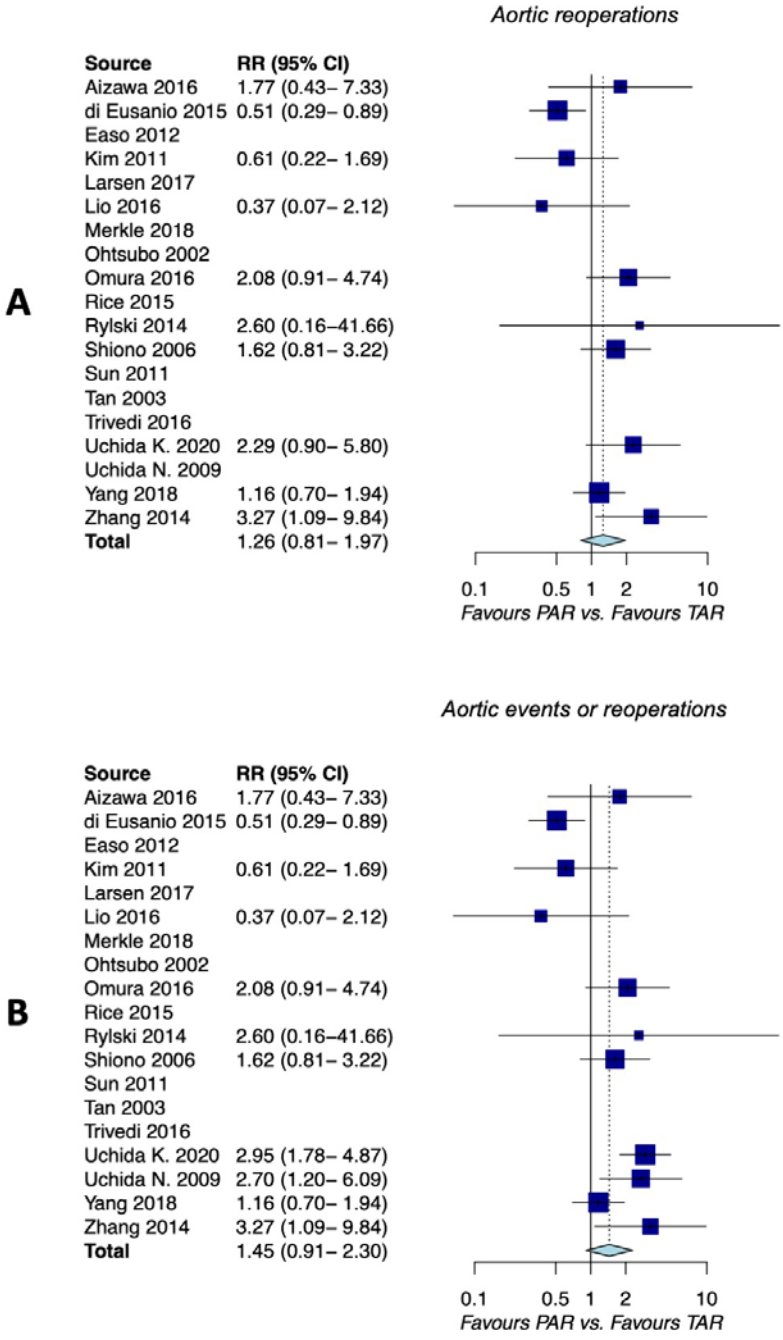
Overview		
Database	Embase	
Platform	Embase	
Date of search	February 26th, 2021	
Number of results	2,654	
Syntax guide		
/exp	EMtree keyword with explosion	
:ab,ti	Words in title or abstract	
*	Truncation	
Search	**Query**	**Items found**
#1	'Dissecting aneurysm'/exp	9,026
#2	'Aortic dissection'/exp	21,183
#3	'Dissect* aneurysm*':ab,ti OR 'aortic dissect*':ab,ti OR 'blood vessel dissect*':ab,ti OR 'Type a dissect*':ab,ti OR 'DeBakey type 1':ab,ti OR 'DeBakey type l':ab,ti	23,432
#4	#1 OR #2 OR #3	32,630
#5	'Aortic arch repair'/exp	2,800
#6	'Arch repair*':ab,ti OR 'arch replacement*':ab,ti OR 'arch reconstruction*':ab,ti OR 'hemiarch repair*':ab,ti OR 'hemiarch replacement ':ab,ti OR 'arch operation*':ab,ti OR 'hemiarch operation*':ab,ti OR 'ascending replacement*':ab,ti OR 'ascending repair*':ab,ti OR 'ascending aort* repair*':ab,ti OR 'ascending aort* replacement*':ab,ti OR 'proximal repair*':ab,ti OR 'proximal replacement*':ab,ti OR 'distal repair*':ab,ti OR 'distal replacement*':ab,ti OR 'exten* repair*':ab,ti OR 'exten* replacement*':ab,ti	5,446
#7	#5 OR #6	6,611
#8	#4 AND #7	2,654

Supplementary Figure S2. Risk of bias assessment per study.

Supplementary Figure S3. Risk of bias assessment per domain.



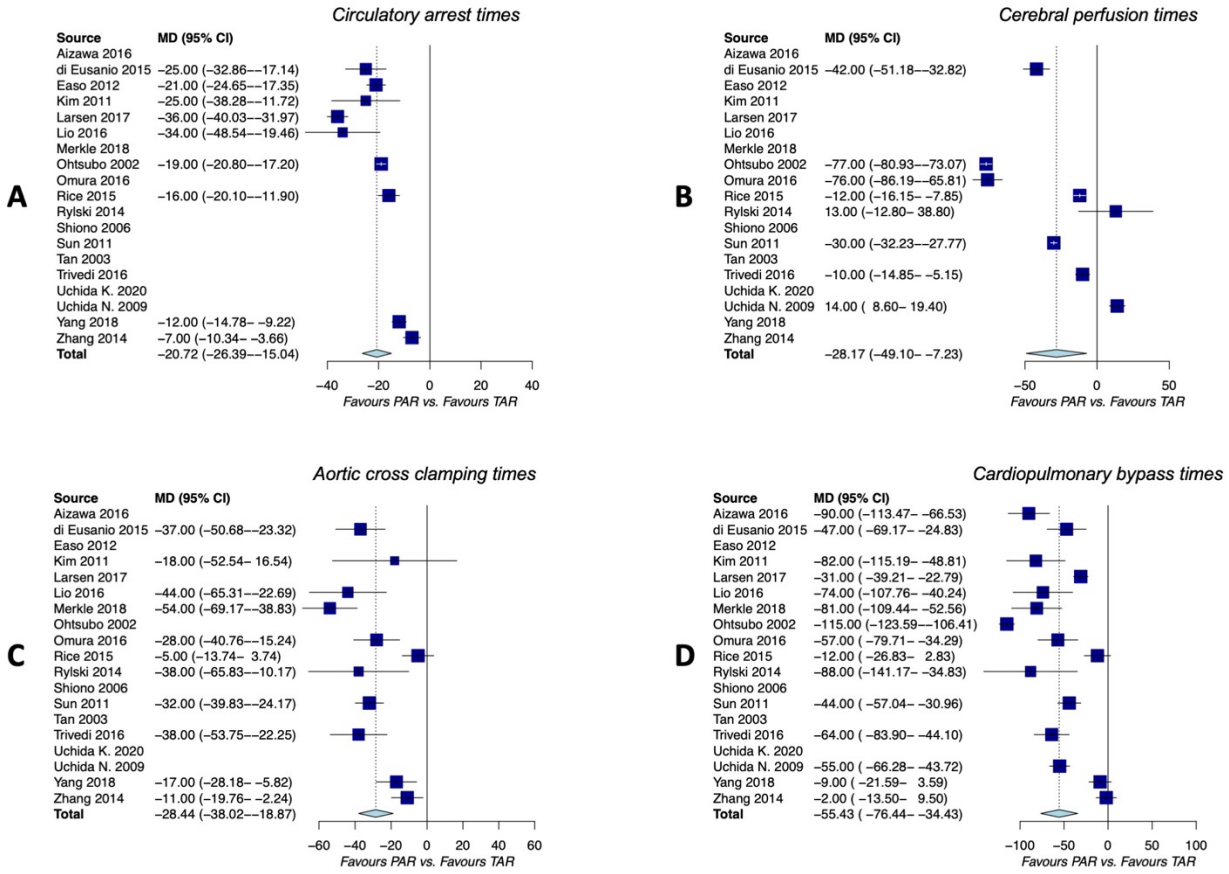
Supplementary Figure S4. Forest plots for aortic re-operations and aortic events or re-operations.



A: aortic re-operations, I^2=57%, p=0.013, B: aortic events or reoperations, I^2=70%, p<0.001.

CI: confidence intervals, PAR: proximal aortic repair, RR: relative risk, TAR: total arch replacement.

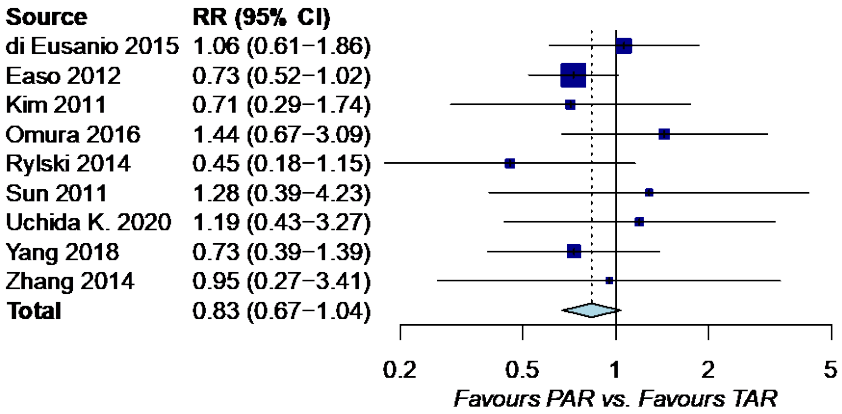
Supplementary Figure S5. Forest plots for surgical times.



A: circulatory arrest times, I^2=95%, p<0.001, B: cerebral perfusion times, I^2=95%, p<0.001, C: aortic cross clamping times, I^2=83%, p<0.001, D: cardiopulmonary bypass times, I^2=97%, p<0.001. All surgical times are presented in minutes.

CI: confidence intervals, MD: mean difference, PAR: proximal aortic repair, TAR: total arch replacement.

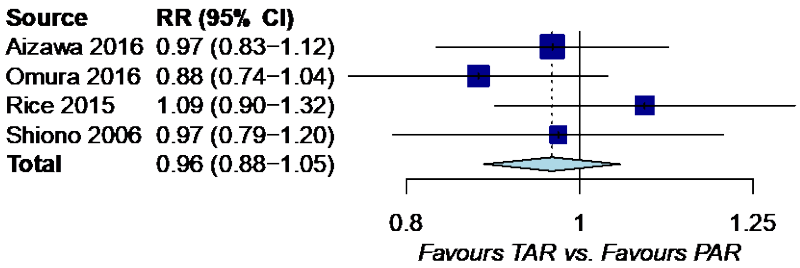
Supplementary Figure S6. Subgroup analysis for early mortality of studies describing exclusively patients with DeBakey type I dissection.



I^2=0%, p=0.62.

CI: confidence intervals, PAR: proximal aortic repair, RR: relative risk, TAR: total arch replacement.

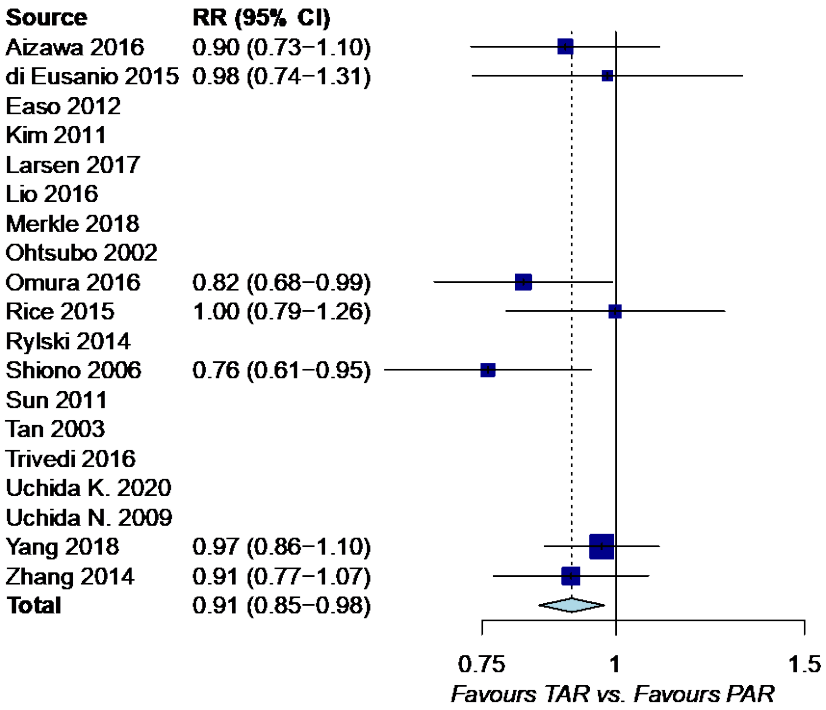
Supplementary Figure S7. Subgroup analysis of studies reporting 10-year survival rates on 5-year actuarial survival.



I^2=8%, p=0.35.

CI: confidence intervals, PAR: proximal aortic repair, RR: relative risk, TAR: total arch replacement.

Supplementary Figure S8. Forest plots of studies reporting actuarial survival rates beyond 5 years.



I^2=0%, p=0.46.

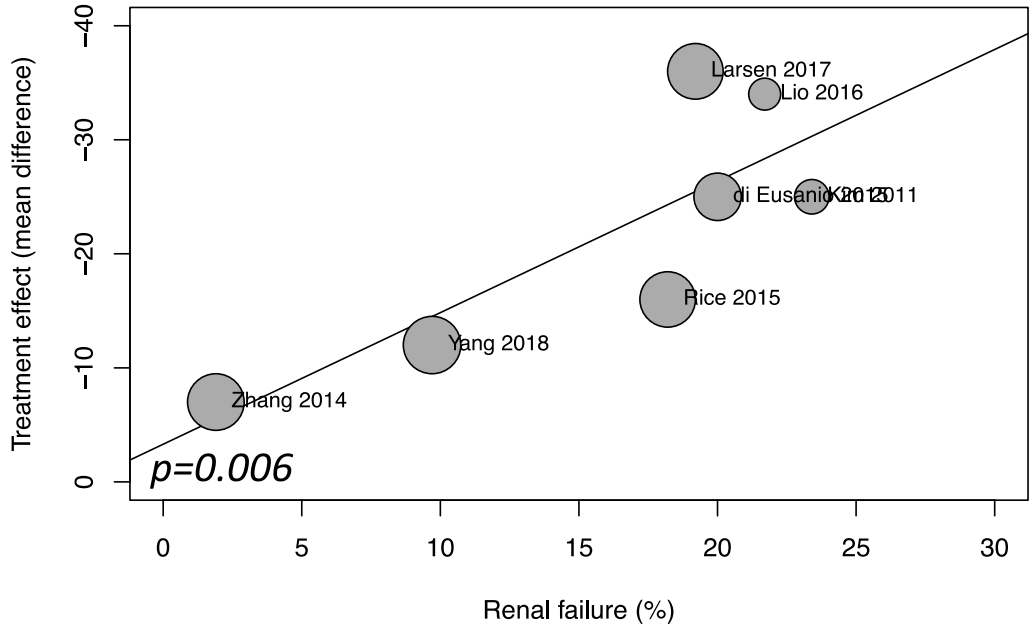
CI: confidence intervals, PAR: proximal aortic repair, RR: relative risk, TAR: total arch replacement.

Supplementary Table S9. Sensitivity analysis for strategy (tear-oriented versus non-tear-oriented), demonstrating consistent results independent of strategy.

	Number of studies	Number of patients	RR	95% CI	p-value	Consistent results?
Early mortality	17	4263				
Tear-oriented			0.60	0.41-0.89	0.012	Yes
Non-tear-oriented			0.73	0.59-0.91	0.004	
1-year survival	6	1437				
Tear-oriented			1.82	1.06-3.12	0.029	Yes
Non-tear-oriented			1.58	1.01-2.46	0.045	
5-year survival	11	2130				
Tear-oriented			1.63	0.74-3.58	0.224	Yes
Non-tear-oriented			0.84	0.39-1.78	0.642	
10-year survival	5	1559				
Tear-oriented			0.60	0.33-1.08	0.089	Yes
Non-tear-oriented			0.81	0.67-1.14	0.222	

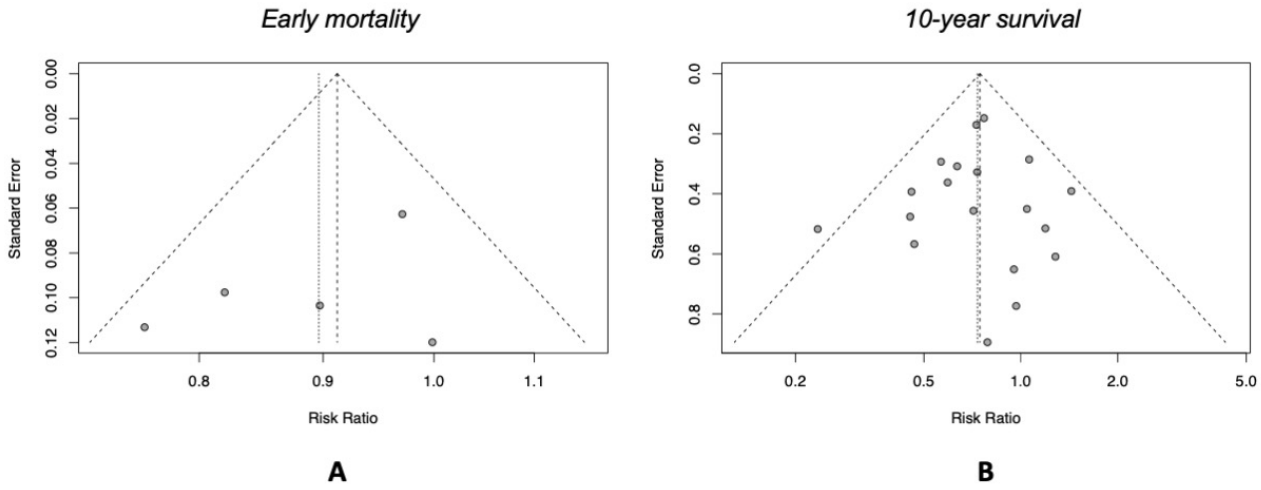
CI: confidence interval, RR: relative risk

Supplementary Figure S10. Meta-regression for the effect of increased circulatory arrest times on renal failure as a measure of end-organ damage.



I^2=89%, p<0.001.

Supplementary Figure S11. Funnel plots for early mortality and 10-year actuarial survival, assessing potential publication bias.



A: funnel plot for early mortality, B: funnel plot for 10-year survival.