

Concomitant CABG with Thoracic Aortic Aneurysm Repair Increases Risk of Stroke and Post Operative Complications

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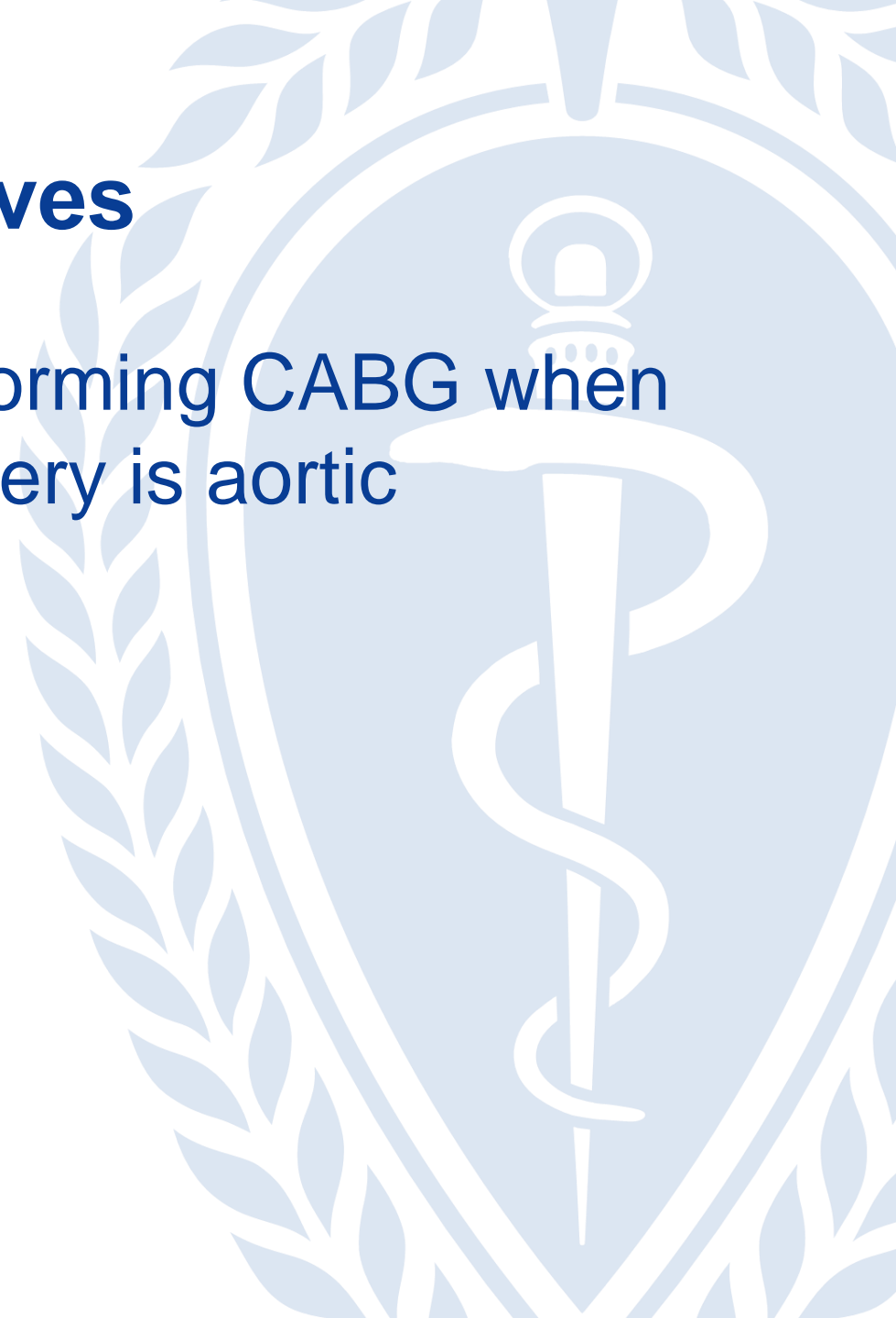


Background

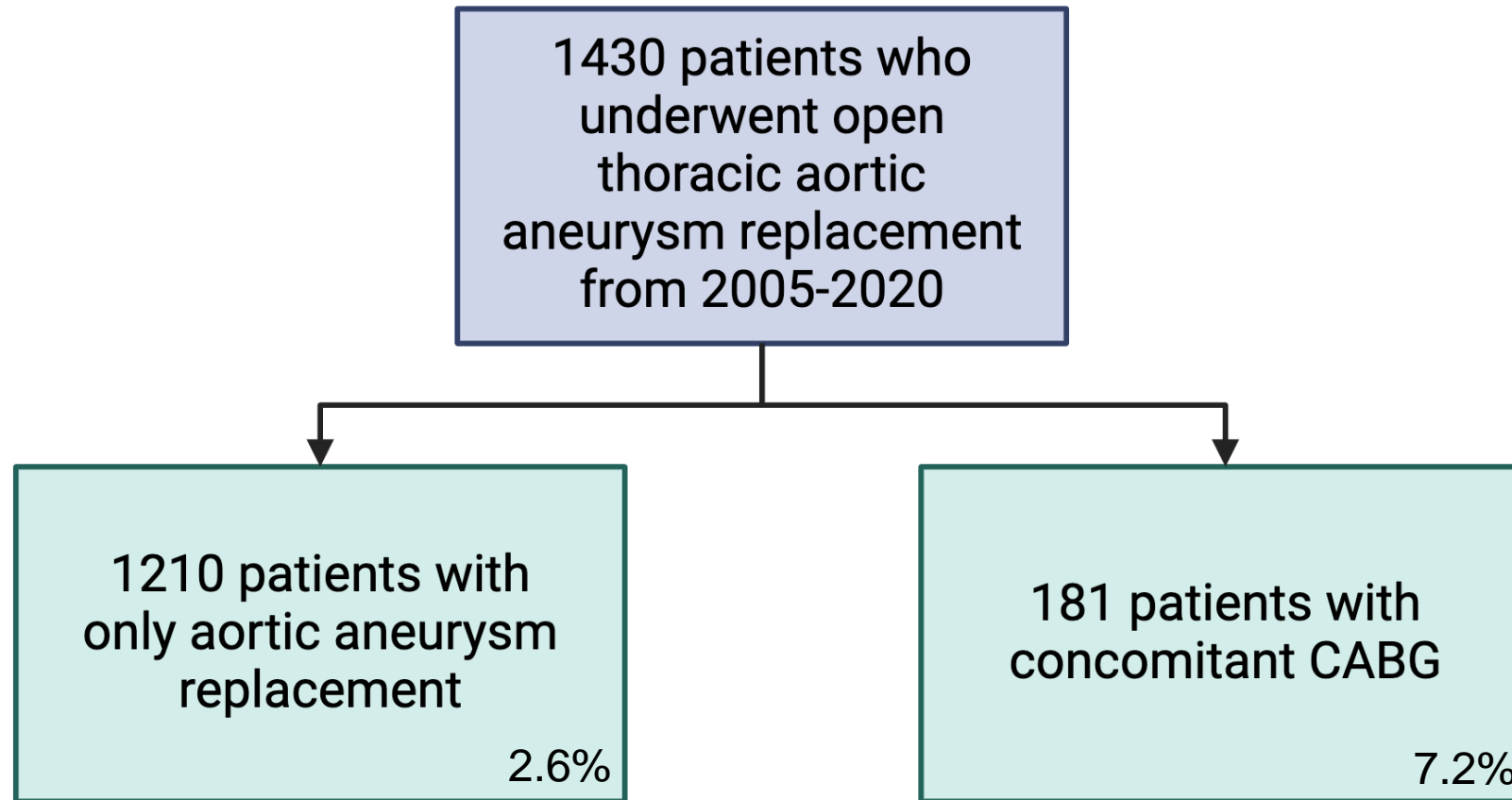
- Though literature is limited, prior studies have established the general safety of coronary artery bypass graft (CABG) during planned thoracic aneurysm repair^{1,2,3,4}.
- However, these studies suffer from small sample sizes and do not distinguish primary indication for surgery. As a result, they fail to accurately estimate the added risk of performing a CABG during TAA repair.
- This finding is also discordant with clinical practice, as longer, more intricate operations likely have worse clinical outcomes

Hypothesis/Objectives

- To determine the added risk of performing CABG when the primary indication for open surgery is aortic aneurysm repair.

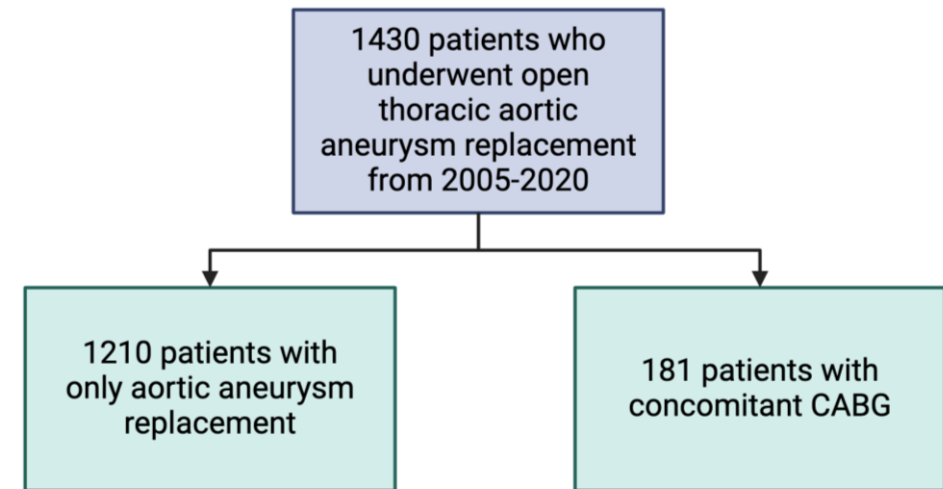


Methods: Patients (Total alongside percent operative mortality)



Methods: Endpoints and Statistics

- 2:1 propensity score matching was used to compare aneurysm vs aneurysm/CABG patients when primary indication for surgery was aortic disease. Multivariable regression to study postoperative complications and long-term mortality using Kaplan-Meier (KM) curve



Details of Concomitant CABG and Comparison of pre-matched outcomes

N = 181	
Number of CABG Grafts	
1	110 (61%)
2	51 (28%)
3	18 (9.9%)
4	2 (1.1%)
LIMA-LAD	103 (59%)
SVG-LAD	4 (2.3%)
SVG-RCA	12 (6.9%)
SVG-PDA	60 (34%)
SVG-OM	29 (17%)
SVG-DIAG	9 (5.1%)

	Aneurysm	CABG/Aneurysm	P-value
n	1,210	181	
Postop respiratory failure	108 (8.9%)	41 (23%)	<0.001
Postop kidney failure	63 (5.2%)	21 (12%)	<0.001
Deep sternal infection	10 (0.8%)	3 (1.7%)	0.2
Postop stroke	47 (3.9%)	19 (10%)	<0.001
Reoperation for bleeding	52 (4.3%)	17 (9.4%)	0.003
30 day mortality	24 (2.0%)	10 (5.5%)	0.009

Matched baseline characteristics

	No Concomitant CABG, N = 362	Concomitant CABG, N = 181	Difference	p-value
Age	69.00 (61.00, 77.00)	69.00 (60.00, 76.00)	0.032	0.581
Gender			0.046	0.62
Male	302 (83%)	154 (85%)		
Female	60 (17%)	27 (15%)		
DM	49 (14%)	29 (16%)	-0.07	0.436
Dialysis	0 (0%)	0 (0%)	0	
HTN	318 (88%)	157 (87%)	0.033	0.714
COPD	51 (14%)	26 (14%)	-0.008	0.931
BAV	89 (25%)	45 (25%)	-0.006	0.944
PVD	70 (19%)	41 (23%)	-0.081	0.367
CVD	39 (11%)	22 (12%)	-0.043	0.631
Previous CABG	20 (5.5%)	13 (7.2%)	-0.068	0.446
Previous MI	23 (6.4%)	13 (7.2%)	-0.033	0.714
Afib	56 (15%)	33 (18%)	-0.074	0.412
Reoperation	35 (9.7%)	23 (13%)	-0.097	0.28

Matched operative details

Characteristic	No Concomitant CABG, N = 362	Concomitant CABG, N = 181	Difference	p-value ³
CPB time (median[IQR])	126 (99, 166)	150 (117, 197)	-0.42	<0.001
Aortic cross clamp time in minutes (median[IQR])	91 (69, 124)	112 (90, 141)	-0.41	<0.001
Circulatory arrest used	153 (42%)	76 (42%)	0.01	>0.9
Concomitant AV procedure			0.19	0.2
None	222 (61%)	116 (64%)		
Bioprosthetic replacement	76 (21%)	38 (21%)		
Mechanical replacemnet	0 (0%)	2 (1.1%)		
Repair	64 (18%)	24 (13%)		
Concomitant MV procedure			0.18	0.3
None	332 (92%)	162 (90%)		
Bioprosthetic replacement	7 (1.9%)	7 (3.9%)		
Mechanical replacemnet	3 (0.8%)	0 (0%)		
Repair	20 (5.5%)	12 (6.6%)		
Location of aortic replacement			0.15	0.5
Ascending	72 (20%)	43 (24%)		
Partial arch	119 (33%)	50 (28%)		
Root	128 (35%)	62 (34%)		
Total arch	43 (12%)	26 (14%)		

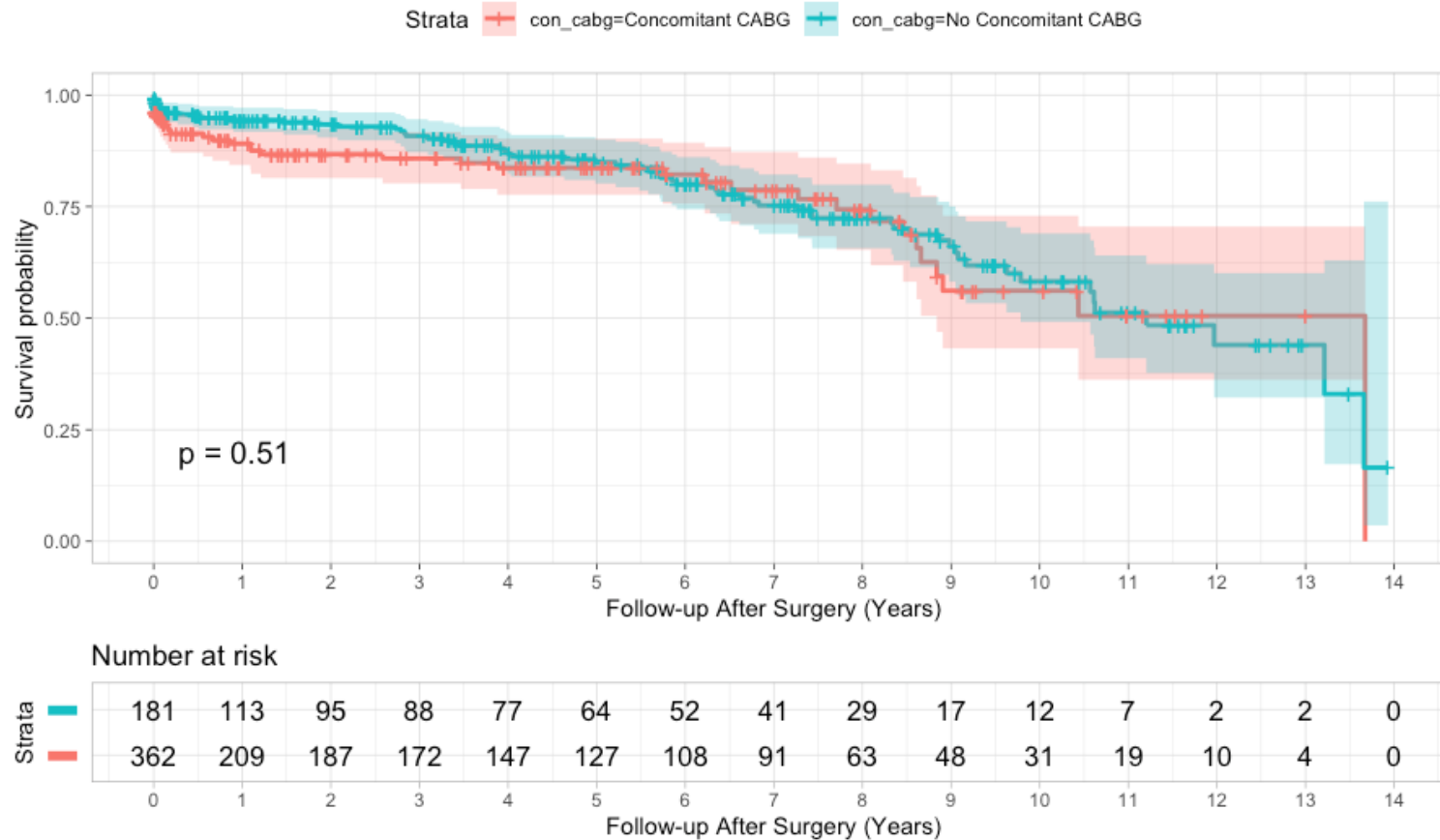
Results

After PSM, multivariable regression shows increased complications in CABG/aneurysm group

Characteristic	No Concomitant CABG, N = 362 ¹	Concomitant CABG, N = 181	p-value
Postop respiratory failure	32 (8.8%)	41 (23%)	<0.001
Postop kidney failure	17 (4.7%)	21 (12%)	0.003
Deep sternal infection	1 (0.3%)	3 (1.7%)	0.11
Postop stroke	11 (3.0%)	19 (10%)	<0.001
Reoperation for bleeding	13 (3.6%)	17 (9.4%)	0.005
Operative mortality	13 (3.6%)	13 (7.2%)	0.065
30-day mortality	10 (2.8%)	10 (5.5%)	0.11

Long term survival

Weighted KM curve shows similar survival probability in CABG/aneurysm group ($p = 0.51$)



Conclusions

- When performing aortic aneurysm repair, concomitant CABG confers an added risk of stroke and respiratory failure.

1. Robinson NB, Hameed I, Naik A, Ishtiaq MF, Rahouma M, Girardi LN, Gaudino M. Effect of Concomitant Coronary Artery Bypass Grafting on Outcomes of Ascending Aorta Replacement. *Ann Thorac Surg.* 2020 Dec;110(6):2041-2046. doi: 10.1016/j.athoracsur.2020.03.070. Epub 2020 Apr 25. PMID: 32343949; PMCID: PMC7799918.
2. Idrees JJ, Roselli EE, Blackstone EH, Lowry AM, Soltesz EG, Johnston DR, Tong MZ, Pettersson GB, Griffin B, Gillinov AM, Svensson LG. Risk of adding prophylactic aorta replacement to a cardiac operation. *J Thorac Cardiovasc Surg.* 2020 May;159(5):1669-1678.e10. doi: 10.1016/j.jtcvs.2019.05.001. Epub 2019 May 18. PMID: 31256966.
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4. Narayan P, Rogers CA, Caputo M, Angelini GD, Bryan AJ. Influence of concomitant coronary artery bypass graft on outcome of surgery of the ascending aorta/arch. *Heart.* 2007 Feb;93(2):232-7. doi: 10.1136/hrt.2006.090860. Epub 2006 Aug 16. PMID: 16914487; PMCID: PMC1861367.