



# Weill Cornell Medicine

## Cardiothoracic Surgery

# Risk of Distal Aortic Reoperation After Isolated Ascending Aortic/Root Aneurysm Repair Among Patients with Heritable, Bicuspid or Other Aortopathies

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Nothing to disclose.



# Background

- Patients undergoing proximal aortic repair are at potential risk for aneurysmal degeneration of the distal aorta, requiring a higher risk arch reoperation
- An extensive initial arch operation may decrease risk of arch reoperation but increase operative risk
- There is limited data on differences in the risk of distal aortic reoperation in patients with:
  - Bicuspid aortopathy (BAV)
  - Connective tissue disorders (CTD)
  - Non-heritable aortopathy (Other)



# Objective

To compare the risk of reoperation in patients with bicuspid aortopathy (BAV), connective tissue disorder (CTD), and non-heritable aortopathy (other).

To identify groups that may benefit from a more extensive arch operation at the primary procedure

# Methods

Retrospective, single-center cohort study

Identified consecutive patients undergoing ascending aortic replacement with/without root replacement from 1997-2023

- Patients with arch replacement or aortic dissection were excluded
- 2211 patient included in the study
  - 878 had BAV
  - 189 had CTD
  - 1144 were Others with non-heritable aneurysms
- Primary outcome: Need for arch reoperation

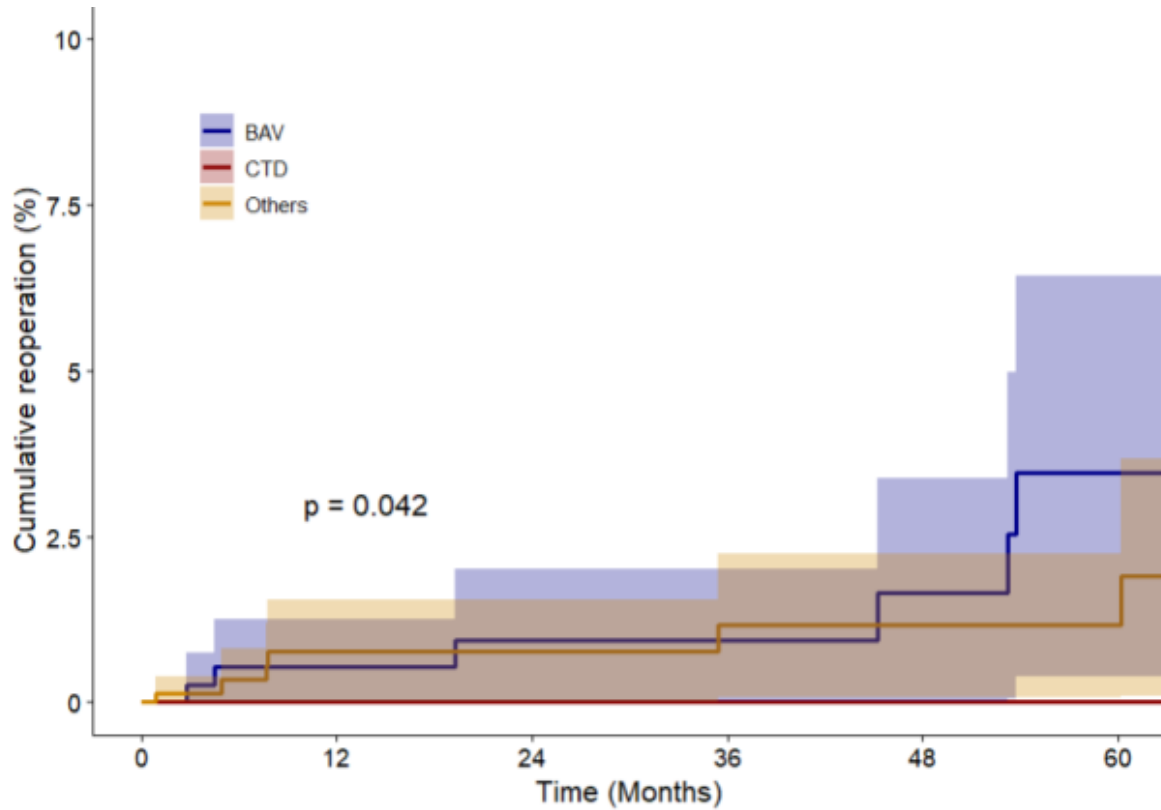
Baseline patient characteristics (n, %)	BAV (n=878)	CTD (n=189)	Other (n=1144)	p
Age (median [IQR])	57.0 [47.0, 65.0]	42.0 [30.0, 53.0]	63.0 [53.0, 71.0]	<0.001
Male sex	728 (82.9)	110 (58.2)	962 ( 84.1)	<0.001
Smoking history	247 (28.1)	29 ( 15.3)	474 ( 41.4)	<0.001
NYHA Class III/IV	313 (35.6)	31 (16.4)	347 ( 30.3)	<0.001
Hypertension	714 (81.5)	78 (41.3)	1021 ( 89.4)	<0.001
Prior myocardial infarction	39 (4.4)	4 (2.1)	129 ( 11.3)	<0.001
COPD	43 (4.9)	11 (5.8)	87 ( 7.6)	0.045
Diabetes	42 (4.8)	6 (3.2)	132 ( 11.5)	<0.001
Previous CVA	41 (4.7)	15 (7.9)	132 ( 11.5)	<0.001
Preoperative renal impairment	30 (3.4)	5 (2.6)	141 ( 12.3)	<0.001
Preoperative shock	4 (0.5)	1 (0.5)	8 (0.7)	0.772
Aneurysm size (median [IQR])	5.3 [4.9, 5.4]	5.4 [5.1, 5.8]	5.4 [5.1, 5.8]	<0.001
Rupture	2 (0.2)	2 (1.1)	16 (1.4)	0.022
Status of aortic valve				<0.001
Aortic insufficiency	472 (53.8)	178 (94.2)	970 (84.9)	
Aortic stenosis	389 (44.3)	2 (1.1)	88 (7.7)	
Normal	17 (1.9)	9 (4.8)	84 (7.4)	
Dissection				<0.001
Chronic	5 (0.6)	8 (4.2)	51 (4.5)	
None	873 (99.4)	180 (95.2)	1089 (95.3)	
Subacute	0 (0.0)	1 (0.5)	3 (0.3)	

- Patients with CTD were younger, more likely to be female, and had fewer comorbidities
- CTD had more aortic insufficiency
- BAV had more aortic stenosis

Operative characteristics (n, %)	BAV (n=878)	CTD (n=189)	Other (n=1144)	p
CPB time (median [IQR])	112.0 [93.0, 131.0]	132.0 [120.0, 153.0]	124.0 [104.0, 145.0]	<0.001
Cardiac ischemic time (median [IQR])	90.0 [74.0, 107.0]	112.0 [100.0, 128.0]	101.0 [81.0, 118.0]	<0.001
Valve replacement type				<0.001
Bovine	601 (68.5)	17 (9.0)	482 (42.1)	
Mechanical	92 (10.5)	57 (30.2)	178 (15.6)	
None	171 (19.5)	110 (58.2)	458 (40.0)	
Porcine	14 (1.6)	5 (2.6)	26 (2.3)	
Concomitant CABG	74 (8.4)	8 (4.2)	172 (15.0)	<0.001
Concomitant MVR	5 (0.6)	13 (7.0)	25 (2.3)	<0.001



**CTD patients required longer cardiopulmonary bypass and cross-clamp time due more use of valve-sparing root replacement**

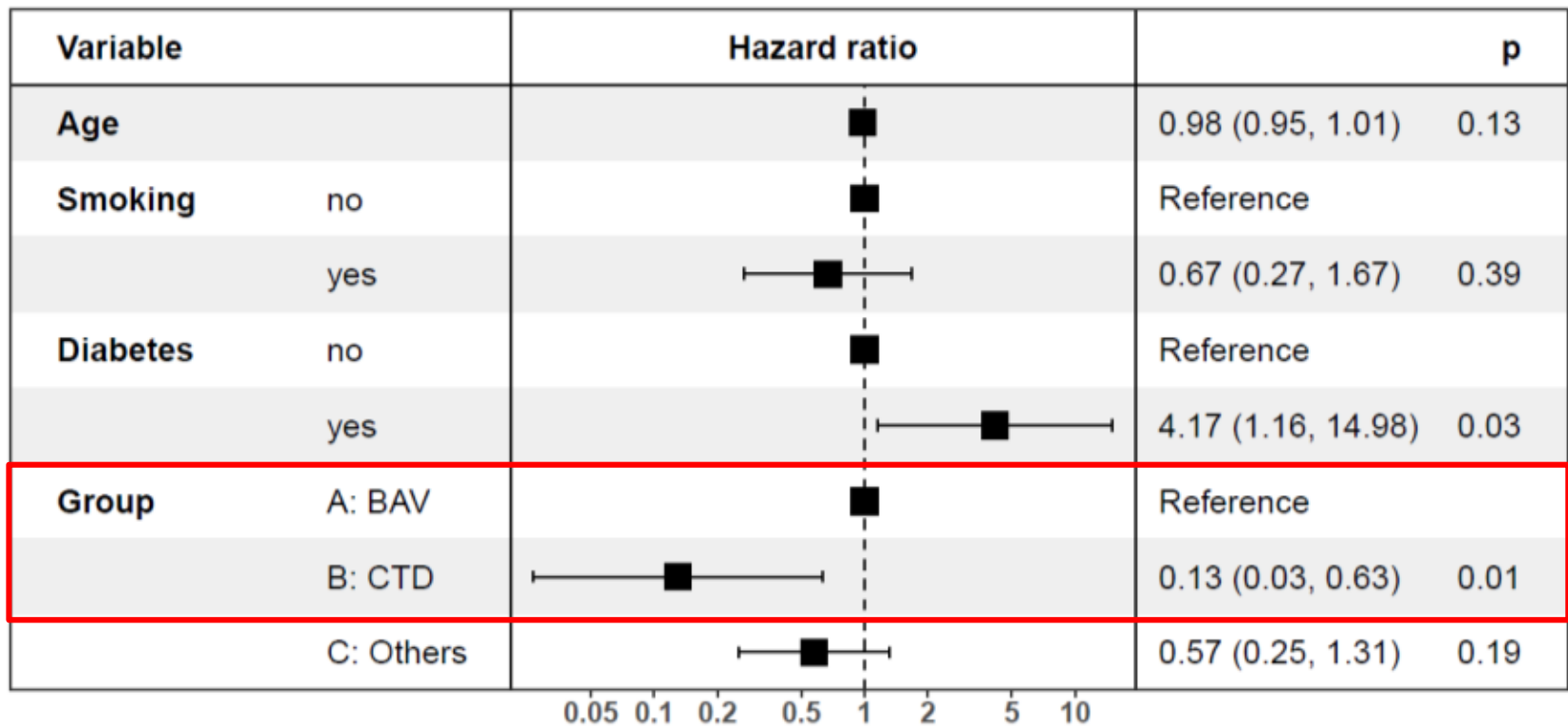


Number at risk

BAV	878	334	236	171	129	84
CTD	189	99	85	77	67	55
Others	1144	433	318	251	188	134

The overall need for reoperation was low at five-year follow-up, but was highest in BAV patients (1.5% versus 1.2% in Others and 1.1% in CTD patients,  $p=0.042$ )





**CTD was associated with lower reoperation hazard  
(HR 0.13, 95% CI 0.03-0.63; p=0.01)**

## Conclusions

- Patients with CTD are at minimal risk of needing an arch reoperation after proximal aortic repair in the absence of aortic dissection
- BAV patients are at increased risk of needing arch reoperations after isolated ascending/root replacement
- Careful consideration should be given to arch replacement during the initial ascending aortic operation in patients with bicuspid aortopathy



# Thank you



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