



# **Weill Cornell Medicine**

## Cardiothoracic Surgery

# **The Relationship of Sex and Aortic Diameter at the Time of Type A Aortic Dissection**

Lamia Harik, MD, Mario Gaudino, MD, PhD, Mohammed Rahouma, MD, Arnaldo Dimagli, MD, Roberto Perezgrovas-Olaria, MD, Kevin R. An, MD, Talal Alzghari, MD, Giovanni Jr. Soletti, MD, Gianmarco Cancelli, MD, Charles Mack, MD, Leonard N. Girardi, MD, Christopher Lau, MD

AATS Aortic Symposium 2024

Nothing to disclose.



# Background

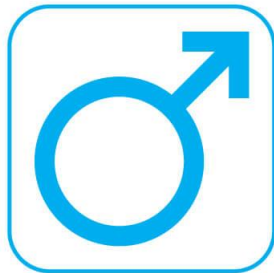
- Acute Type A aortic dissection (ATAAD) is the most common form of acute aortic syndrome, and carries high morbidity and mortality
- Previous literature has demonstrated worse outcomes in women undergoing some cardiac surgeries, such as CABG
- Reports of sex differences on operative outcomes of ATAAD have had mixed results
- While larger aortic diameter increases risk of ATAAD, there is concern that women are at risk of ATAAD at smaller aortic diameters than men due to generally smaller stature

# Objective

- We sought to evaluate differences among women and men undergoing repair of ATAAD
  - Preoperative risk factors
  - Aortic diameter
  - Operative management
  - Peri-operative outcomes
  - Long-term outcomes and survival



**VS**



# Methods

- Retrospective, single-center cohort study of 390 consecutive patients undergoing repair of ATAAD from 1997-2022
- Stratified by sex (150 women and 240 men)
- *Primary Outcome:* aortic diameter at time of presentation with ATAAD
- *Secondary Outcomes:* operative mortality, myocardial infarction, stroke, hemodialysis, tracheostomy, re-exploration for bleeding, composite of major adverse events, and long-term survival

	Overall (n=390)	Women (n=150)	Men (n=240)	p-value
Age (median [IQR])	65.00 [52.0, 74.0]	70.5 [59.0, 78.0]	61.0 [50.0, 70.0]	<0.001
BMI (median [IQR])	27.30 [23.9, 31.5]	25.4 [21.9, 29.2]	28.6 [25.1, 32.3]	<0.001
Smoking (%)	222 (56.9)	66 (44.0)	156 (65.0)	<0.001
Prior revascularization (%)	44 (11.3)	12 (8.0)	32 (13.3)	0.15
Hypertension (%)	364 (93.3)	141 (94.0)	223 (92.9)	0.84
COPD (%)	70 (17.9)	29 (19.3)	41 (17.1)	0.67
Prior stroke (%)	68 (17.4)	29 (19.3)	39 (16.2)	0.52
PVD (%)	35 (9.0)	7 (4.7)	28 (11.7)	0.03
Diabetes (%)	56 (14.4)	26 (17.3)	30 (12.5)	0.24
EF (median [IQR])	50.00 [45.0, 50.0]	50.0 [45.0, 50.0]	50.0 [40.0, 50.0]	0.11
Renal insufficiency (%)	121 (31.0)	33 (22.0)	88 (36.7)	0.003
Family history of aneurysm	14 (3.6)	6 (4.0)	8 (3.3)	0.69
Family history of dissection	20 (5.1)	6 (4.0)	14 (5.8)	0.69
CTD (%)	25 (6.4)	12 (8.0)	13 (5.4)	0.42
Prior cardiac surgery (%)	68 (17.4)	29 (19.3)	39 (16.2)	0.52
Hemodynamic Shock (%)		29 (19.3)	33 (13.8)	0.19
Urgent/emergent procedure (%)	371 (95.1)	143 (95.3)	228 (95.0)	1

## Preoperative Risk Factors

**Women were older**

**Men had higher BMI and higher incidence of smoking, PVD, and renal insufficiency**

	Overall (n=390)	Women (n=150)	Men (n=240)	p
Major adverse events (%)	63 (16.2)	25 (16.7)	38 (5.8)	0.93
Mortality (%)	20 (5.1)	9 (6.0)	11 (4.6)	0.70
Myocardial infarction (%)	5 (1.3)	1 (0.7)	4 (1.7)	0.65
CVA (%)	8 (2.1)	2 (1.3)	6 (2.5)	0.67
Tracheostomy (%)	17 (4.4)	8 (5.3)	9 (3.8)	0.62
Dialysis (%)	17 (4.4)	7 (4.7)	10 (4.2)	1
Reoperation for bleeding (%)	31 (7.9)	13 (8.7)	18 (7.5)	0.82

**There was no difference in the incidence of major adverse events between women and men**

**Age and NYHA Class III/IV were independently associated with major adverse events, but sex was not associated**

	Odds Ratio (95% CI)	p
Age	1.04 (1.02-.07)	<0.01
Sex (male)	0.75 (0.07-7.39)	0.81
Diabetes	1.84 (0.87-3.76)	0.10
Urgent/emergent procedure	0.53 (0.16-1.94)	0.31
NYHA Class III/IV	4.44 (2.43-8.31)	0.001
Procedure year	0.87 (0.45-1.64)	0.67
Aneurysm size	1.01 (0.68-1.46)	0.96

**Primary outcome:**  
**No difference** in median aortic diameter at the time of dissection, even after adjustment for BMI.

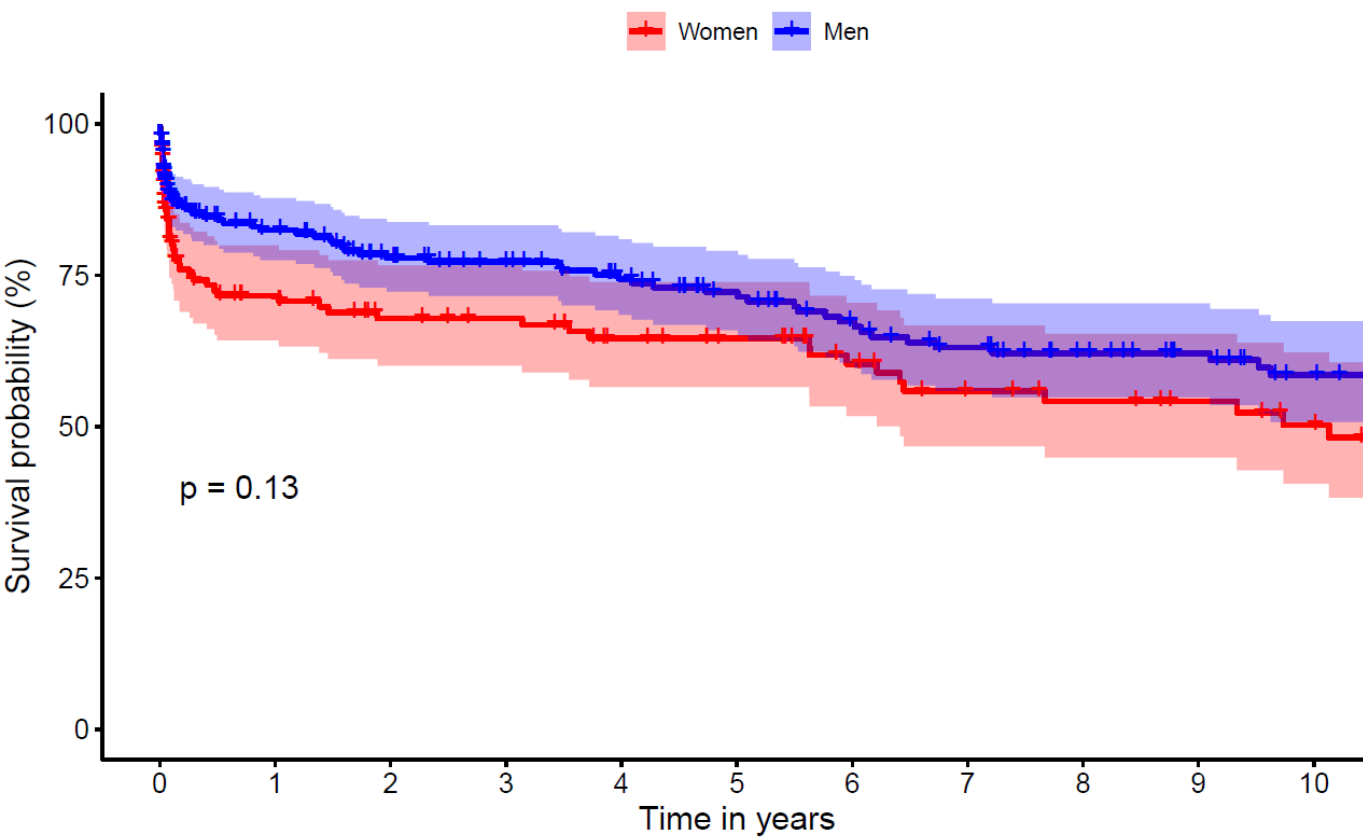
**COPD and EF were associated with aneurysm diameter.**

**Sex was not associated with larger aneurysm diameter.**

	Overall (n=390)	Women (n=150)	Men (n=240)	p
Aneurysm size (median [IQR])	5.30 [4.8, 6.1]	5.2 [4.6, 5.9]	5.3 [4.9, 6.1]	0.12
Aneurysm size adjusted by BMI (median [IQR])	5.6 [5.5, 5.7]	5.4 [4.9, 5.8]	5.7 [5.4, 6.1]	0.19

	Coefficient (95% CI)	p
Age	0.006 (-0.003;0.015)	0.21
Sex (male)	0.140 (-0.117;0.398)	0.29
COPD	0.425 (0.086;0.764)	0.01
Diabetes	-0.144 (-0.496;0.207)	0.42
Hypertension	-0.210 (-0.748;0.327)	0.44
Preoperative renal impairment	-0.032 (-0.314; 0.250)	0.82
Ejection fraction	-0.013 (-0.027; -0.000)	0.05





**There was no difference  
in ten-year survival  
between women and  
men (50.3% vs 58.5%)**

Number at risk

150	79	68	65	56	51	42	35	32	29	25
240	148	128	116	105	92	80	71	62	54	45

# Conclusions

- There was no difference in aneurysm size at the time of presentation of ATAAD between women and men, even after adjustment for BMI.
- There was no relationship between aneurysm size and sex.
- Despite smaller body size in women, recommendations for aortic intervention, which are based on aortic diameter, may not require adjustment for sex.
- Although women and men present with differing risk factor profiles, similar operative and long-term outcomes can be achieved.

# Thank you



**Weill Cornell Medicine**