



Association Of Preoperative Aneurysmal Thrombus And Anatomic Predictors Of Type 2 Endoleak Development Following EVAR

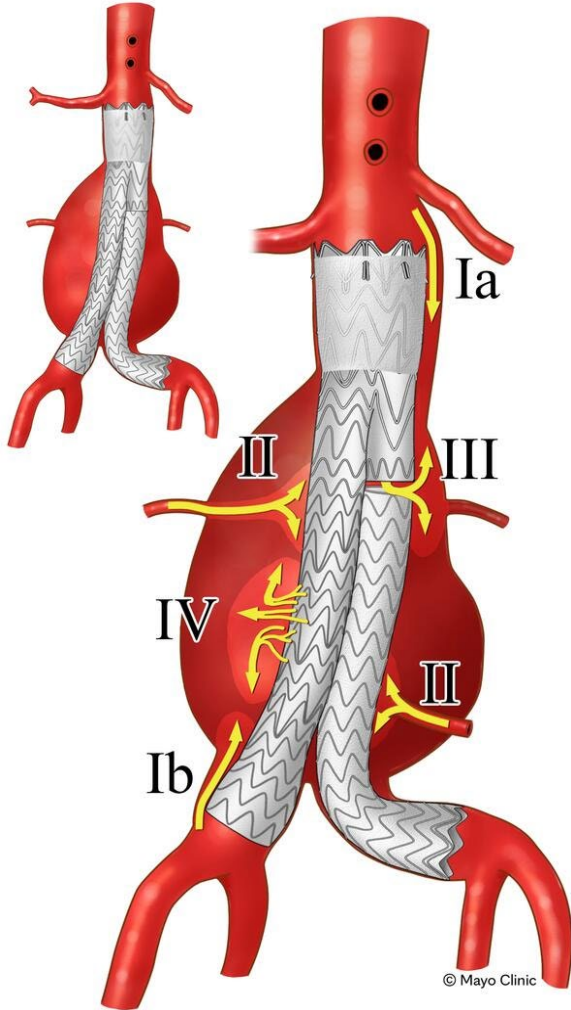
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DISCLOSURES

- None

BACKGROUND

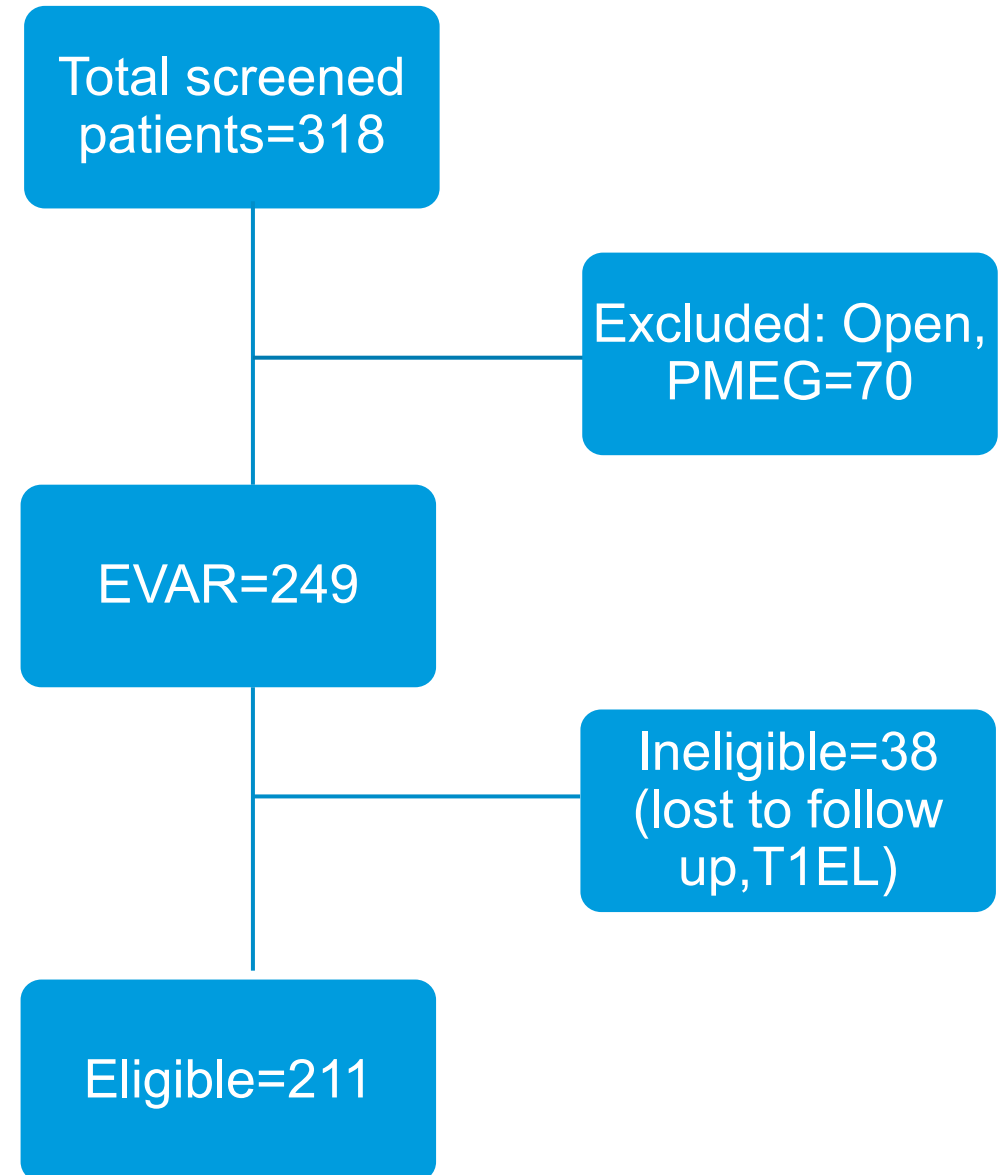


- Abdominal aortic aneurysms are mostly treated by endovascular repair (EVAR)
- Type II endoleak (T2EL) complicates 20-40% of EVARs, yet preoperative risk stratification remains limited
- A persistent T2EL can be associated with aneurysm sac growth and places the patient at a risk for aortic rupture
- The objective of our study was to identify anatomical and clinical predictors of T2EL following EVAR

METHODS

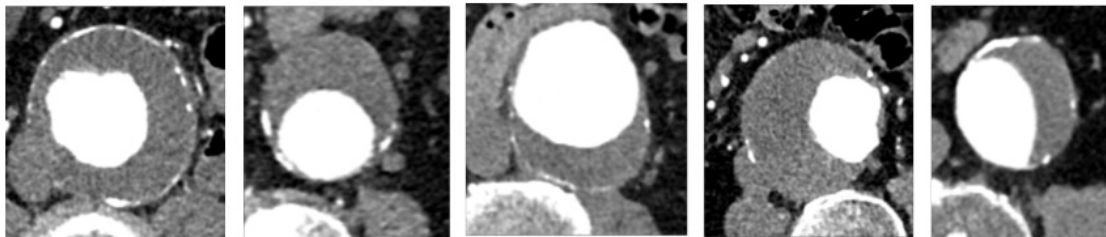
This was a single-center retrospective cohort of patients who underwent EVAR (May, 2007–June, 2025)

- Primary outcome was the presence of new or persistent T2EL

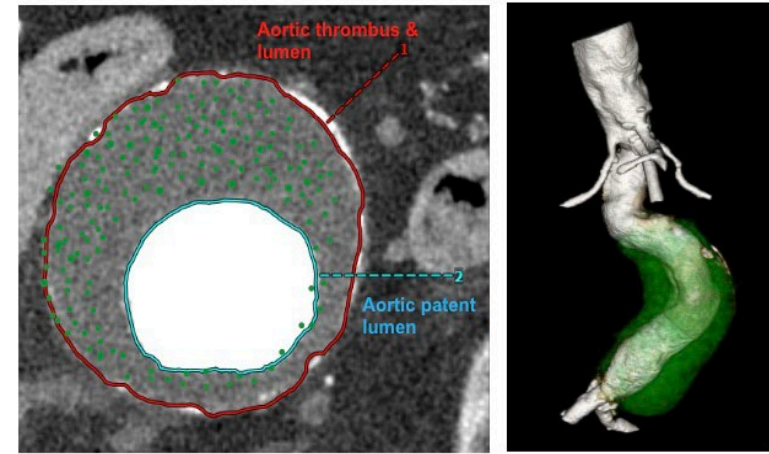


METHODS

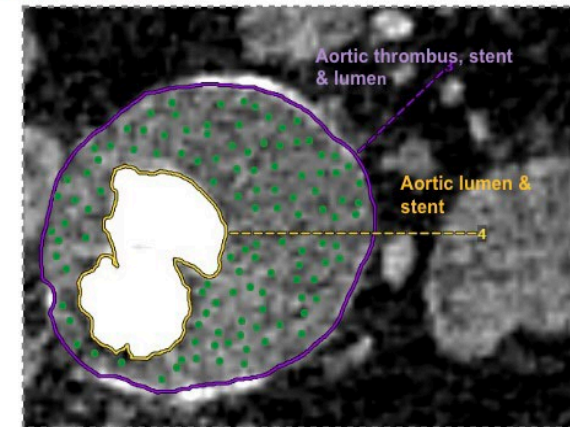
- Pre-operative CTA and Visage 7 software, were used to measure anatomical features:
 - IMA diameter
 - Number of patent lumbar arteries
 - Proximal neck characteristics
 - Thrombus volume and distribution



Circumferential Anterior Posterior Right Left



PreOp 2/24/2025 **Aortic thrombus & lumen** - **Aortic patent lumen** = **Thrombus**
 $180.2 - 75.0 = 105.2$



PostOp 3/7/2025 **Aortic thrombus, stent & lumen** - **Aortic lumen & stent** = **Thrombus**
 $178.5 - 62.3 = 116.2$, NO T2EL

BASELINE PATIENT DEMOGRAPHICS

- T2EL group patients were older
- T2EL higher use of anticoagulation therapy

	No T2EL(N=129)	T2EL (N=82)	p value
Age			< 0.01
Mean (SD)	73.42 (8.35)	77.11 (8.10)	
Median (Q1, Q3)	74.00 (68.37, 79.56)	77.11 (73.56, 82.57)	
Sex			0.18
Male	106 (82.2%)	73 (89.0%)	
Female	23 (17.8%)	9 (11.0%)	
Body mass index			0.54
Mean (SD)	27.67 (5.12)	28.22 (5.02)	
Median (Q1, Q3)	27.40 (24.58, 30.07)	28.55 (24.88, 30.79)	
Hypertension	105 (81.4%)	66 (80.5%)	0.87
Diabetes mellitus	16 (12.4%)	11 (13.4%)	0.83
Hyperlipidemia	103 (79.8%)	66 (80.5%)	0.91
Former smoker	80 (62.0%)	52 (63.4%)	0.84
Current smoker	26 (20.2%)	11 (13.4%)	0.21
Chronic kidney disease	48 (37.2%)	25 (30.5%)	0.32
Coronary artery disease	60 (46.5%)	33 (40.2%)	0.37
Myocardial infarction	28 (21.7%)	15 (18.3%)	0.55
Atrial fibrillation	21 (16.3%)	14 (17.1%)	0.88
Use of antiplatelet drugs	87 (67.4%)	56 (68.3%)	0.9
Use of anticoagulants	14 (10.9%)	18 (22.0%)	0.03
Charlson Comorbidity Index			0.26
Mean (SD)	5.04 (2.13)	5.26 (2.26)	
Median (Q1, Q3)	5.00 (3.00, 6.00)	5.00 (4.00, 6.00)	
Chronic heart failure	15 (11.6%)	7 (8.5%)	0.47
Peripheral vascular disease	34 (26.4%)	15 (18.3%)	0.18
Chronic obstructive pulmonary disease	29 (22.5%)	15 (18.3%)	0.47

PREOPERATIVE AORTIC AND THROMBUS CHARACTERISTICS

- T2EL group had larger IMA diameter and a greater number of patent lumbar arteries
- T2EL showed decreased thrombus volume compared to the No T2EL group
- T2EL was associated with reduced circumferential thrombus distribution

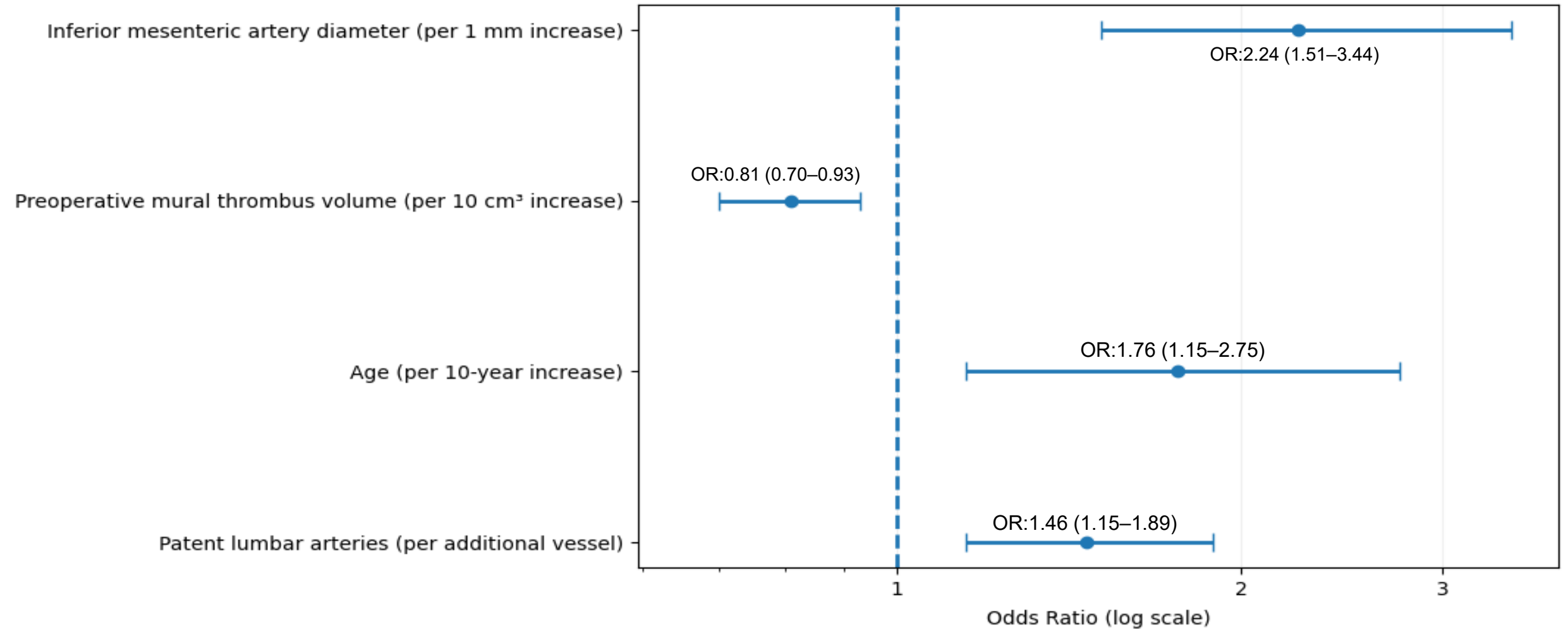
	No T2EL(N=129)	T2EL (N=82)	p value
Pre-operative aortic size (cm)			0.22
Mean (SD)	5.16 (0.81)	5.19 (0.92)	
Median (Q1, Q3)	5.10 (5.00, 5.40)	5.20 (5.00, 5.50)	
Pre-operative aortic volume (cm³)			0.1
Mean (SD)	117.64 (50.99)	106.86 (40.98)	
Median (Q1, Q3)	111.60 (90.40, 144.30)	98.10 (80.82, 131.50)	
Pre-operative aortic lumen volume (cm³)			0.74
Mean (SD)	67.43 (26.20)	74.25 (30.11)	
Median (Q1, Q3)	68.20 (48.50, 80.80)	70.40 (51.90, 91.88)	
Pre-operative aortic thrombus volume (cm³)			< 0.01
Mean (SD)	50.21 (37.89)	32.61 (28.94)	
Median (Q1, Q3)	44.10 (23.20, 67.50)	27.50 (14.15, 45.73)	
Pre-operative aortic thrombus distribution			0.03
Anterior	25 (19.4%)	17 (20.7%)	0.87
Circumferential	32 (24.8%)	6 (7.3%)	<0.01
Left	23 (17.8%)	16 (19.5%)	0.81
Posterior	18 (14.0%)	15 (18.3%)	0.43
Right	12 (9.3%)	15 (18.3%)	0.06
No thrombus	19 (14.7%)	13 (15.9%)	
Pre-operative number of patent lumbar			< 0.01
Mean (SD)	5.02 (1.31)	5.55 (1.04)	
Median (Q1, Q3)	5.00 (4.00, 6.00)	6.00 (5.00, 6.00)	
Pre-operative size of patent lumbar			0.1
Mean (SD)	2.50 (0.74)	2.62 (0.76)	
Median (Q1, Q3)	2.40 (2.00, 3.00)	2.47 (2.15, 2.90)	
Pre-operative size of the IMA			< 0.01
Mean (SD)	2.89 (0.86)	3.49 (0.84)	
Median (Q1, Q3)	2.80 (2.30, 3.40)	3.45 (3.01, 3.93)	

ANEURYSM CHARACTERISTICS

- Increased angulation reflects more challenging proximal neck morphology
- Aortic angulation was higher in the T2EL group

	No T2EL(N=129)	T2EL (N=82)	p value
Angulation			0.04
Mean (SD)	29.21 (19.01)	30.82 (16.25)	
Median (Q1, Q3)	23.00 (15.00, 43.60)	28.90 (16.52, 44.60)	
Neck diameter			0.16
Mean (SD)	22.60 (3.30)	23.40 (3.95)	
Median (Q1, Q3)	22.50 (20.20, 25.40)	22.90 (20.92, 24.62)	
Right landing zone diameter			0.06
Mean (SD)	14.50 (3.25)	15.46 (3.38)	
Median (Q1, Q3)	13.90 (12.20, 16.50)	15.20 (13.22, 17.10)	
Left landing zone diameter			0.04
Mean (SD)	14.04 (3.19)	14.99 (2.73)	
Median (Q1, Q3)	13.70 (12.00, 15.60)	14.75 (13.22, 16.78)	
IFU compliant	99 (76.7%)	71 (86.6%)	0.08
Type of prosthesis			0.83
Zenith flex	60 (46.5%)	37 (45.1%)	0.84
Gore excluder	33 (25.6%)	27 (32.9%)	0.25
Medtronic endurant	17 (13.2%)	4 (4.9%)	0.05
Endologix	12 (9.3%)	7 (8.5%)	0.85
Terumo aortic	5 (3.9%)	4 (4.9%)	0.73
Trivascular	2 (1.6%)	2 (2.4%)	0.64

T2EL PREDICTORS



STUDY LIMITATIONS

- Single center, retrospective study
- External validation and prospective studies are needed to assess clinical utility for risk-adapted surveillance protocols

CONCLUSIONS

- Larger IMA diameter, reduced thrombus volume, advanced age, and more patent lumbar arteries are independent predictors of T2EL after EVAR
- Clinically meaningful thresholds will enable preoperative risk stratification from routine CTA



THANK YOU

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