

# **Thoracic Endovascular Aortic Repair for Penetrating Aortic Trauma**

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# Disclosures

- None



# Aortic Trauma

- Aortic injury is one of the most common causes of death after traumatic injury
- Blunt aortic injury (BAI) was historically associated with in-hospital mortality rates  $>30\%$
- The advent of endovascular therapy significantly reduced mortality for BAI patients to  $<10\%$

# Aortic Trauma

- Penetrating (either from gun shot or stab wounds) aortic injury (PAI) has traditionally been treated via an open repair with mortality rates ~50%
- Case series have demonstrated the feasibility of TEVAR for PAI, though no large studies have established the characteristics associated with this injury pattern or outcomes of TEVAR

# Purpose

Determine outcomes associated with TEVAR for penetrating aortic injury and how these patients compare with blunt aortic injury patients



# Methods

- Vascular Quality Initiative (VQI) database from 2011-2022 for patients undergoing TEVAR
  - Patients with traumatic injuries included
  - Excluded patients with missing mechanism
- Baseline characteristics, zone and severity of aortic injury, and outcomes were recorded
- Compared BAI to PAI patients

# Study Population

- 1,867 patients -

73% Male

Age 39

Hypertension 27%

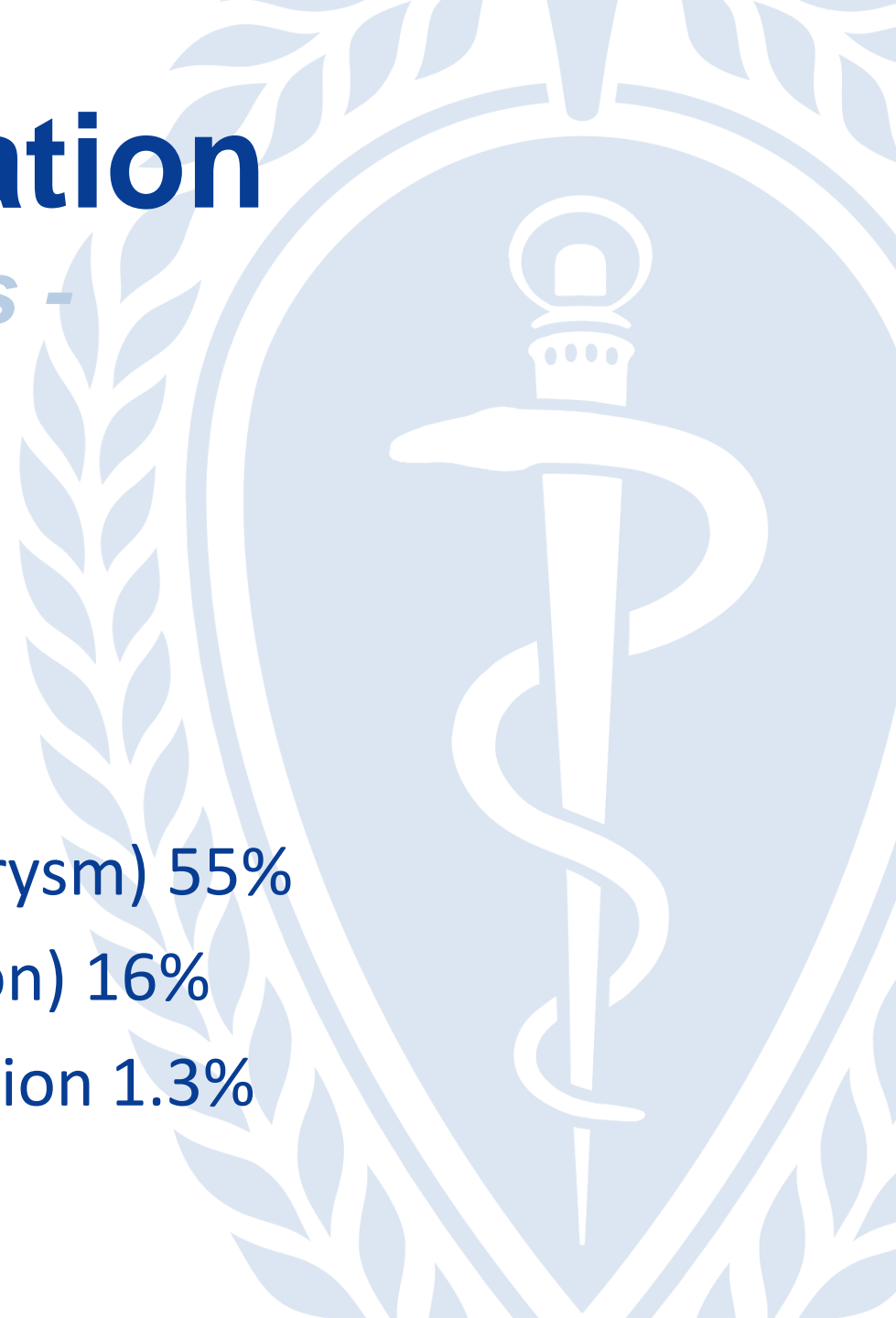
Smoker 33%

Grade 3 Injury (Pseudoaneurysm) 55%

Grade 4 Injury (Transection) 16%

Aortic Related Re-Intervention 1.3%

Death 8.2%



# BAI vs. PAI

	Blunt	Penetrating	
	1808	59	
Male	1332 (73.7%)	39 (66.1%)	0.195
Age	39.5 (28-57)	35 (23-59)	0.400
Race			<0.001
African American	344 (19.1%)	27 (45.8%)	
White	1143 (63.4%)	20 (33.9%)	
Other	316 (17.5%)	12 (20.3%)	



# BAI vs. PAI

Blunt

1808

Penetrating

59

Grade of Aortic Injury

1 – Intimal Tear

130 (7.5%)

4 (7.3%)

2 – Intramural Hematoma

310 (17.8%)

9 (16.4%)

3 – Pseudoaneurysm

1011 (58.2%)

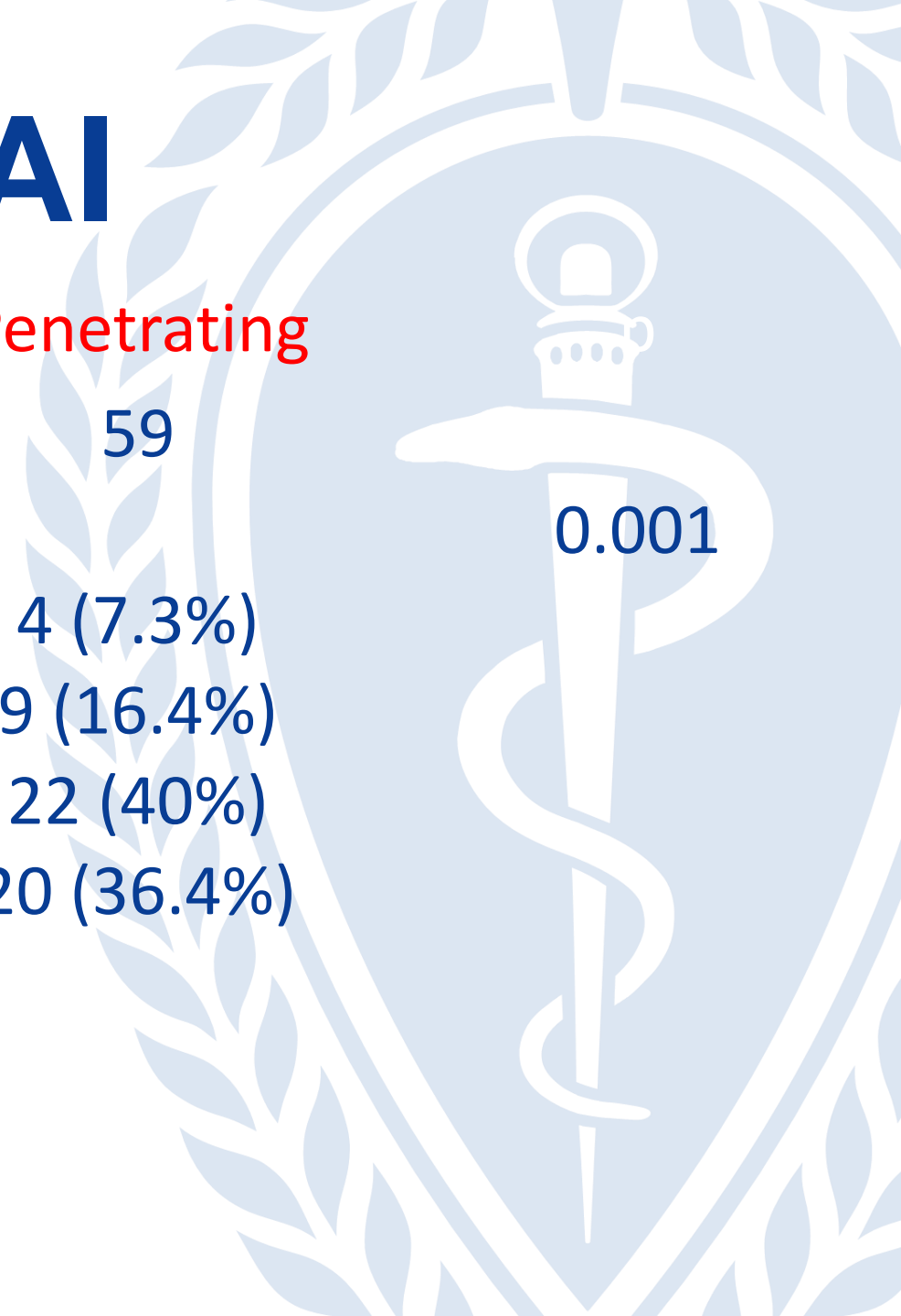
22 (40%)

4 – Transection

286 (16.5%)

20 (36.4%)

0.001



# BAI vs. PAI

Blunt

1808

Penetrating

59

## Proximal Extent of Injury

Zone 0

11 (0.6%)

1 (1.9%)

Zone 1

24 (1.4%)

1 (1.9%)

Zone 2

291 (17.1%)

7 (13.0%)

Zone 3

1130 (66.5%)

9 (16.7%)

Zone 4

204 (12%)

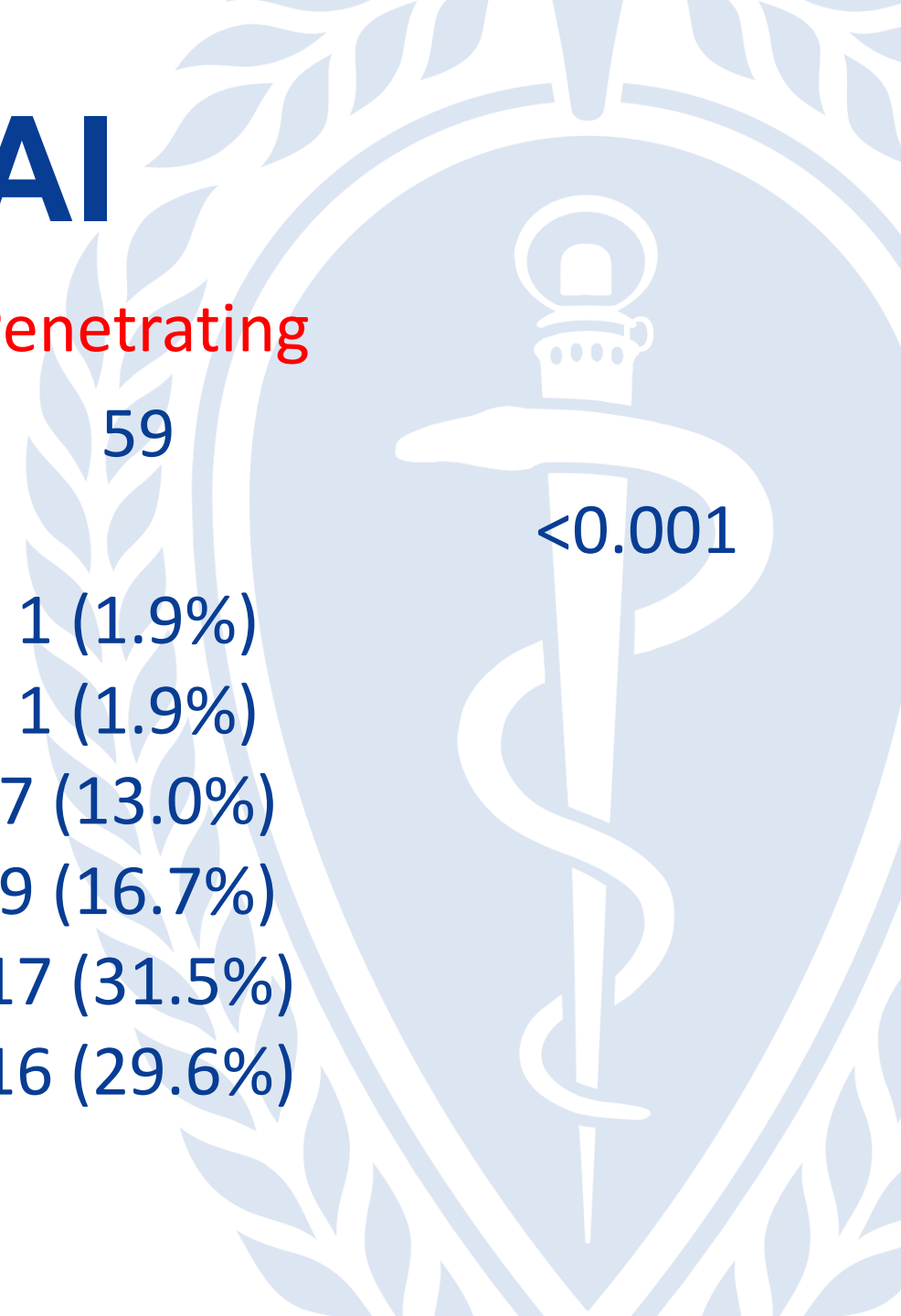
17 (31.5%)

Zone 5

37 (2.2%)

16 (29.6%)

<0.001



# BAI vs. PAI

	Blunt	Penetrating	p
	1808	59	
Any Complication	484 (26.9%)	15 (25.4%)	0.803
Spinal Ischemia	17 (1%)	0 (0)	0.755
Myocardial Infarction	30 (1.7%)	2 (3.4%)	0.434
Stroke	66 (3.7%)	3 (5.1%)	0.913
Dialysis	60 (3.4%)	3 (5.1%)	0.764
Aortic Related Re-Intervention	24 (1.3%)	0 (0)	0.236
Death	149 (8.2%)	5 (8.5%)	0.813

# Conclusions

- PAI occurs more commonly in zones 4-5 of the thoracic aorta and often presents with higher grade aortic injury when compared to BAI.
- TEVAR for PAI has excellent in-hospital survival (8.5% mortality) compared to historical mortality rates (~40-50%).
- An endovascular first approach may lead to improved survival for PAI.