

Calcium Paradox: Impact of Low Aortic Valve Calcium on 1-year Post-TAVR Mortality in Bicuspid Aortic Valve Patients

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Disclosure of Relevant Financial Relationships

I, [Xena Moore](#), DO NOT have any financial relationships to disclose.

Background

- Aortic valve calcium (AVC) burden is a **known bad prognostic marker** in aortic stenosis.
- Most studies show that **higher AVC = worse outcomes**, but this may differ in BAV anatomy
- **Low AVC** may represent a distinct, fibrotic, or under-calcified BAV phenotype

Objective

To investigate the impact of **low AVC on one-year mortality** following TAVR in BAV patients.

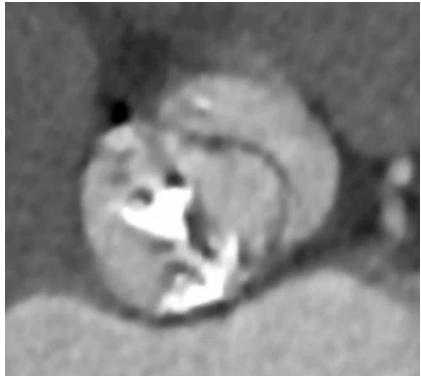
Methods

- **Single-center retrospective study**, 2012–2024
- **Excluded** the top 10% with extreme calcium ($>6,000$ AU) – due to known association with worst outcomes
- Remaining **248 BAV TAVR** patients were categorized as:
 - **Low AVC:** $<1,200$ AU (n=45)
 - **Intermediate AVC:** 1,200–6,000 AU (n=203)
- **Analyses:** t-tests, chi-square, Kaplan–Meier, and Cox regression for 1-year mortality

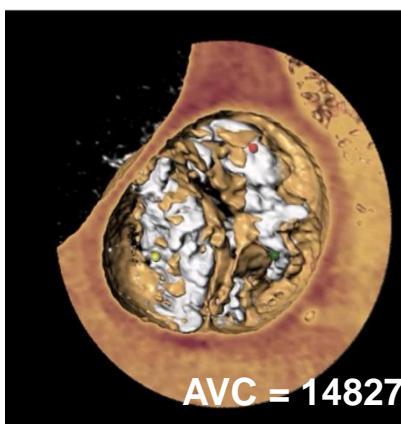
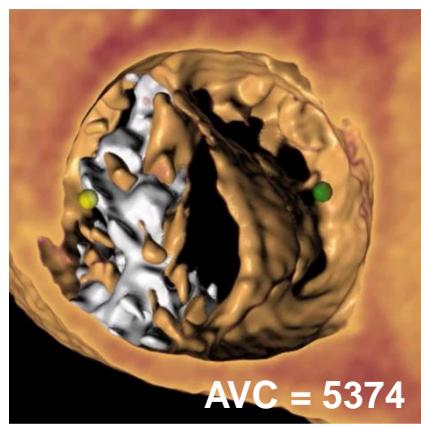
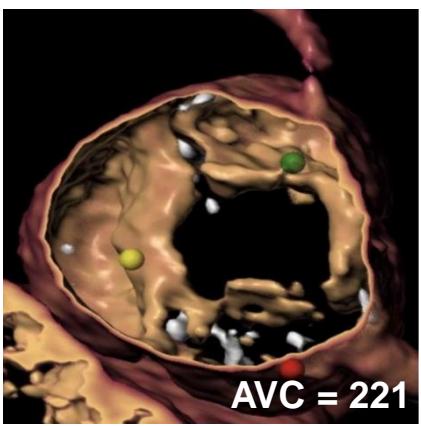
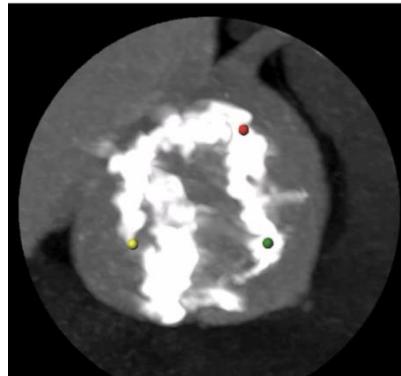
Low (<1200)



Intermediate (1201 – 6000)



High (>6000)



Baseline Characteristics

	Low AVC (n = 45) (mean±SD)	Intermediate AVC (n = 203) (mean±SD)	P Value
Age (years)	71.0 ± 8.7	72.5 ± 9.2	0.324
Female	37 (82.2%)	80 (39.4%)	0.03
BMI (kg/m ²)	28.9 [23.9 – 34.5]	28.3 [23.9 – 33.1]	0.748
eGFR (mL/min)	63.9 ± 24.5	68.8 ± 20.5	0.157
STS	3.20 [1.82 – 5.15]	3.90 [1.9 – 5.54]	<0.001
Diabetes (%)	17 (37.8%)	61 (30.0%)	0.312
Hypertension (%)	36 (80.0%)	176 (86.7%)	0.248

Baseline Characteristics

	Low AVC (n = 45) (mean±SD)	Intermediate AVC (n = 203) (mean±SD)	P Value
Dyslipidemia (%)	24 (53.3%)	133 (64.9%)	0.147
CAD (%)	21 (46.7%)	98 (82.4%)	0.890
COPD (moderate to severe, %)	2 (4.5%)	24 (11.9%)	0.185
Atrial Fibrillation (%)	11 (24.4%)	49 (23.9%)	0.894
Prior Pacemaker (%)	4 (8.9%)	14 (6.8%)	0.541

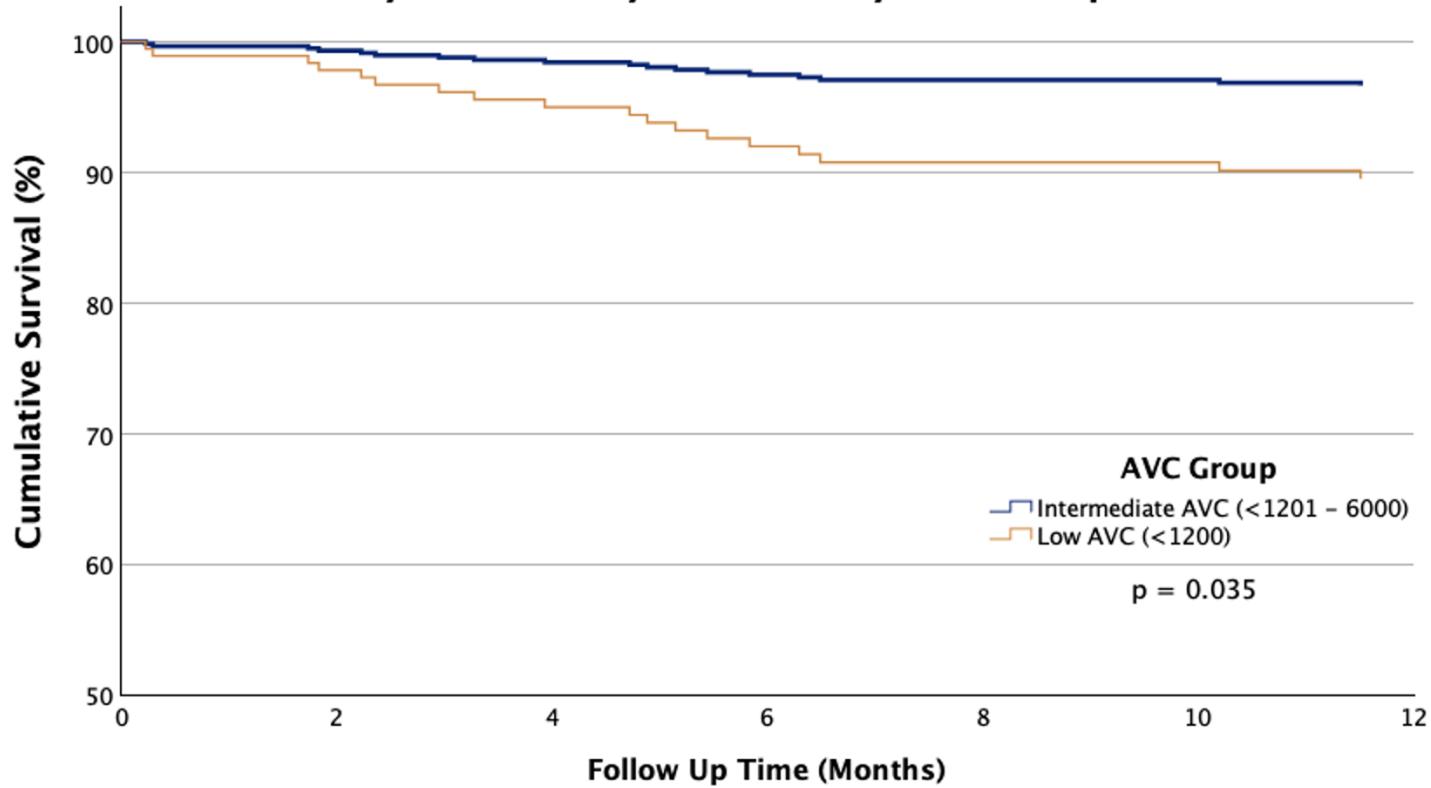
Baseline Demographics – Highlights

- More females (> 82%) in the low AVC group
- Lower STS PROM score in the low AVC group

Outcomes

	Low AVC (n = 45)	Intermediate AVC (n = 203)	P Value
Median Follow Up (months)	46.2 [19.8 – 59.3]	41.6 [22.1 – 70.0]	0.93
All-Cause Mortality	13 (28.9%)	55 (26.8%)	0.91
Mortality (1-year)	6 (13.3)	12 (5.9%)	0.035
Stroke (1-year)	0 (0%)	8 (3.9%)	0.206
MACE (1-year)	8 (9.8%)	20 (17.8%)	0.122

1-year Mortality Stratified by AVC Group



Outcomes

- **Independent predictors of 1-year mortality:**
 - **Low AVC:** HR 3.12 (95% CI: 1.11–8.85, p=0.035)
 - **Female sex:** HR 0.30 (p=0.025)
 - **Higher BMI:** HR 0.88 (p=0.011)
 - **Higher STS score:** HR 1.25 (p=0.002)

Discussion

- Low calcium burden likely reflects **fibrotic or under-mineralized BAV phenotype** associated with **greater leaflet stiffness** and **underlying myocardial disease**.
- Less calcified severe AS also indicates poor metabolic status (e.g. osteoporosis), which can also translate into poor outcomes.
- Suggests not all “less-calcified” valves are benign.

Conclusions

- **AVC quantification** should not be interpreted linearly (low ≠ good).
- AVC burden, **both *extremely high* and *low***, should be incorporated into pre-TAVR evaluation and clinical decision-making.
- Future research: link low AVC with **fibrosis, valve morphology, and LV remodeling**.

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