

TAVR in Bicuspid Aortic Stenosis with Severe Calcification: Case Review and Tips-and-Tricks

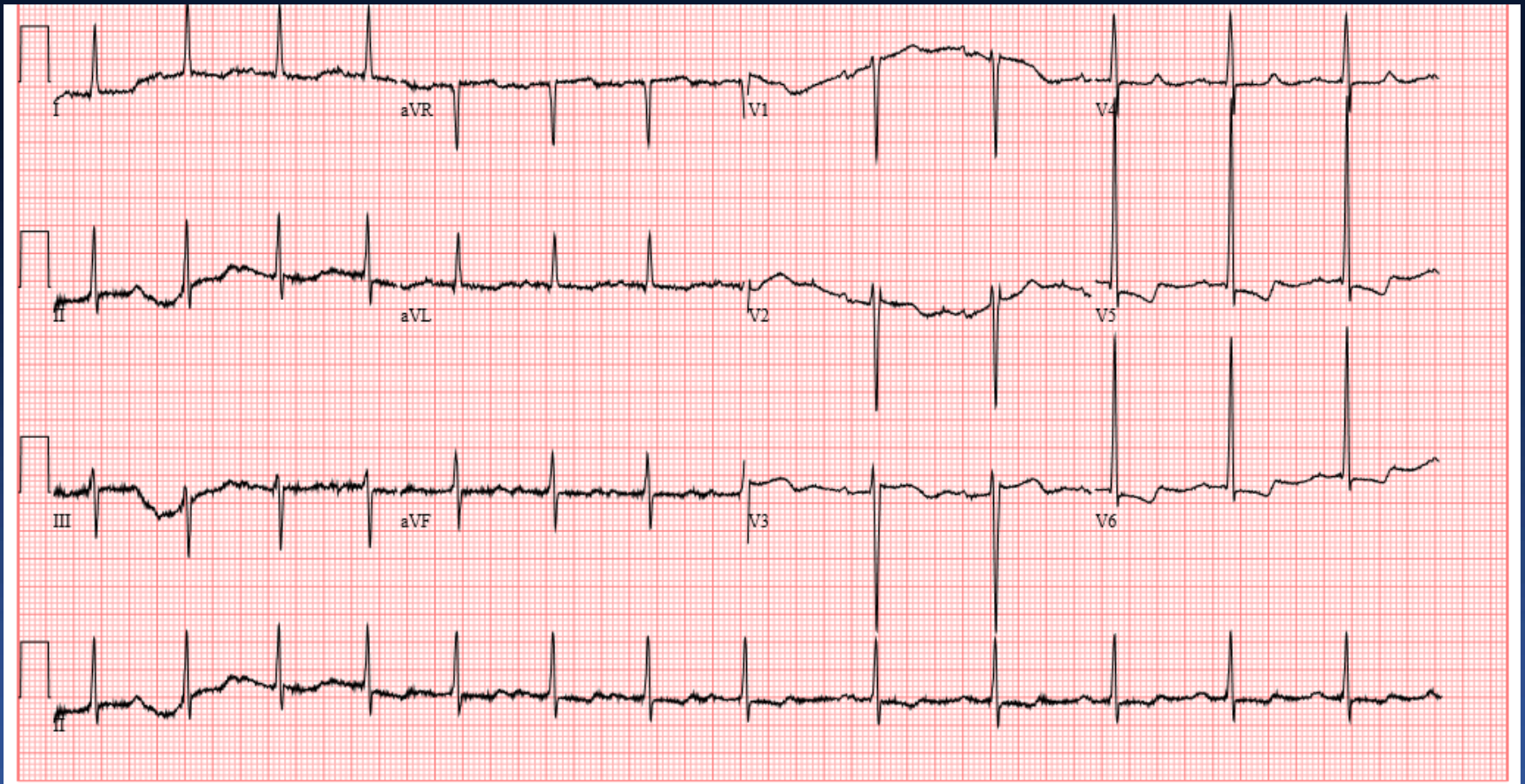
Jung-Min Ahn, MD

Heart Institute, University of Ulsan College of Medicine
Asan Medical Center, Seoul, Korea

Case

- 81 YO Female
- CC: DOE(NYHA Fc III) and Chest discomfort for 7 months
- Medical history: None
- STS score: 2.913%
- Euroscore I = 11.59%, Euroscore II = 2.01%

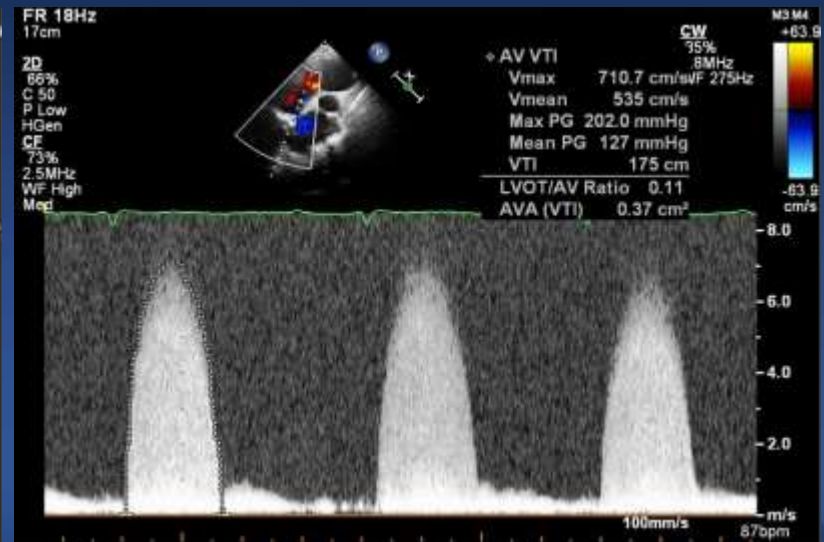
ECG



Chest PA



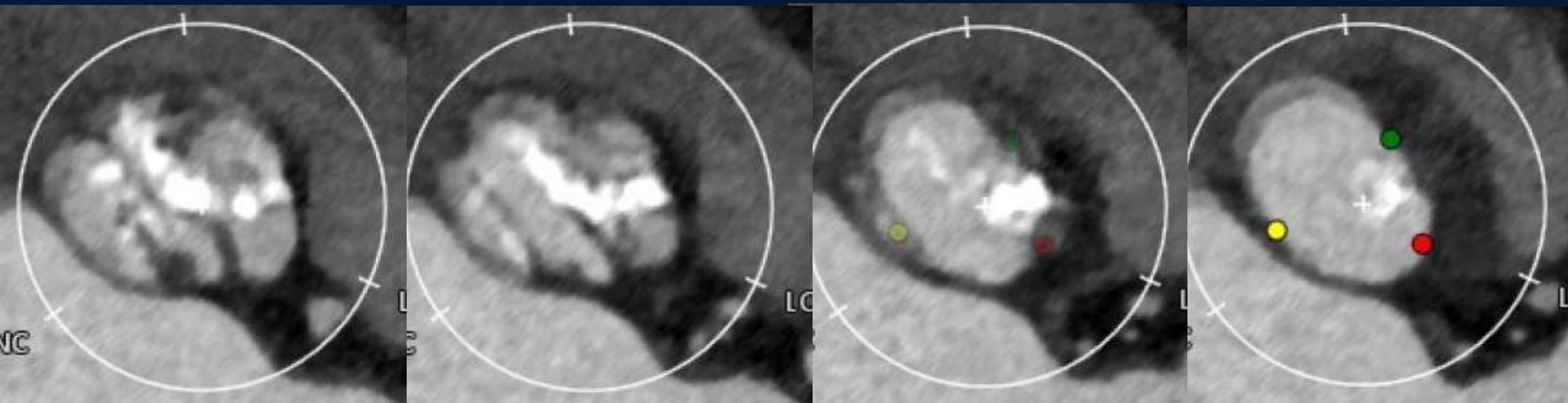
Echocardiography



Echocardiography

- Degenerative aortic valve
- AVA = 0.37 cm²
- Peak / Mean PG = 202 / 127 mm Hg
- V max = 7.1 m/s
- EF= 39 %
- LVOT diameter, TTE: 20.8 mm
- Moderate MR, trivial TR
- Very severe degenerative AS
- Concentric LVH with moderate LV dysfunction

CT findings – Aortic annulus view



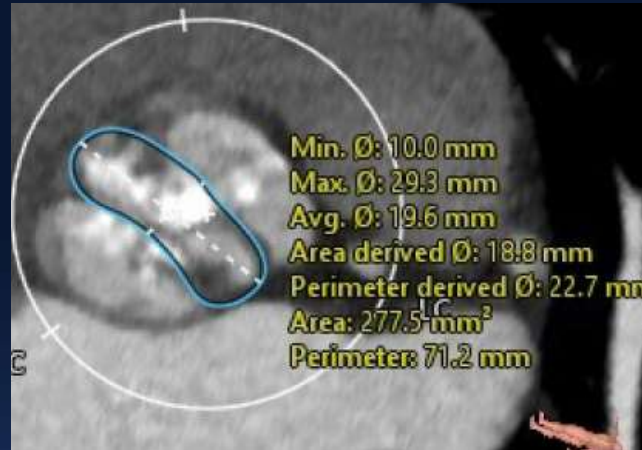
Annulus plane

Aortic Annulus parameters	
Annulus short diameter	19.5 mm
Annulus long diameter	28.5 mm
Annulus mean diameter	24.0 mm
Annulus area	441 mm ²
Annulus area-driven diameter	23.7 mm
Annulus perimeter	76.6 mm
Annulus perimeter-driven diameter	24.4 mm

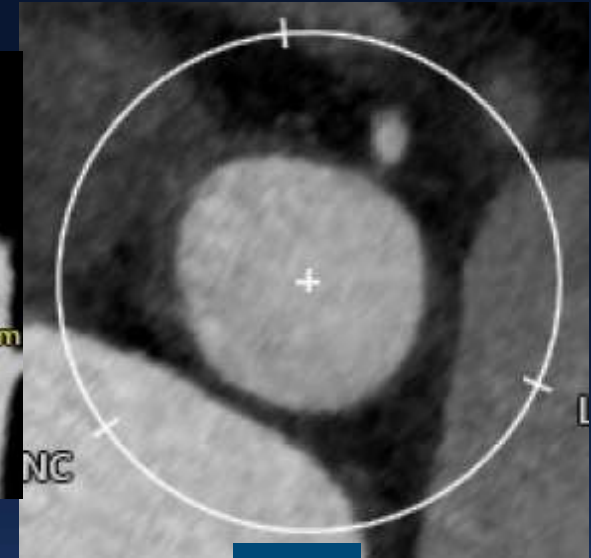
CT findings – Aortic Valve Complex



Sinus of Valsalva



Supra-annulus



STJ

Sinus of Valsalva		STJ	
Area	644 mm²	Area	478 mm²
Sinus / Annulus Area Ratio	1.46	STJ/ Annulus Area Ratio	1.09
Long diameter	31.7 mm	Mean diameter	26.5 mm
Short diameter	23.5 mm		
Supra-annular area	278 mm²		
Supra-annular long diameter	29.3mm		

Mean Sinus / Annulus Area Ratio

1.83 ± 0.27

Mean STJ / Annulus Area Ratio

1.49 ± 0.29

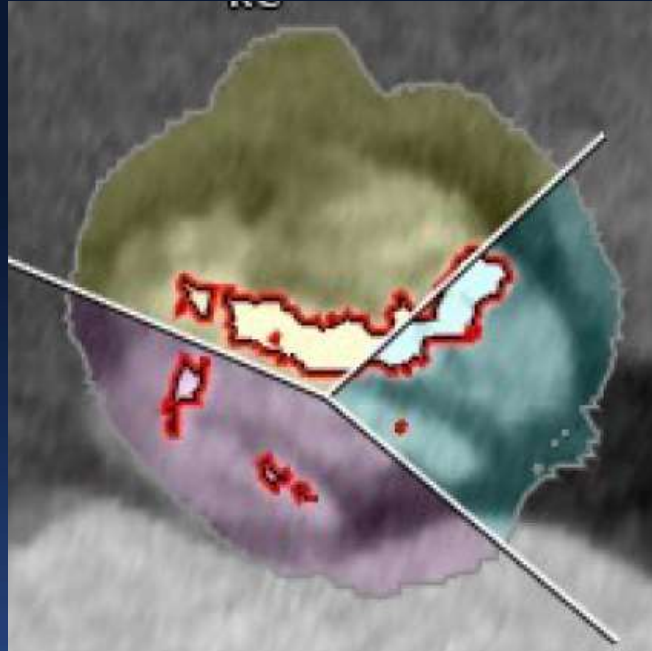
CT findings – Aortic Valve Complex



LVOT

LVOT	
Area	477 mm ²
LVOT / Annulus Area Ratio	1.08
Short diameter	19.2 mm
Long diameter	30.0 mm

CT findings – Aortic Valve Complex



Calcified Raphe

Calcium volume	
NCC	47 mm ³
R-LCC	398 mm ³
Total	445 mm ³

CT findings – Coronary Height

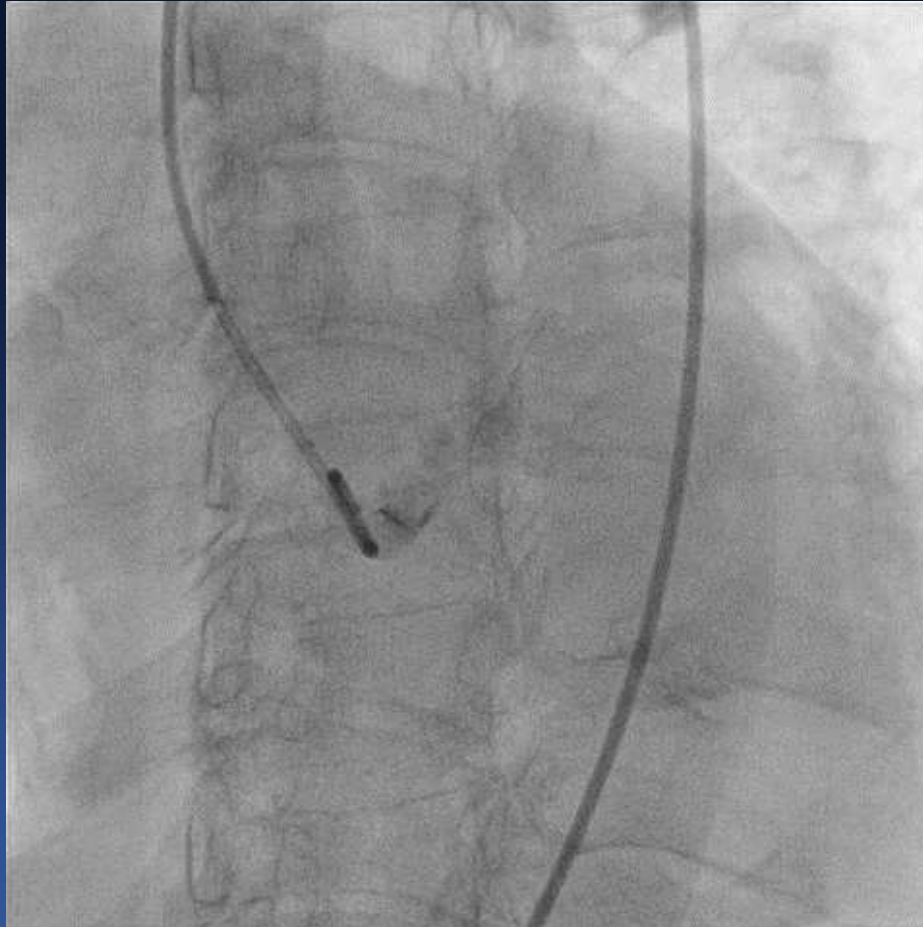


Coronary Height	
LCA	9.8 mm
RCA	14.5 mm

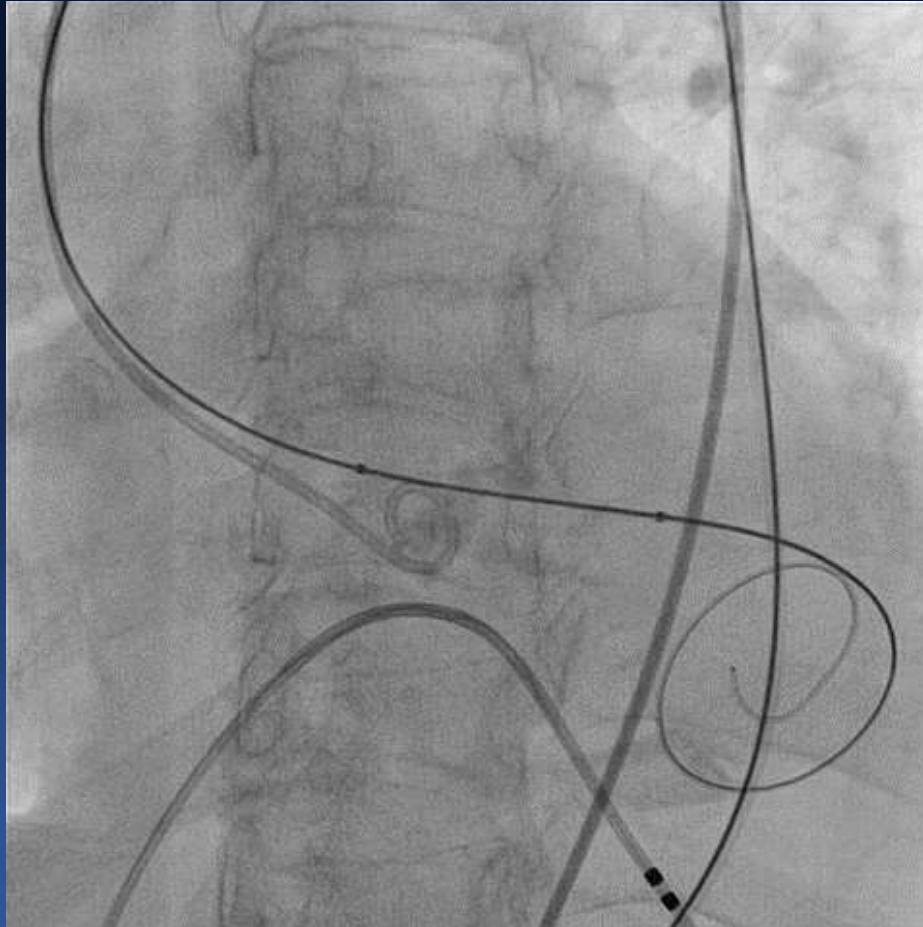
Evolut R 29 mm



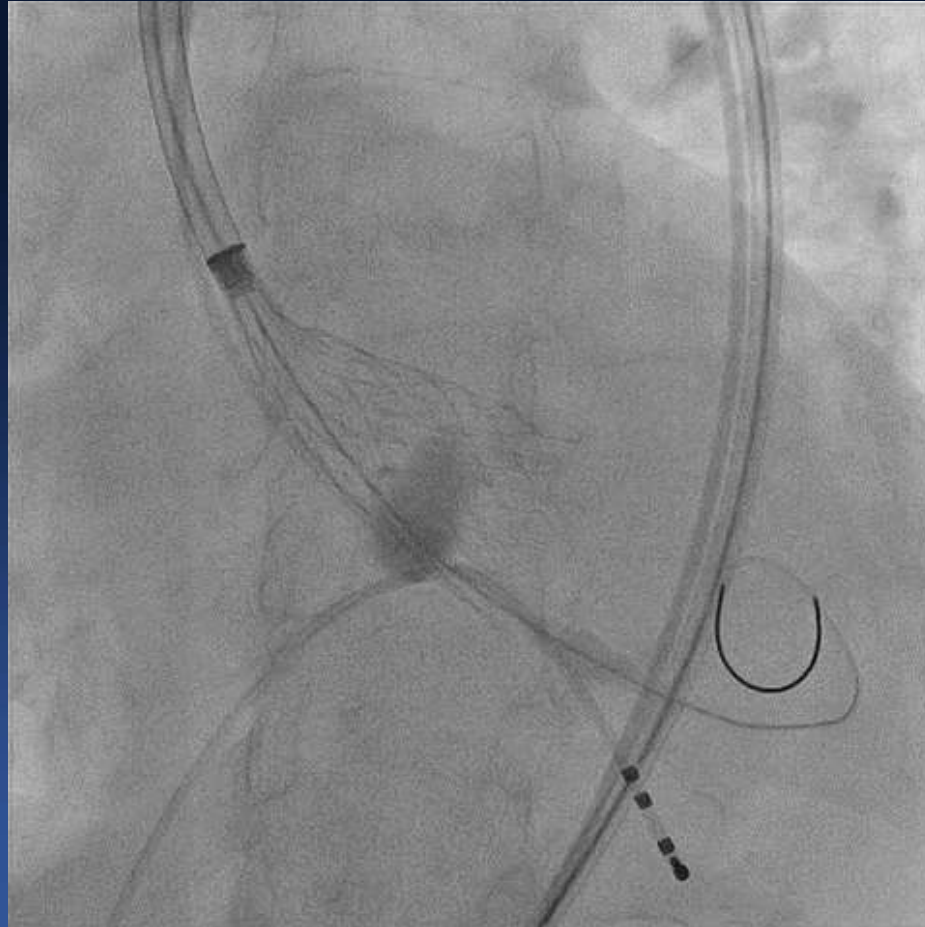
Aortogram



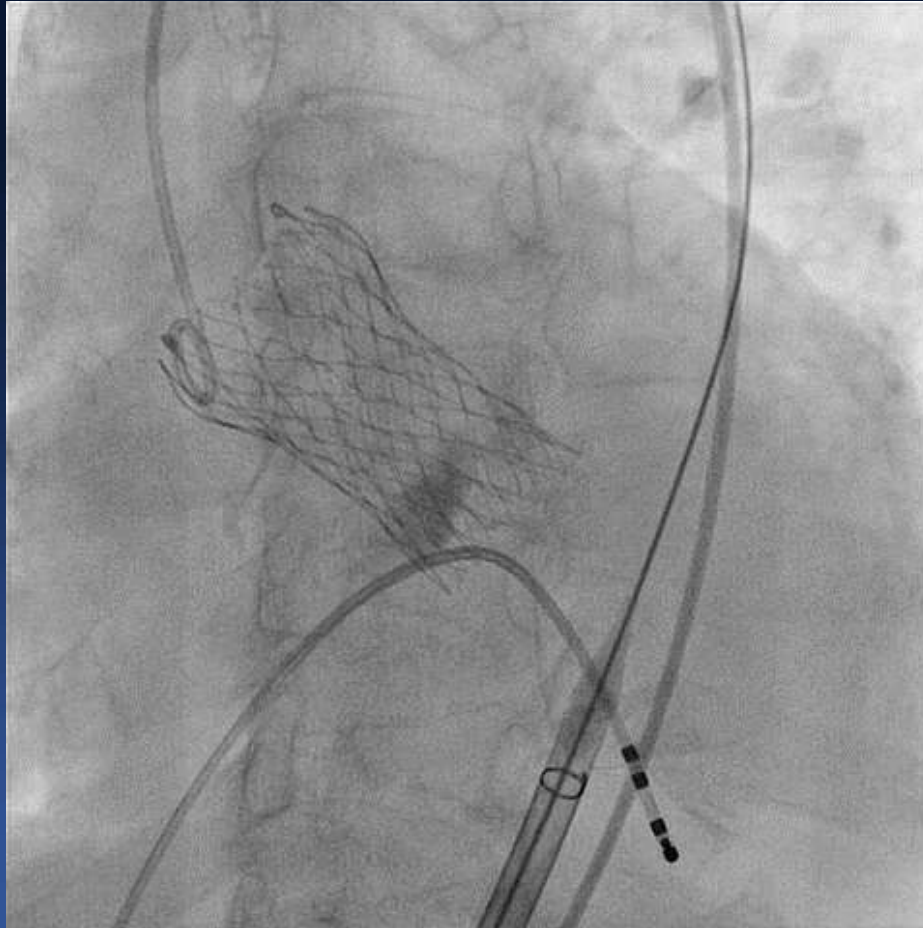
BAV (20mm)



Device Implantation

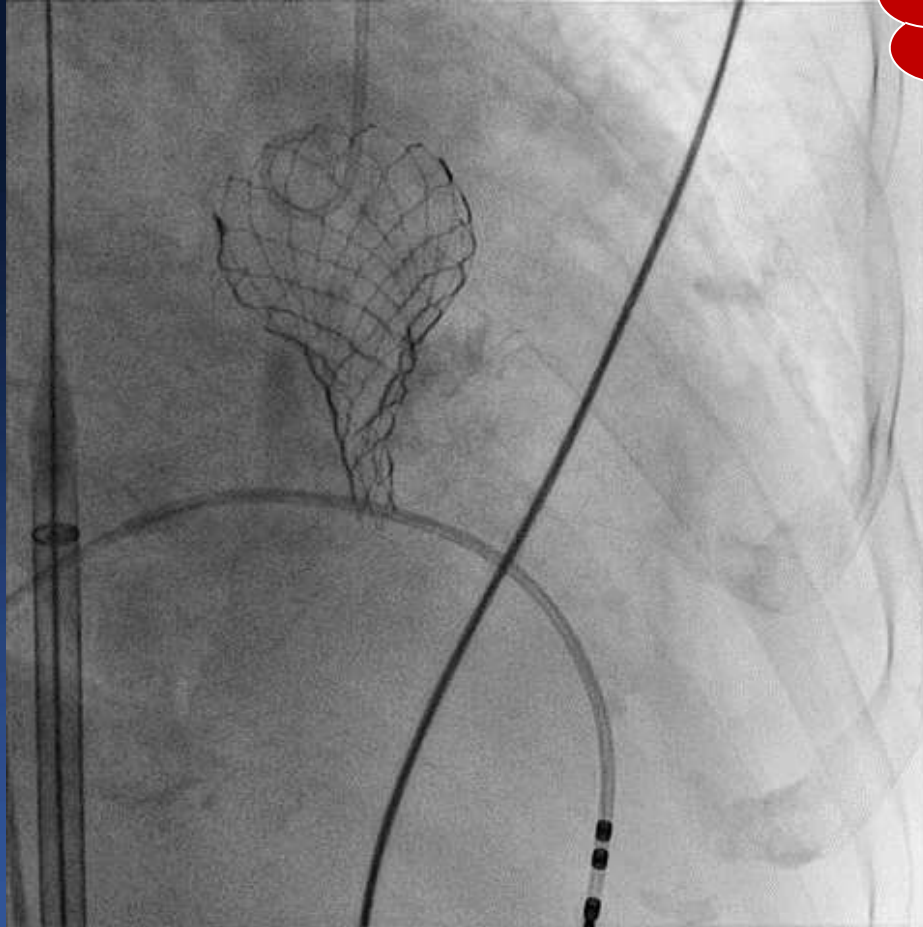


Post-Implantation



RAO Projection

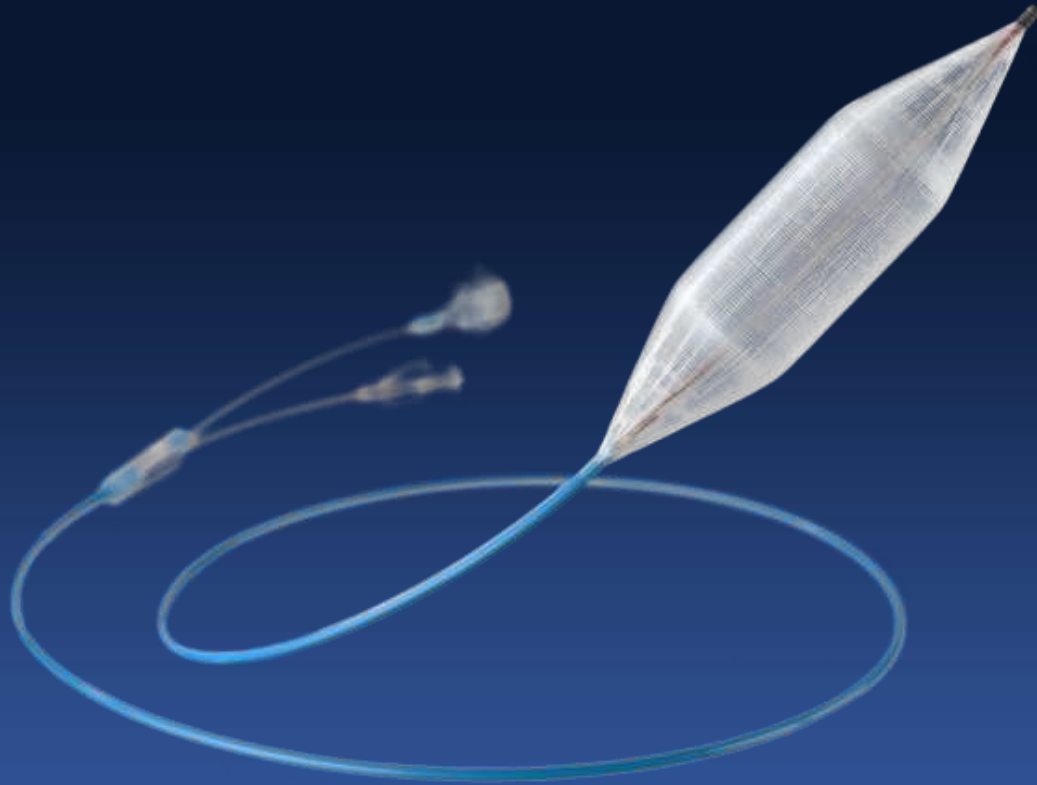
Oh, no



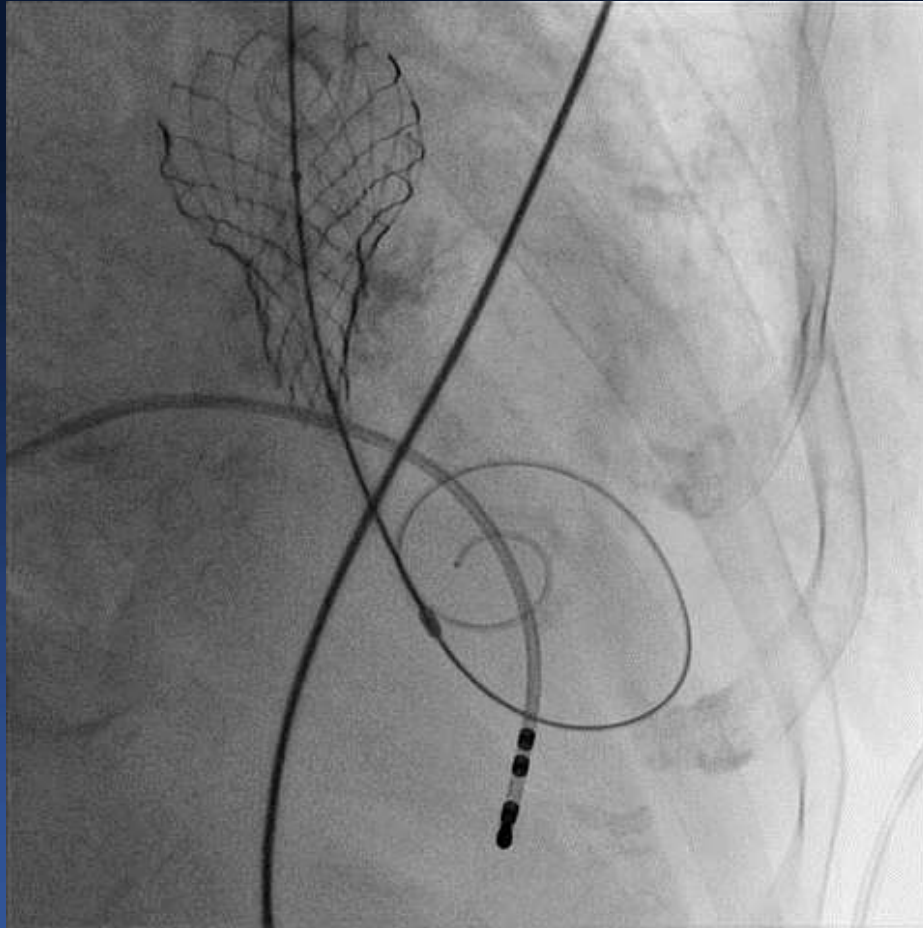
Pressure Tracing



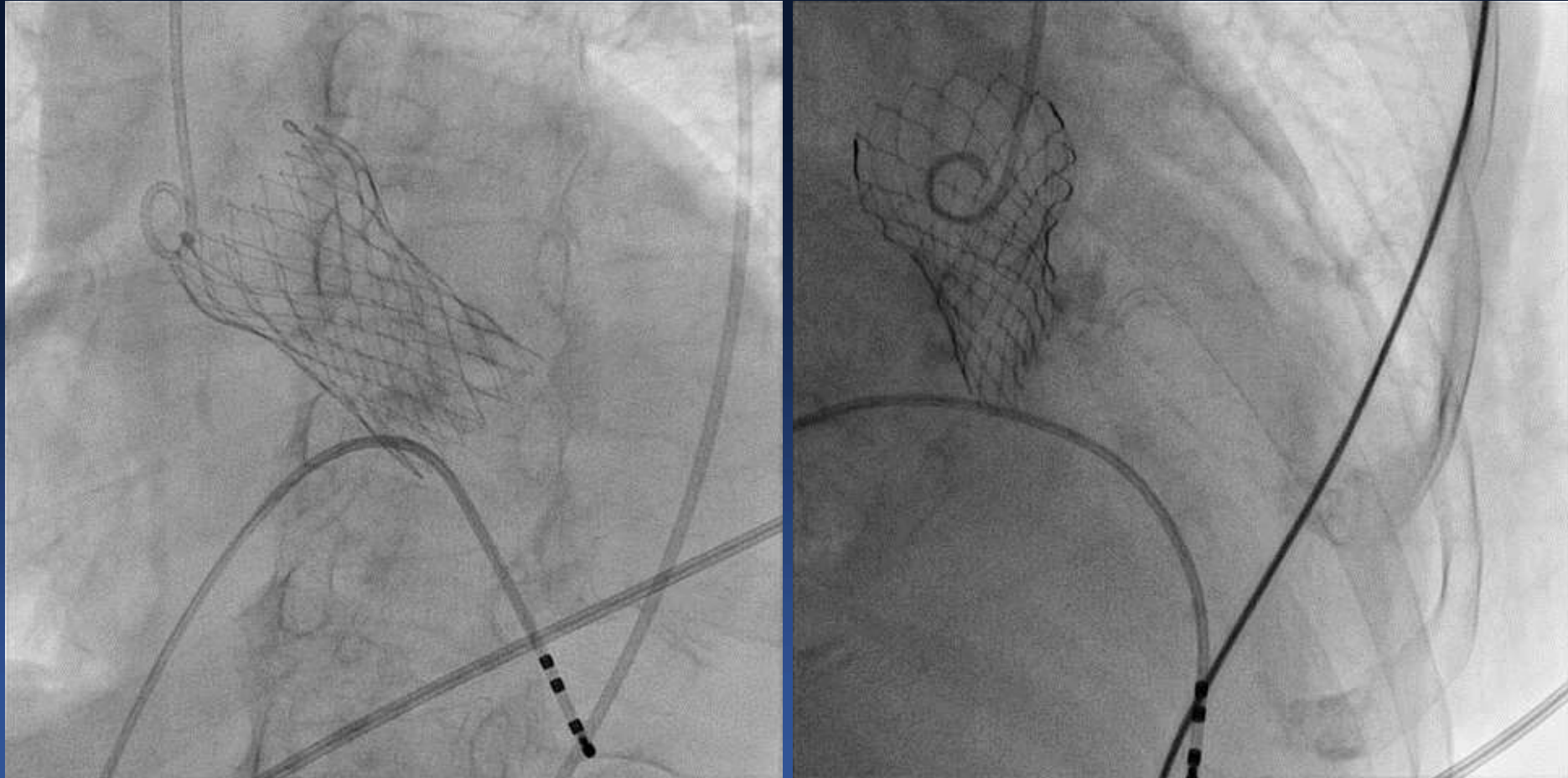
ATLAS[®] PTA Dilatation Catheter (20 mm x 4 cm)



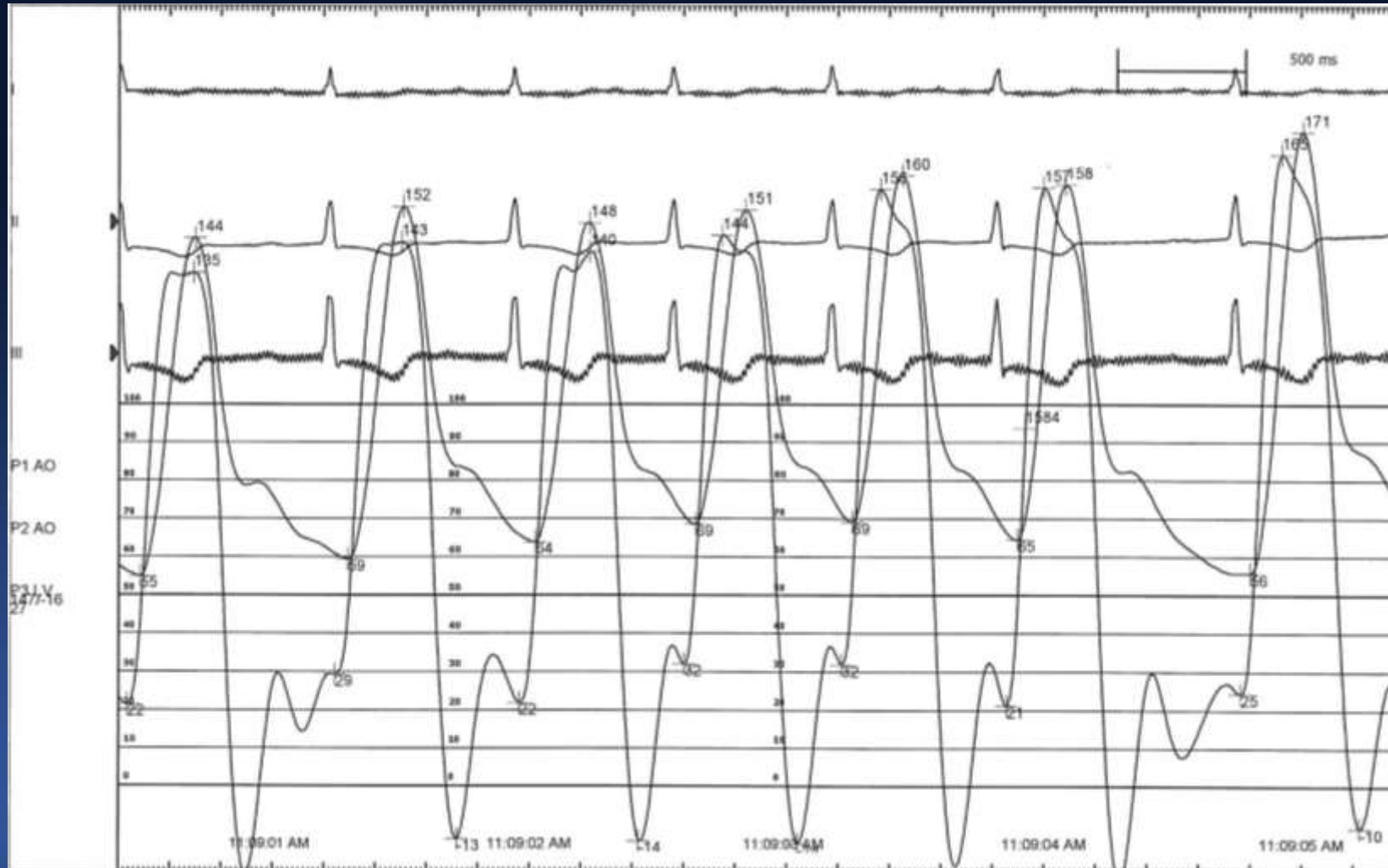
Post-Ballooning



Final Aortogram



Final Pressure Tracing



Summary

- TAVR for bicuspid AV remains challenging.
- Balloon valvuloplasty before valve implantation for sizing and premodification is generally recommended.
- In our case, despite the balloon valvuloplasty, additional postdilatation was necessary for a poorly expanded device and residual pressure gradient.
- When a noncompliant balloon is used, it is possible to expect appropriate valve expansion while minimizing the risk of root injury by uniform and predictable force transmission.
- In addition, multiple projection is very important to detect the asymmetric device underexpansion in bicuspid AS.