

Left Main Protection during TAVR

Raj R. Makkar, MD

**Director, Interventional Cardiology & Cardiac
Catheterization Laboratories**

Cedars-Sinai Medical Center, Los Angeles

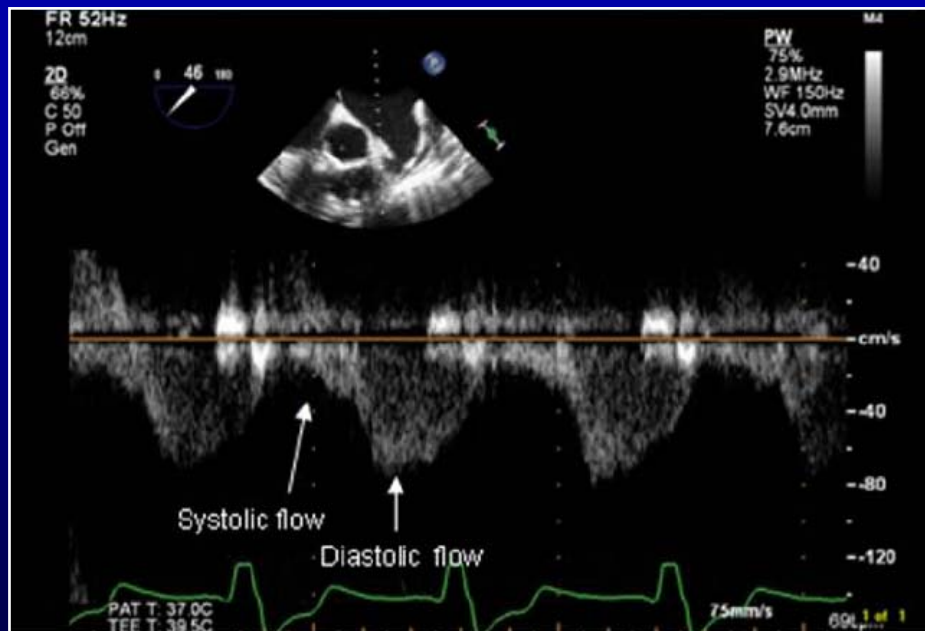
Associate Director, Cedars-Sinai Heart Institute

Effects of Percutaneous Aortic Valve Replacement on Coronary Blood Flow Assessed With Transesophageal Doppler Echocardiography in Patients With Severe Aortic Stenosis

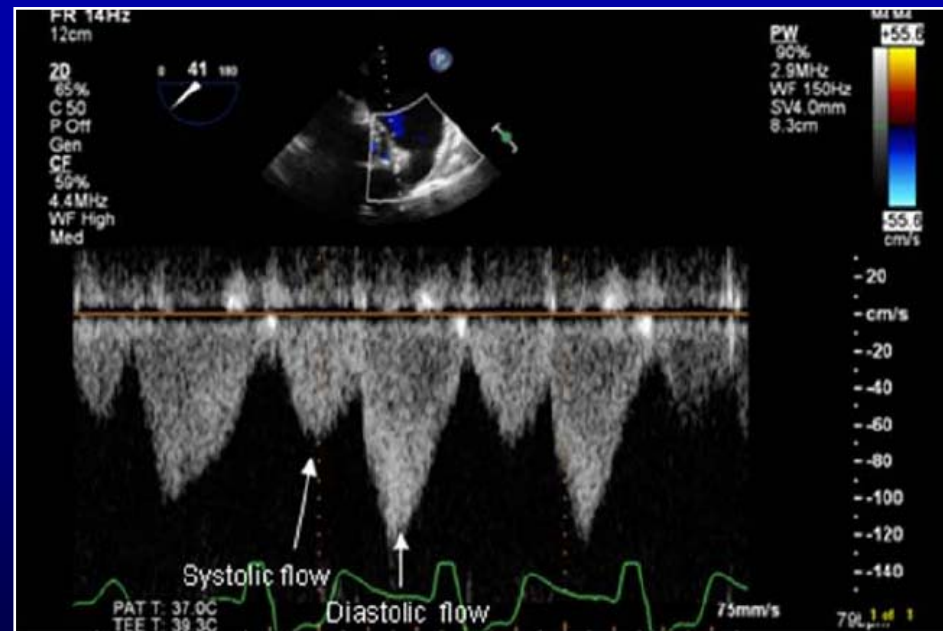
Itsik Ben-Dor, MD, Steven A. Goldstein, MD, Ron Waksman, MD*, Lowell F. Satler, MD, Yanlin Li, MD, Asmir I. Syed, MD, Gabriel Maluenda, MD, Sara D. Collins, MD, William O. Suddath, MD, Rebecca Torguson, MPH, Zhenyi Xue, MS, Kimberly Kaneshige, BS, Petros Okubagzi, MD, Zuyue Wang, MD, Kenneth M. Kent, MD, PhD, and Augusto D. Pichard, MD

Improvement in Left Main Coronary Artery Flow after TAVI

Coronary Flow Before PAVI

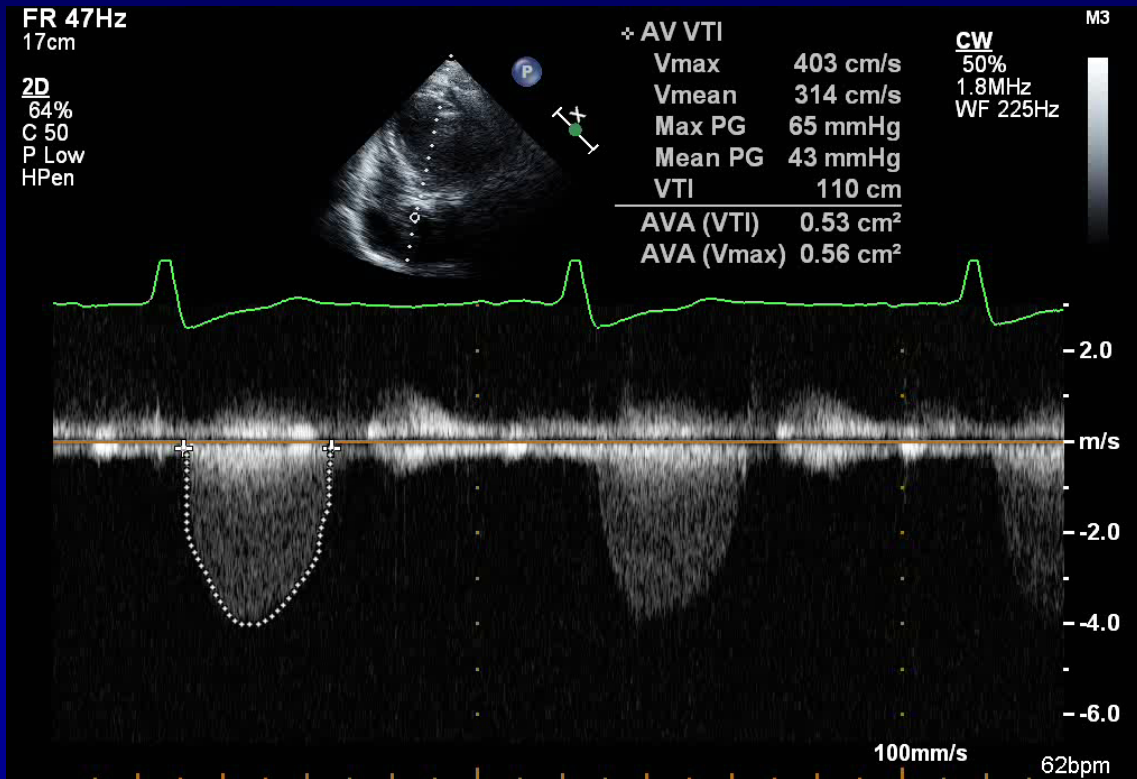


Coronary Flow After PAVI



Ben-Dor et al. American Journal of Cardiology 2009

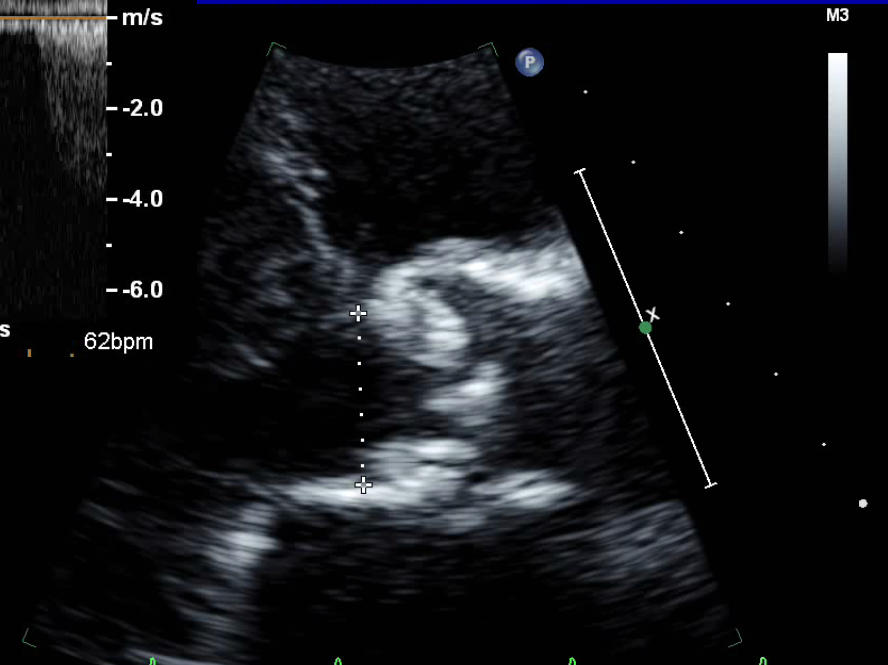
88 y/o female with STS Score 12.2



- AVA = 0.53 cm²
- Mean gradient = 43 mmHg
- Peak gradient = 65 mmHg
- EF = 45%
- Annulus = 19 mm
- Mild AR/PR/TR
- Moderate MR

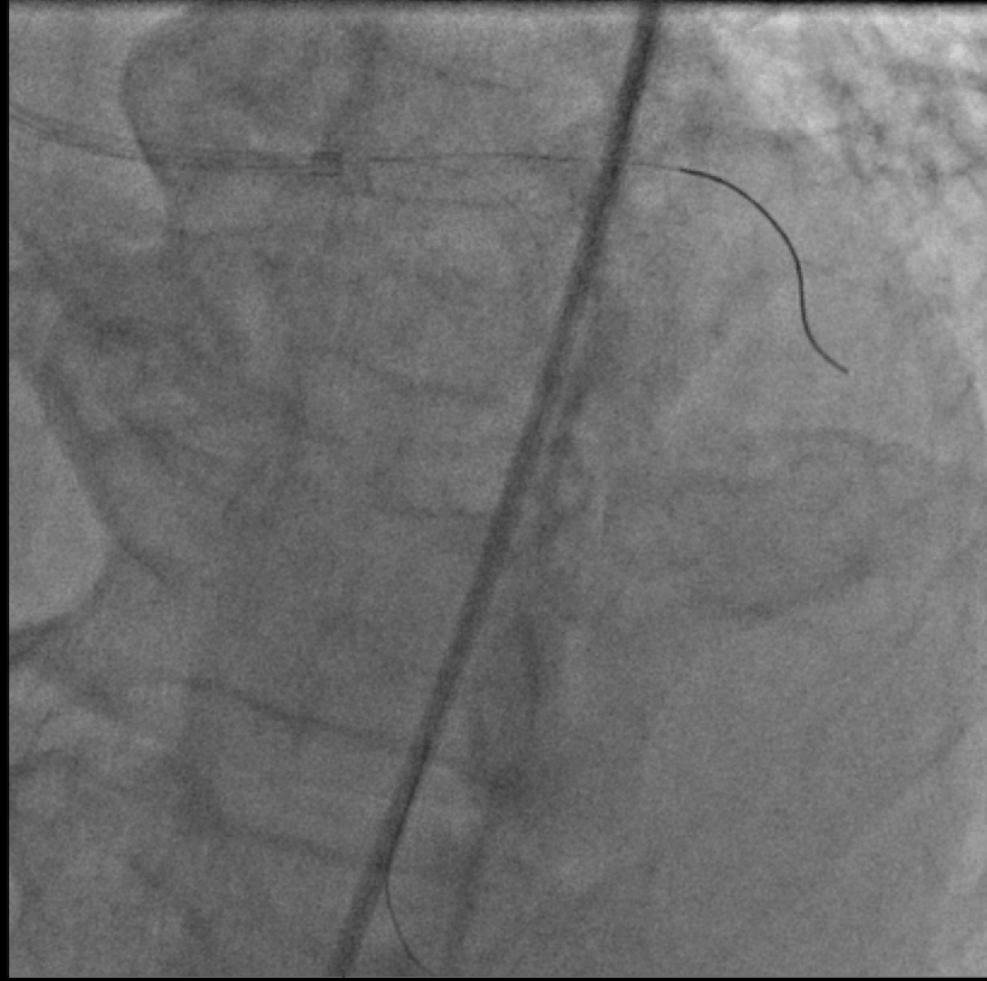


LVOT Diam 2.0 cm
LVOT Area 3.14 cm²



Ostial Left Main Stenosis

Lossy Compression - not intended for diagnosis



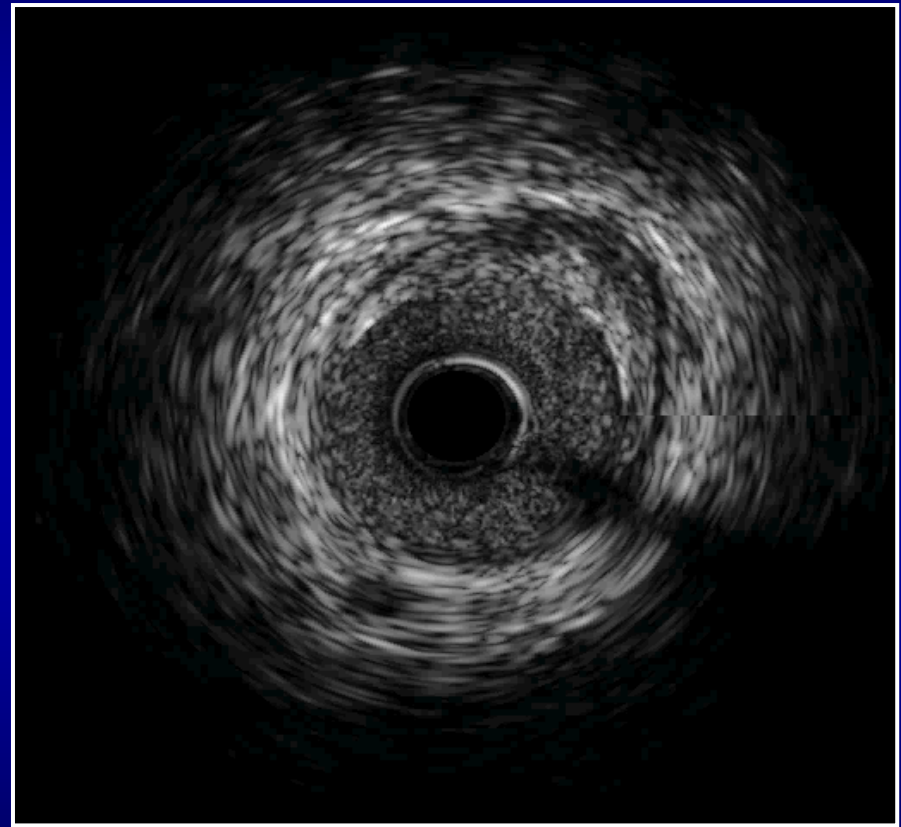
Key Questions posed by this case:

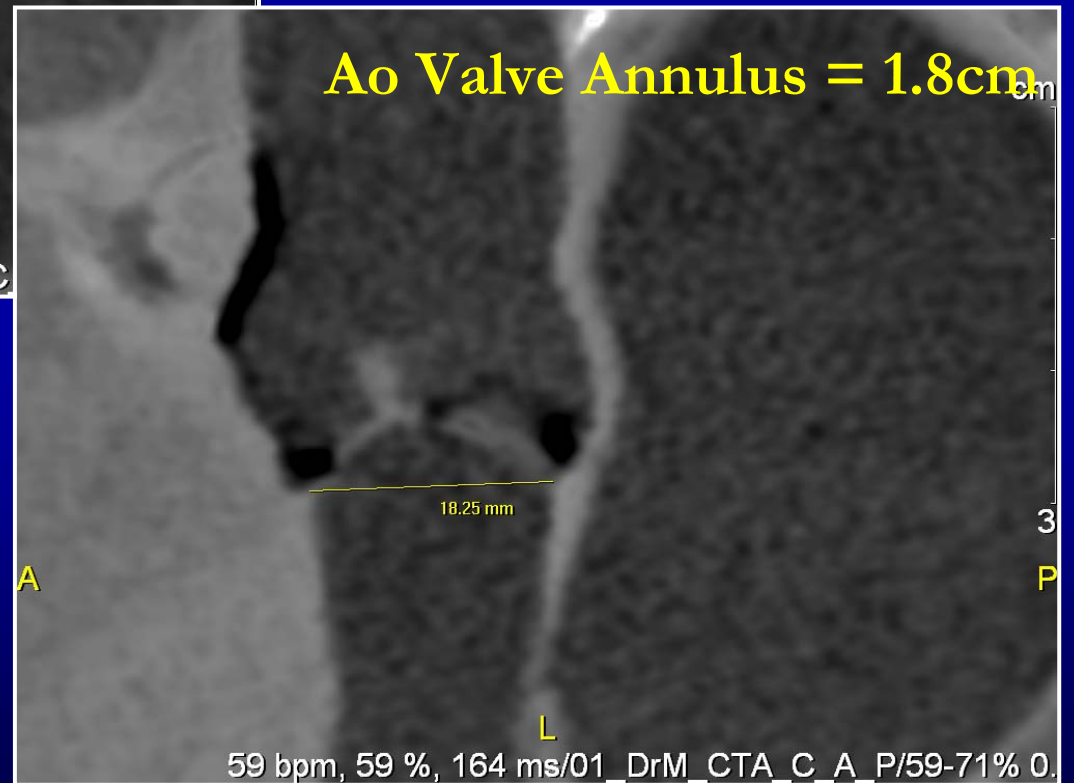
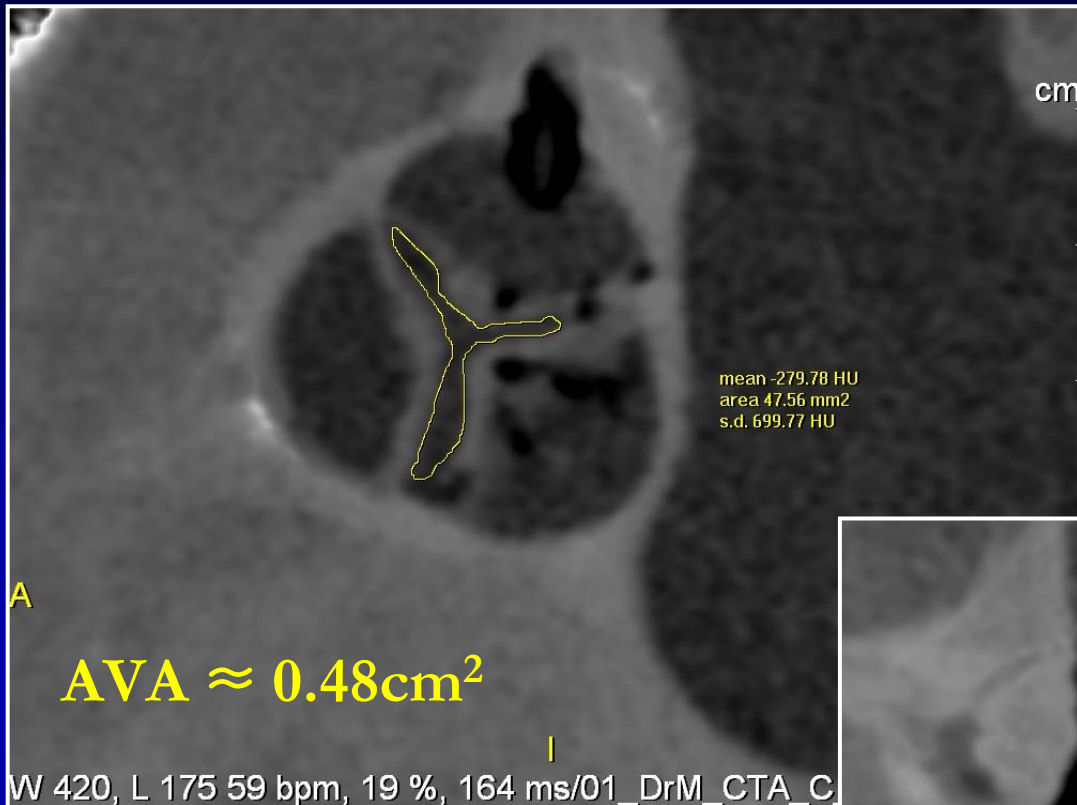
- Should this patient undergo TAVI?
- Is one device better than the other?
- Should the two procedures be staged?
- Left Main Stent or TAVI first?
- Left Left Main PCI be modified in anticipation of TAVI?

LM Intervention

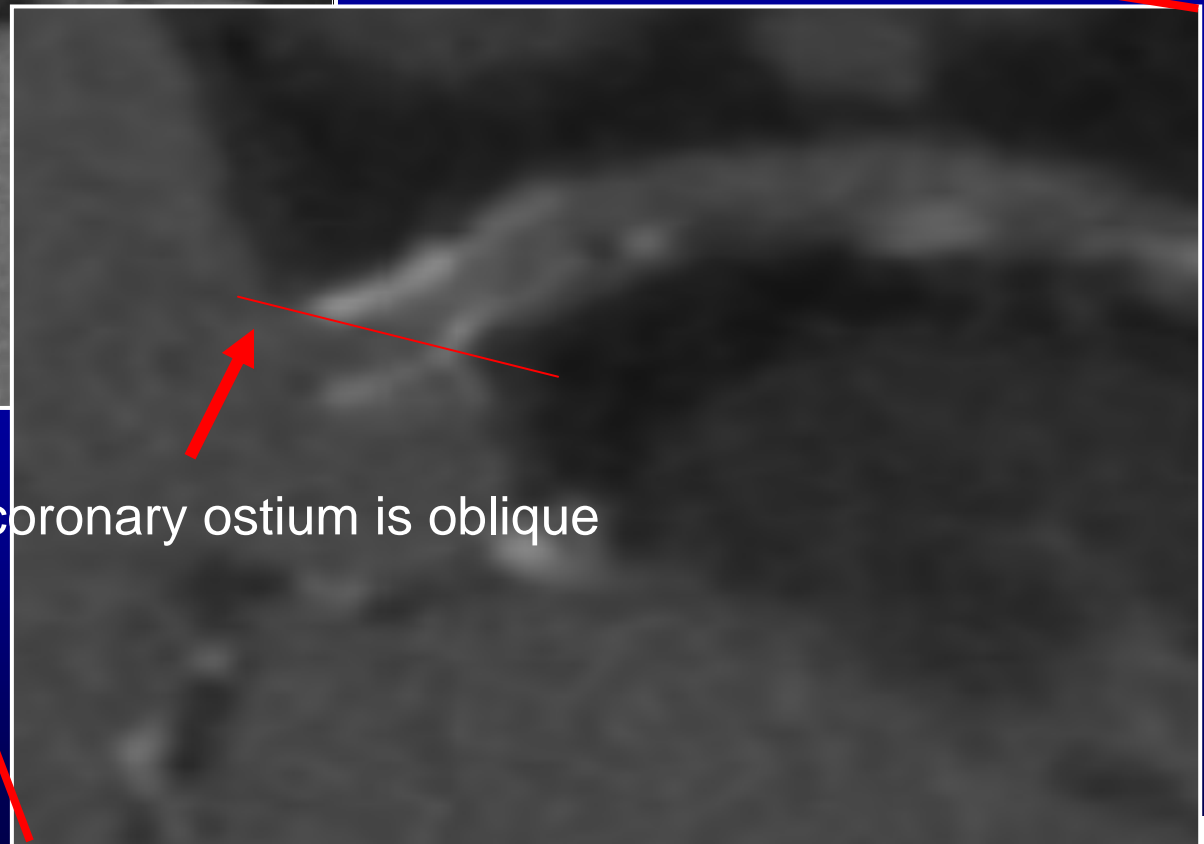


s/p Left Main Stenting

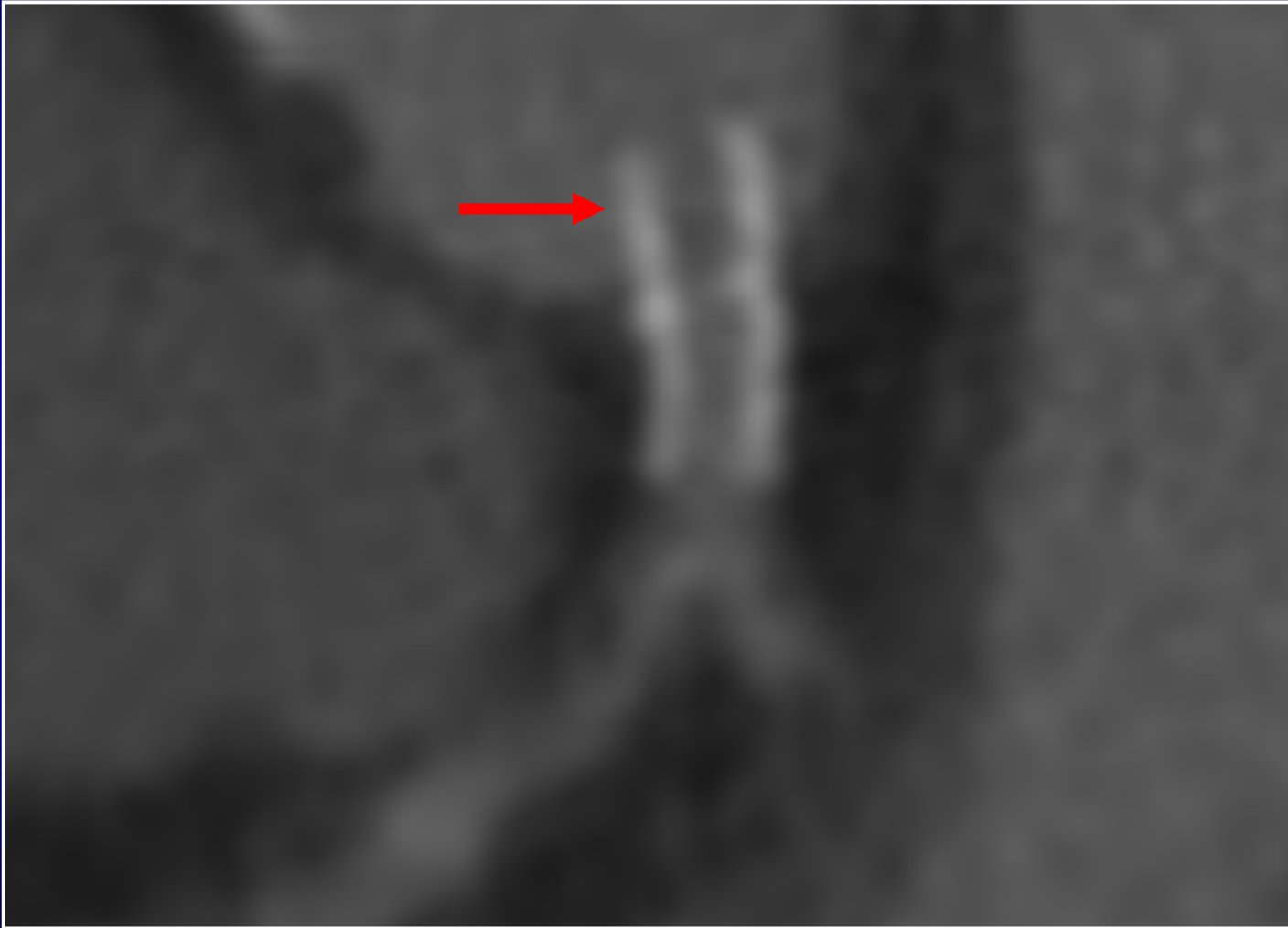




Left Main Stent Projecting into the Aorta



Plane of the coronary ostium is oblique

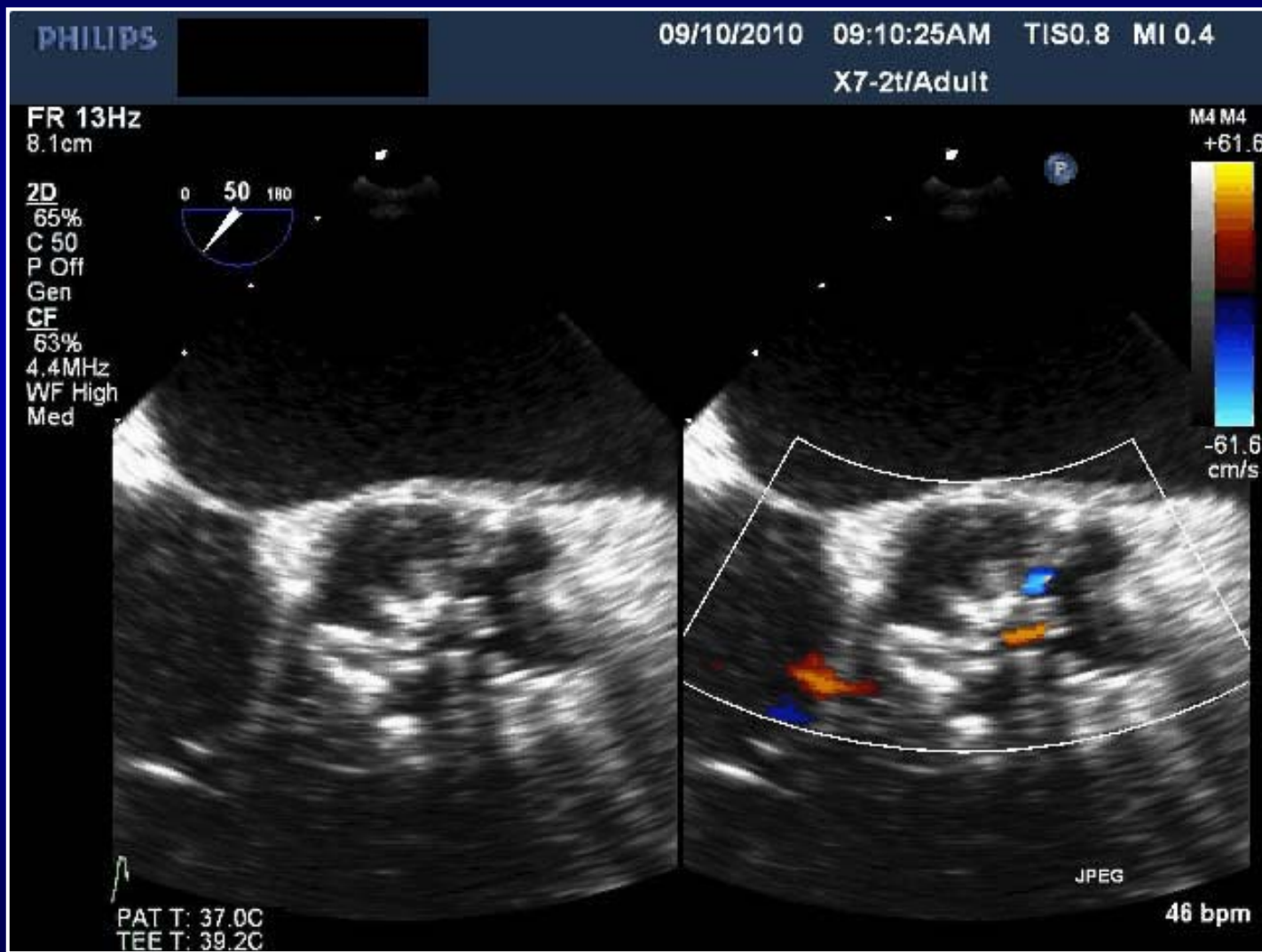


Periprocedural TEE

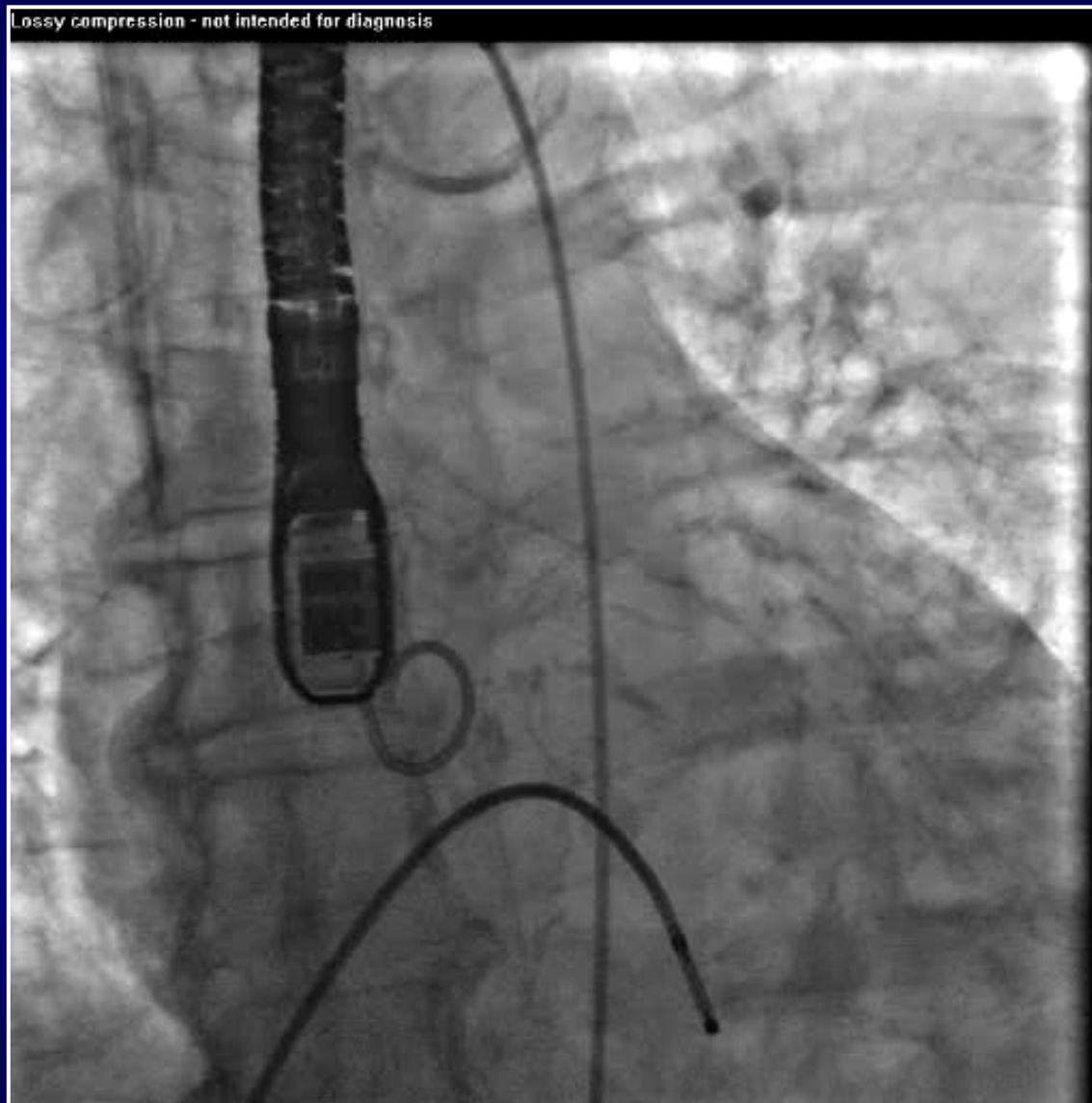


Left Main Stent

Periprocedural TEE



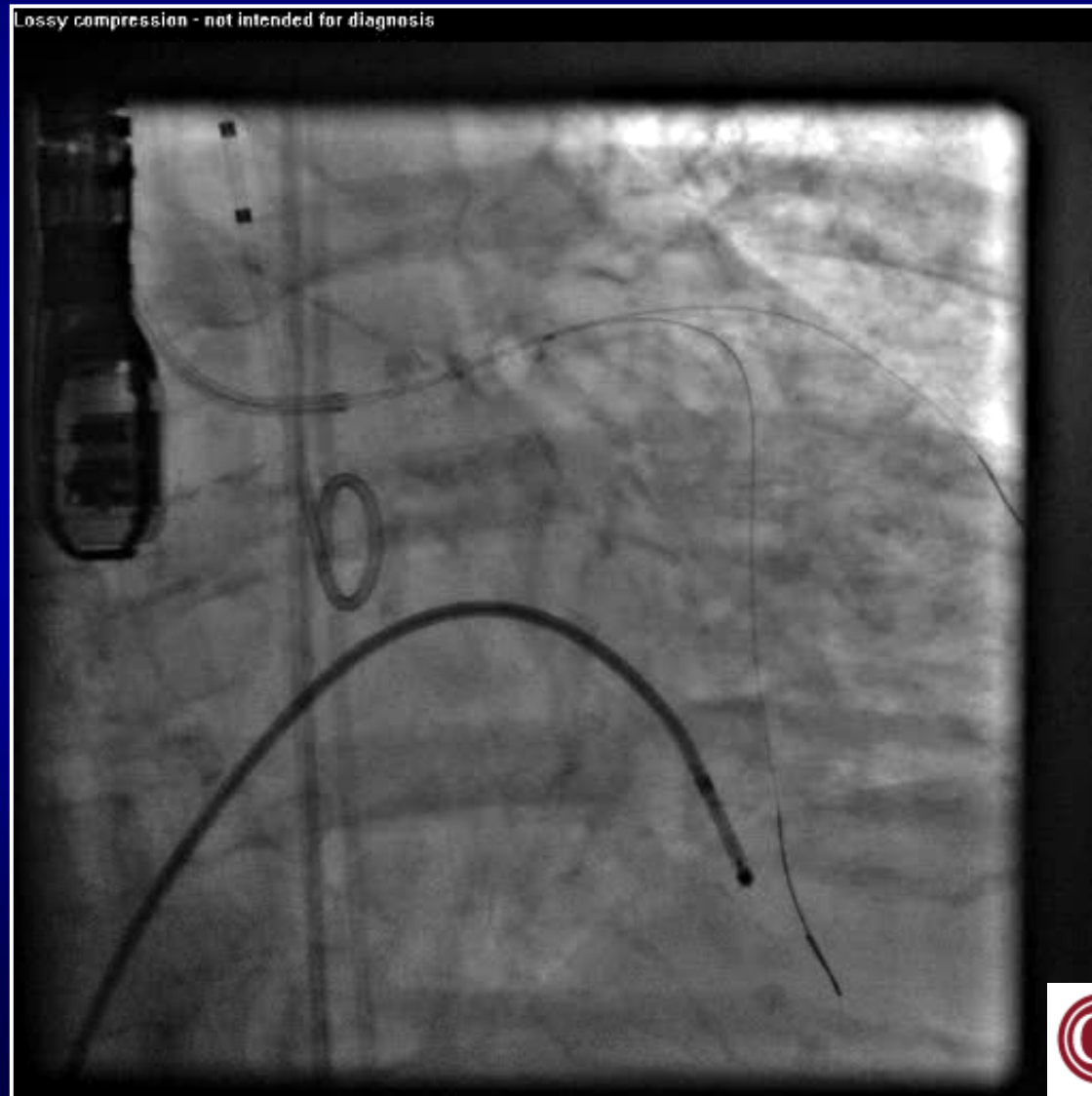
Aortic Valve Anatomy



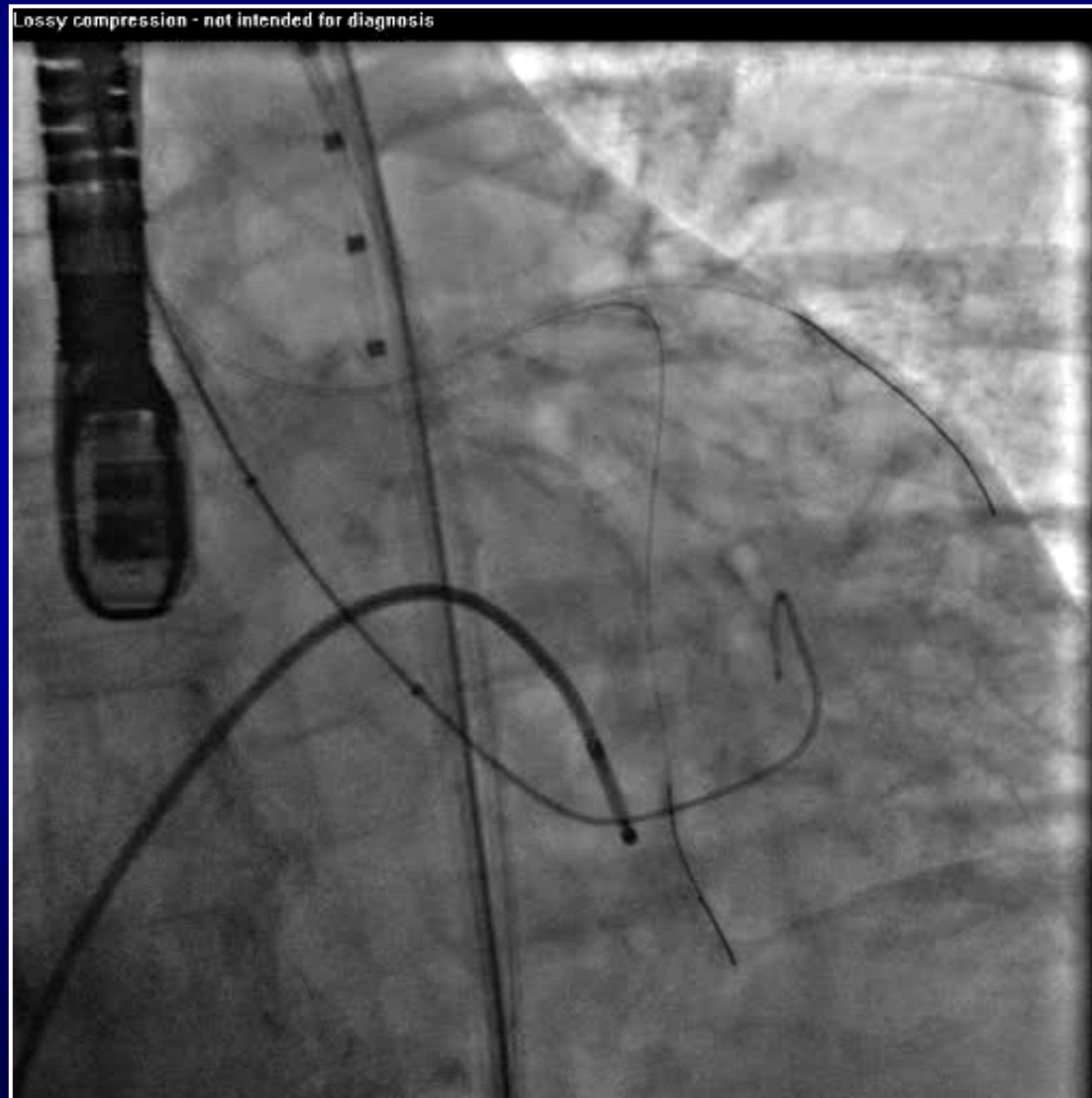
LM Protection: 2 guide wires to get adequate support of the guide



PTCA balloon advanced through the Left Main Stent to test that the wires are really through the lumen and not the struts

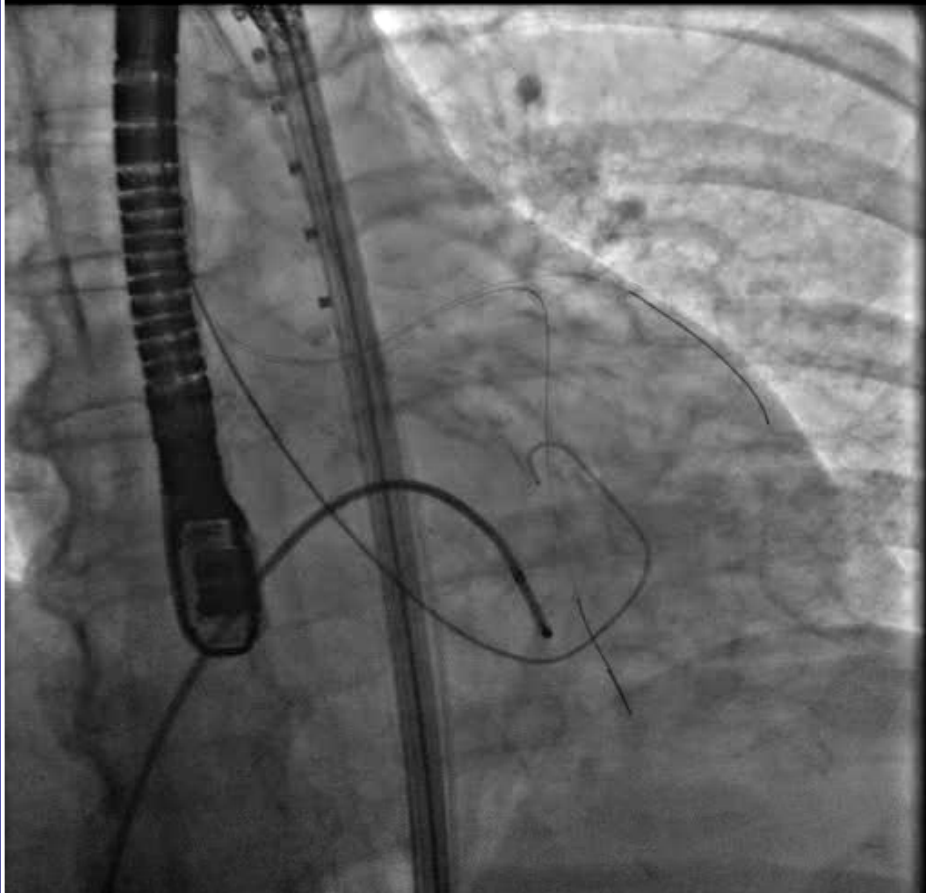


Short balloon: 20mmx3cm instead of 20mmx5cm to minimize trauma to protruding stent

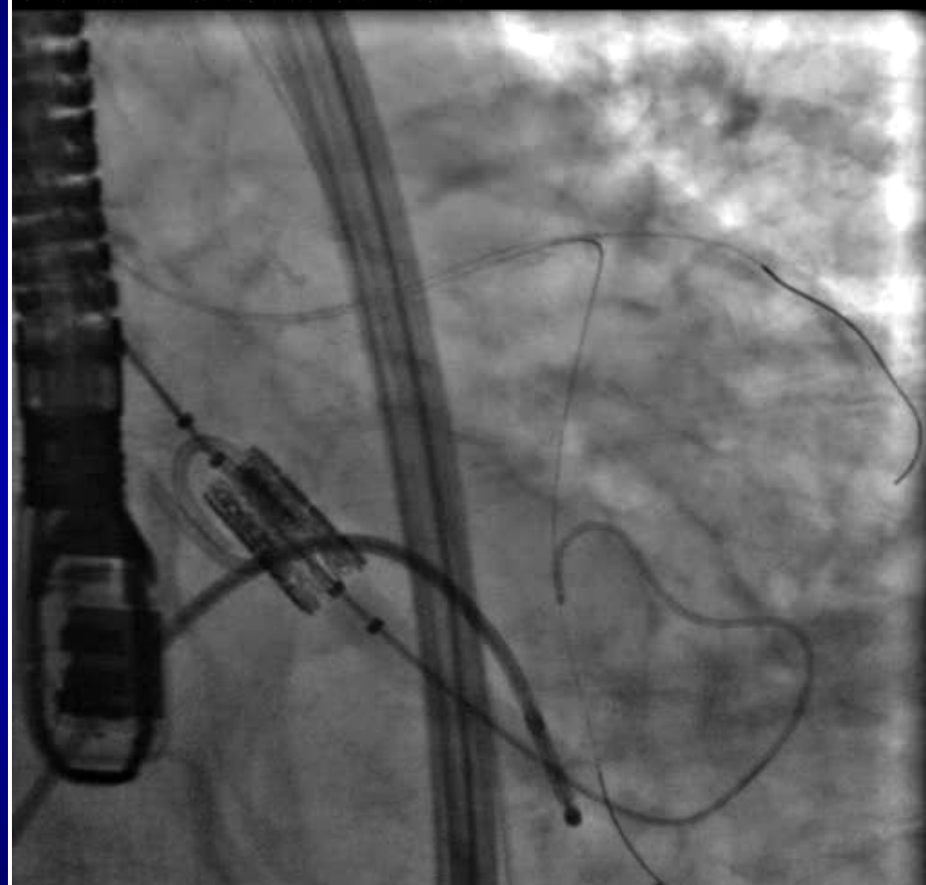


Valve Positioning

Lossy compression - not intended for diagnosis



Lossy compression - not intended for diagnosis

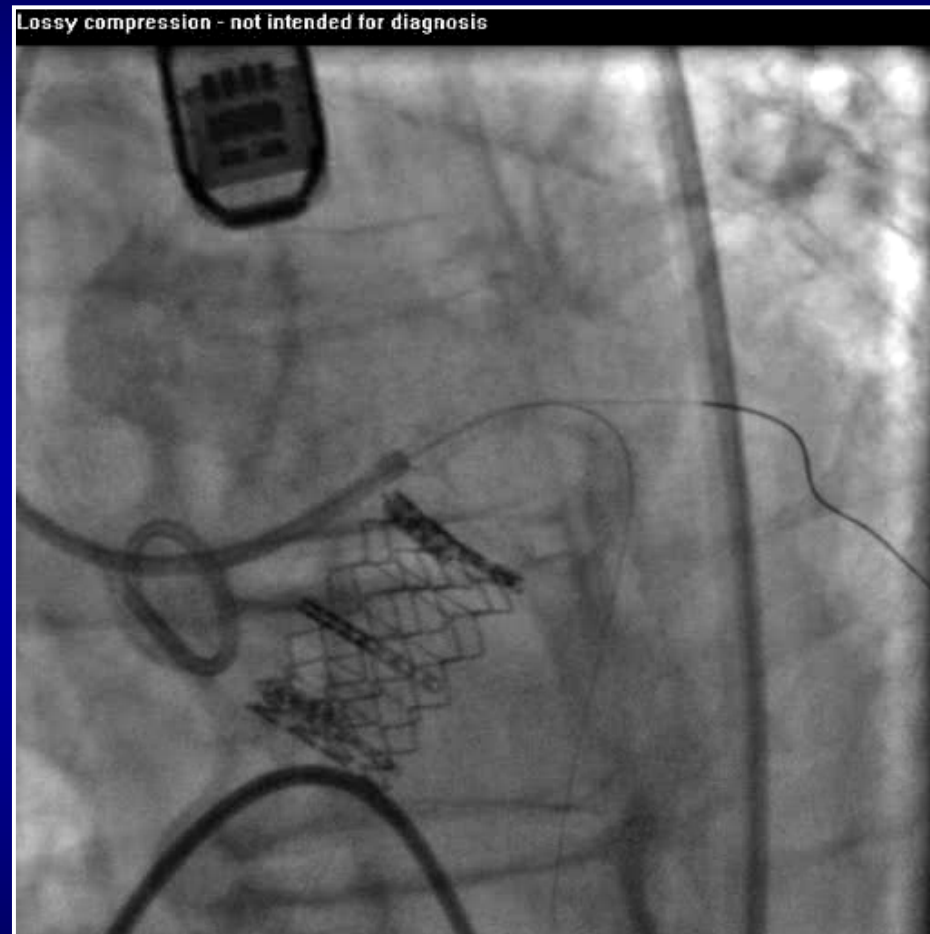
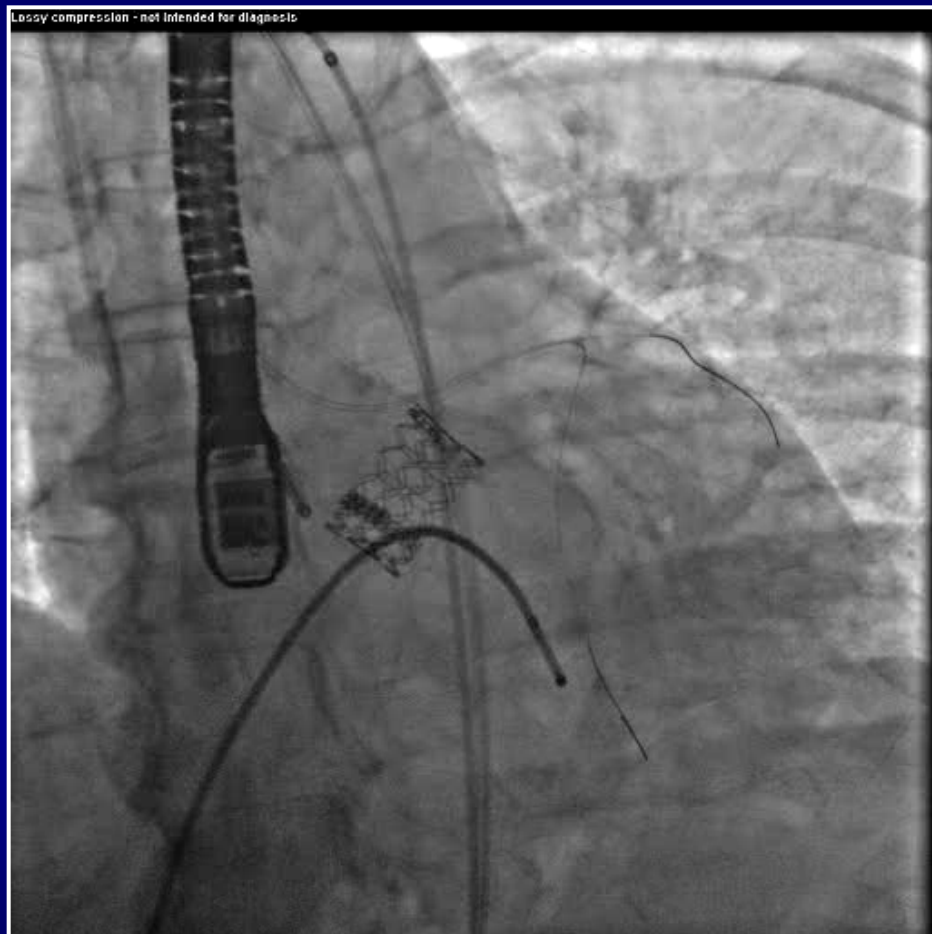


Deployment

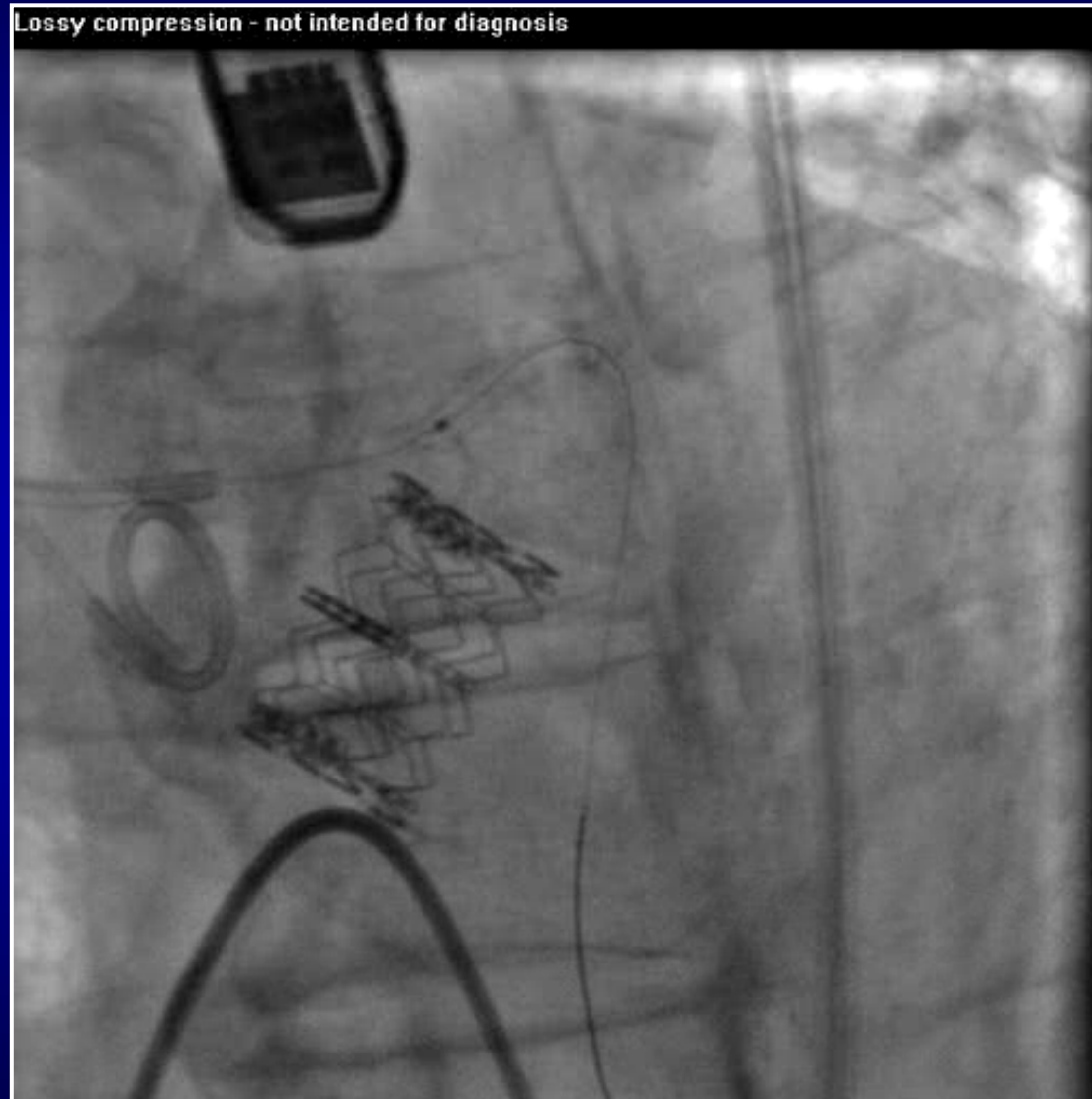
Lossy compression - not intended for diagnosis



Post Deployment



Attempt to IVUS Unsuccessful



LM angioplasty

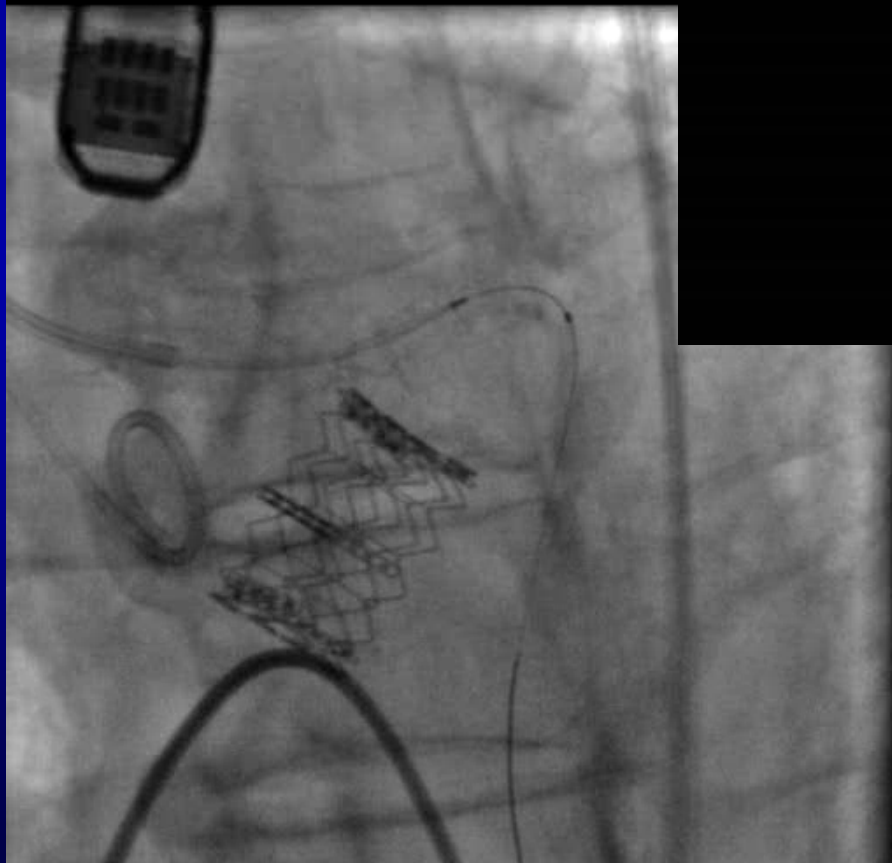
Lossy compression - not intended for diagnosis



Left Main IVUS post-Angioplasty

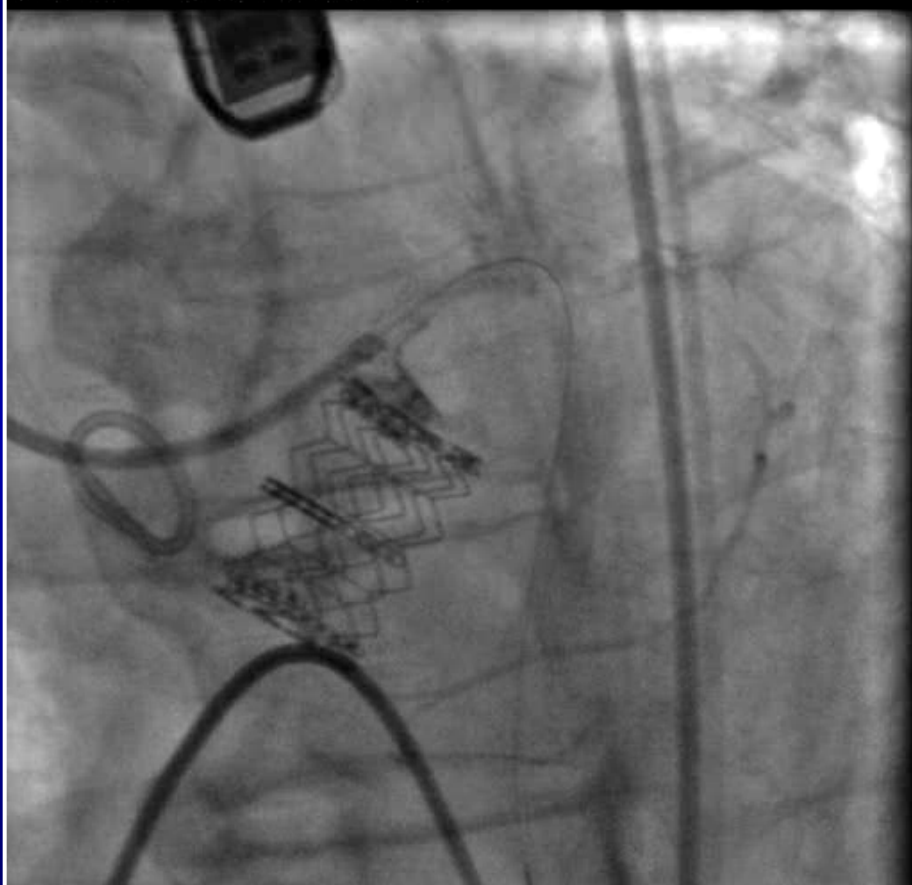


Lossy compression - not intended for diagnosis

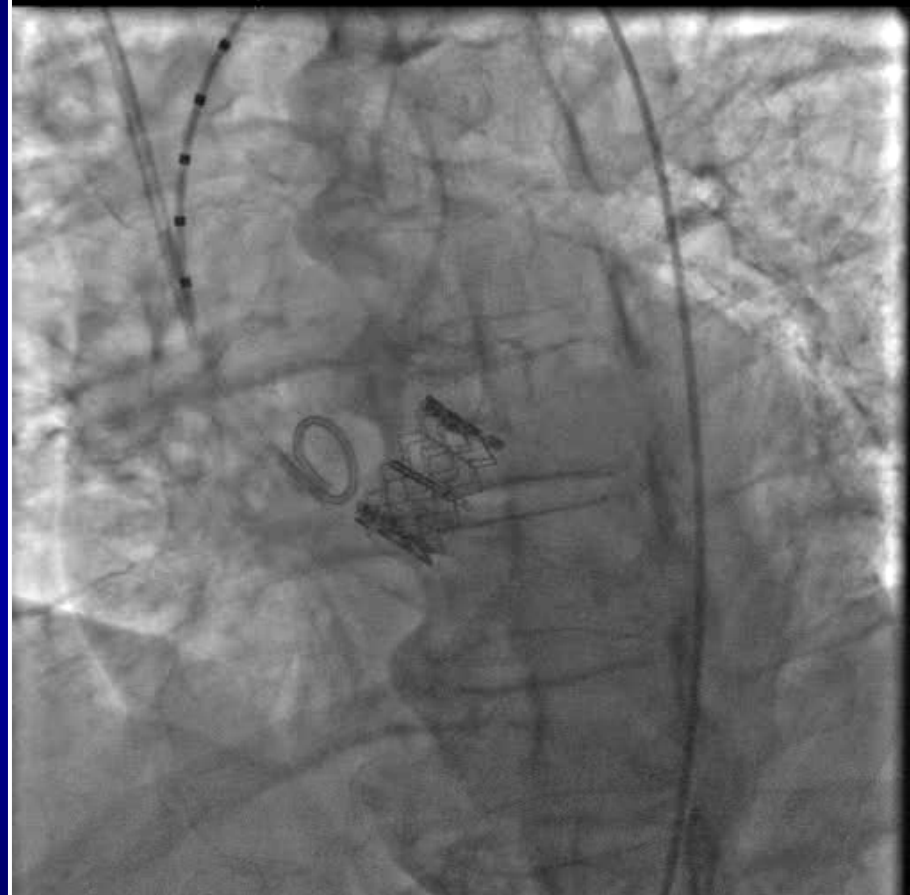


Final Result

Lossy compression - not intended for diagnosis



Lossy compression - not intended for diagnosis



Resolution of Gradients post-TAVI

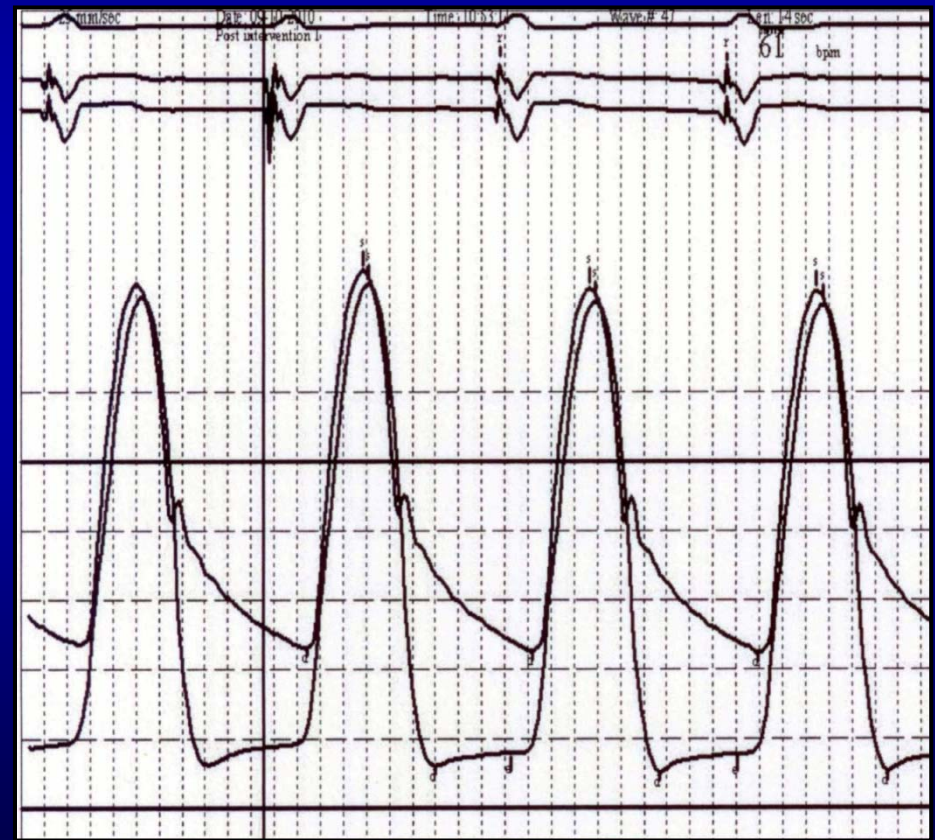
Pre-TAVI

Mean gradient 34 mmHg
Calculated AVA 0.66 cm²

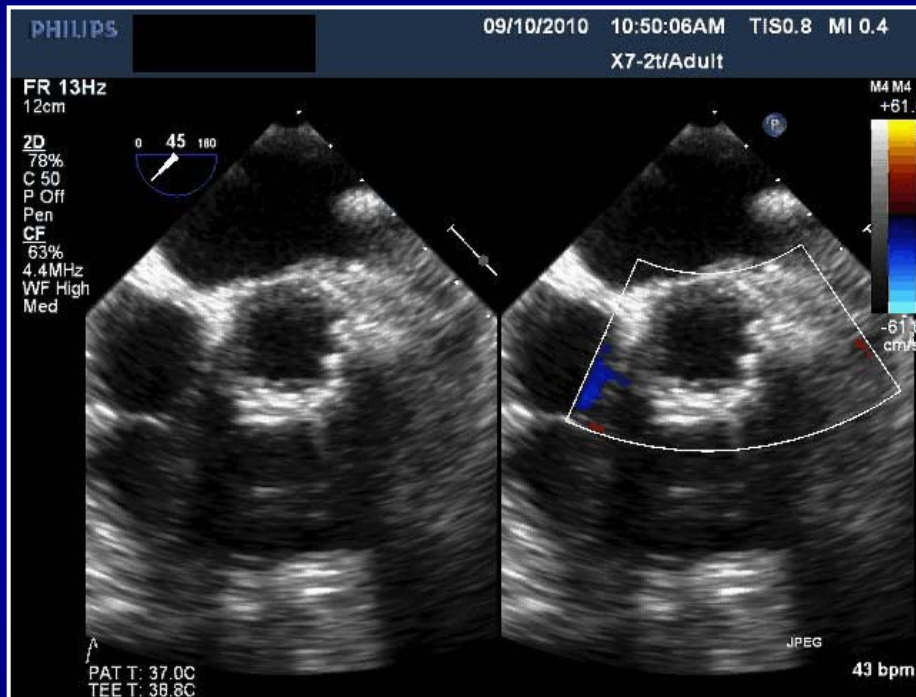


Post-TAVI

Mean gradient 5.5 mmHg
Calculated AVA 3.50 cm²

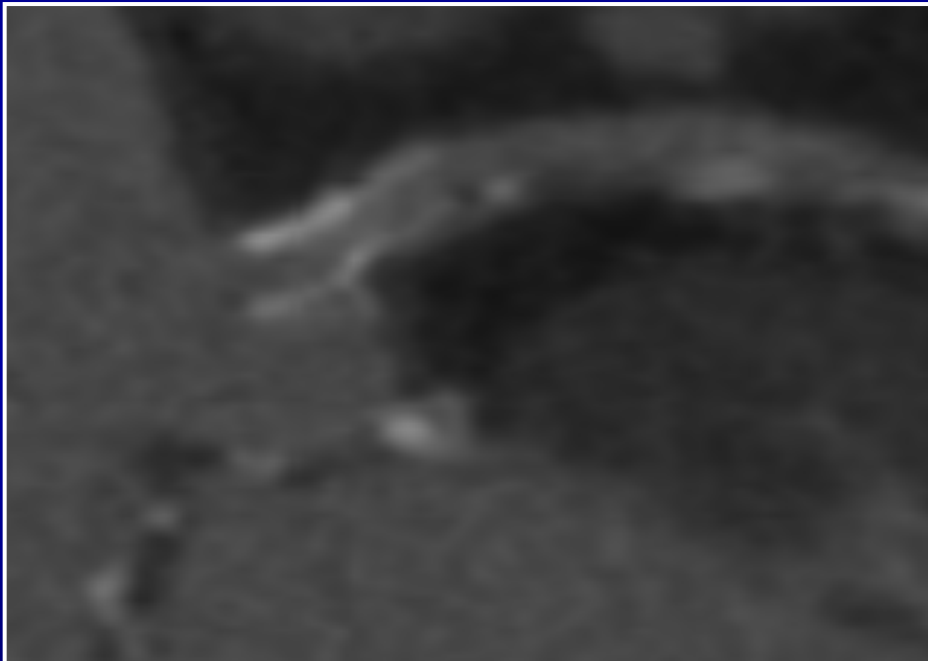


TEE (Post valve deployment)



Left Main Stent post-TAVI

Pre-TAVI



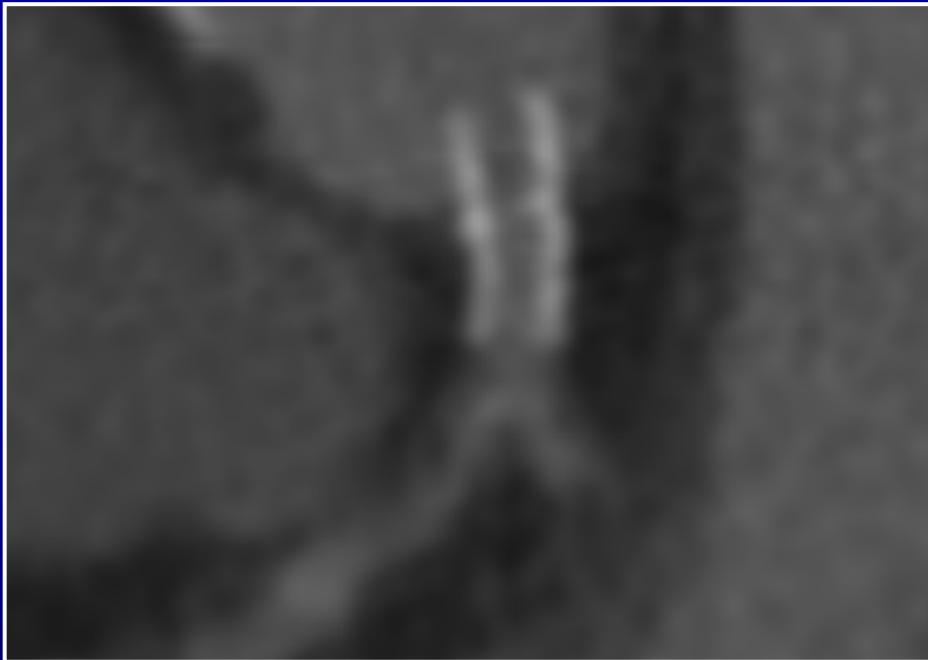
Post-TAVI



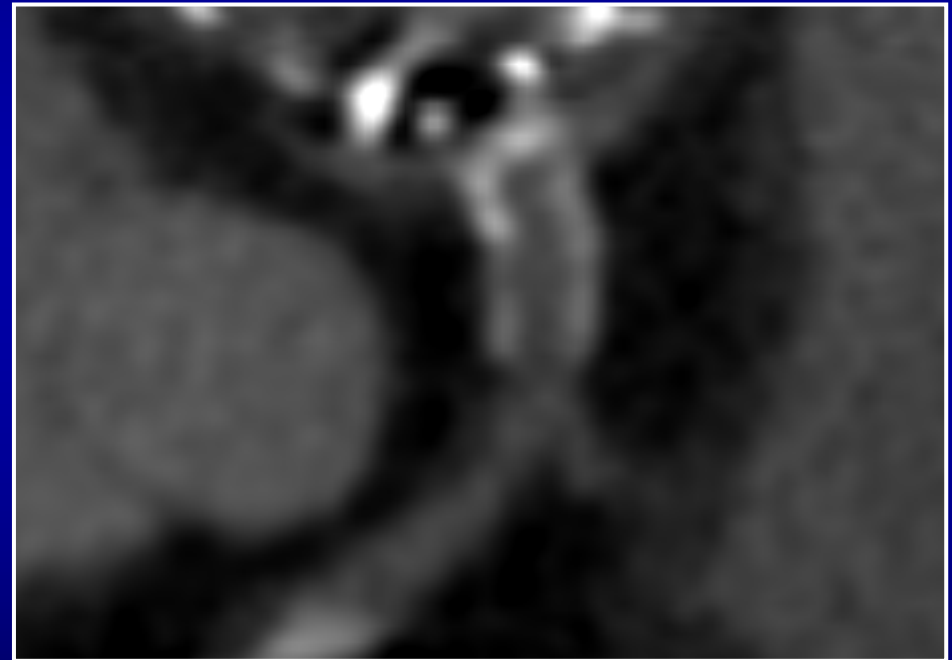
WV 2966, L 1421 67 bp

Left Main Stent post-TAVI

Pre-TAVI

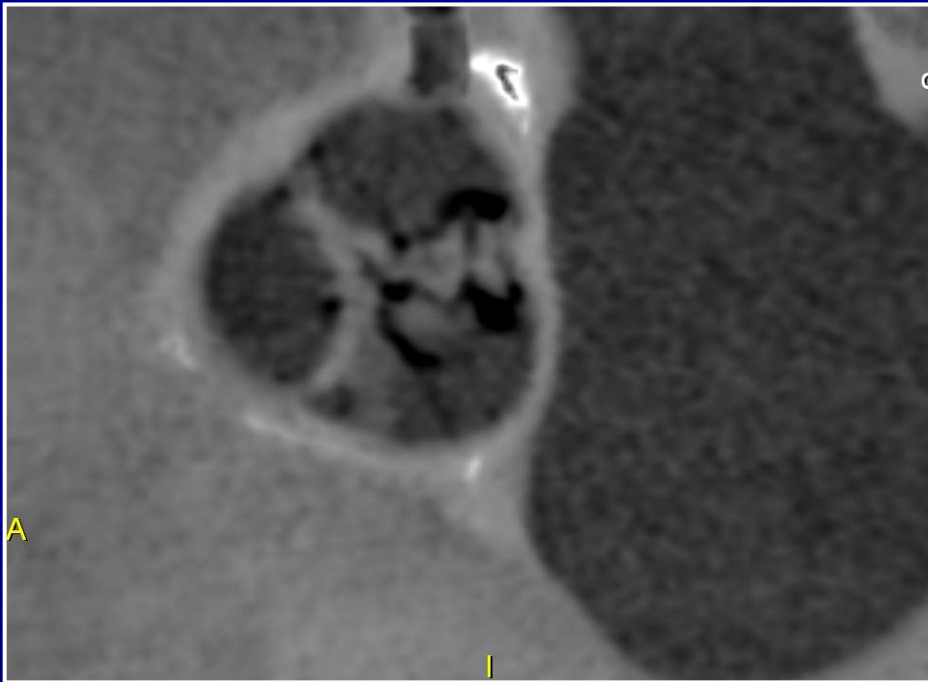


Post-TAVI



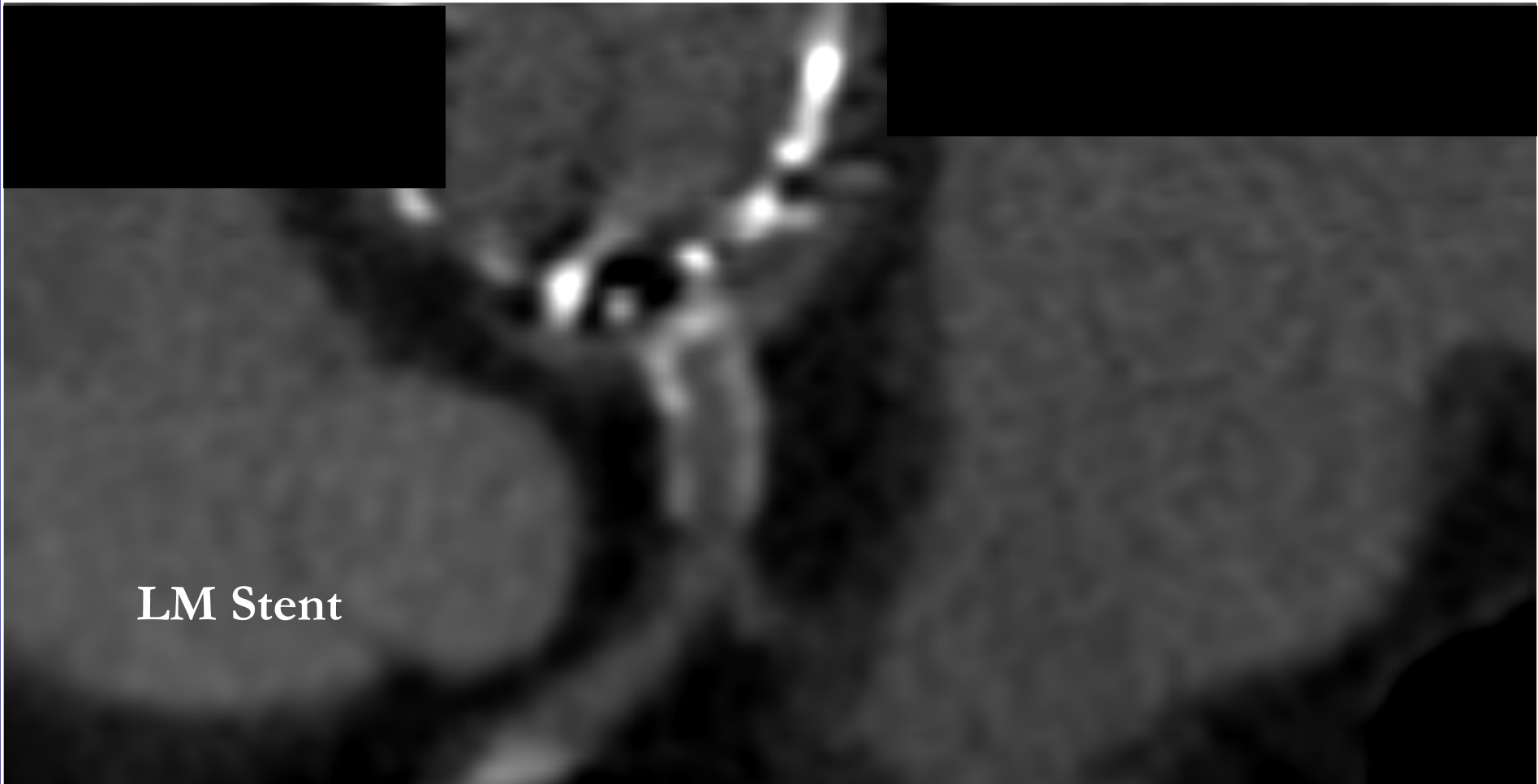
Aortic Valve in Diastole

Pre-TAVI



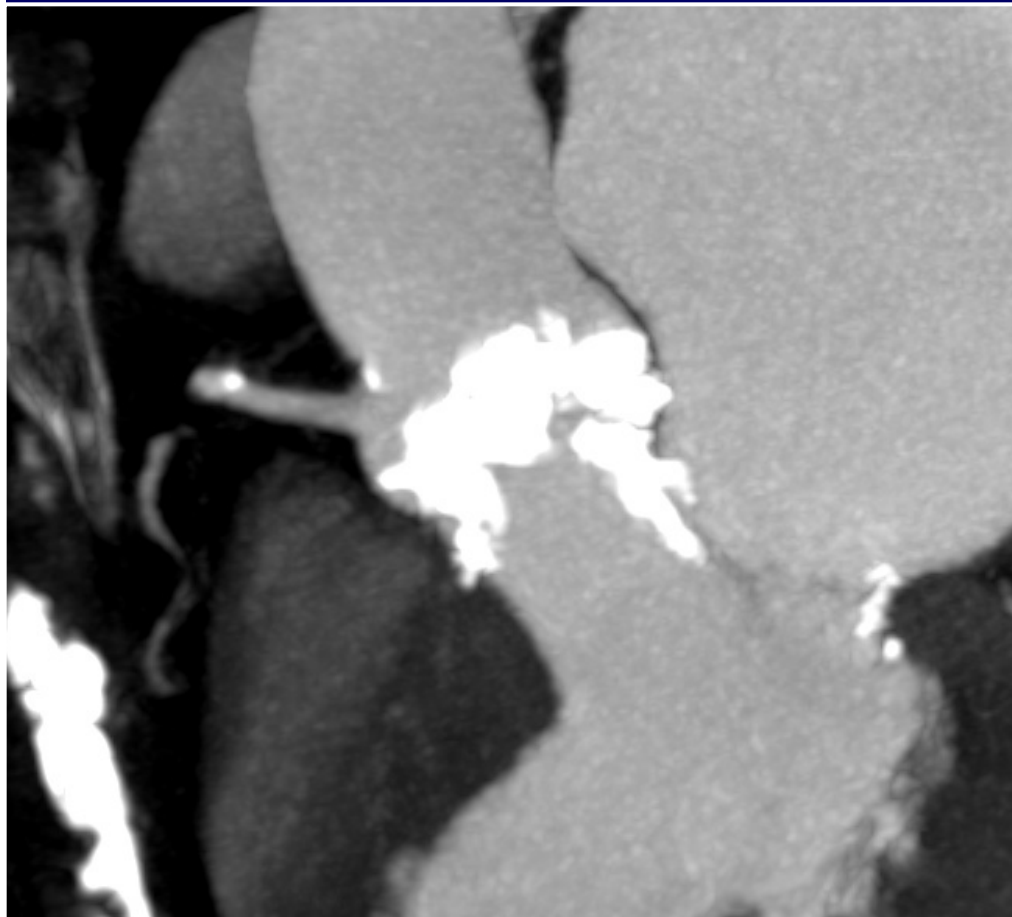
Post-TAVI





LM Stent

Bulky Calcium..

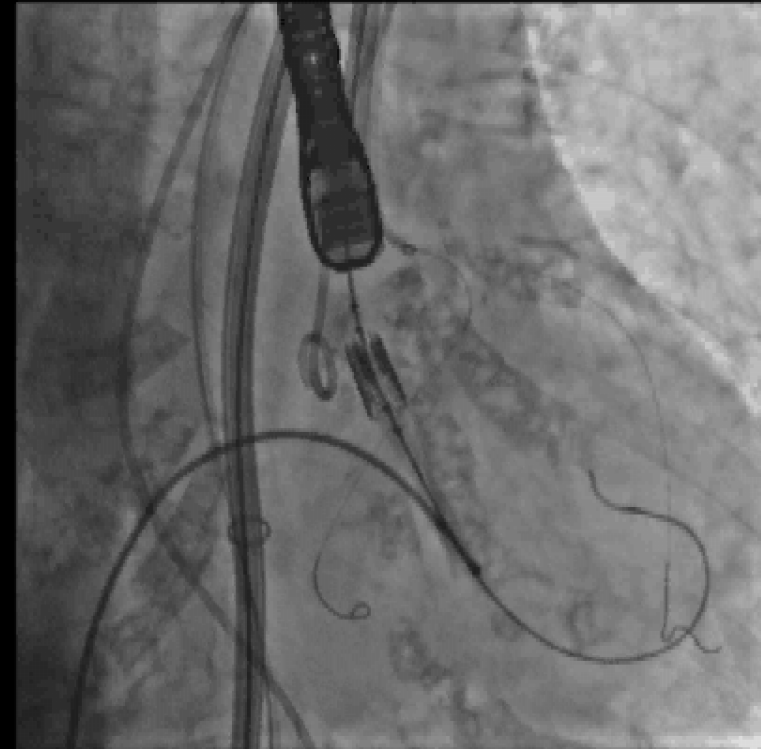


Bulky Calcium can make landmarks confusing, Consider prophylactic protection of left main ostium

Lossy Compression - not intended for diagnosis

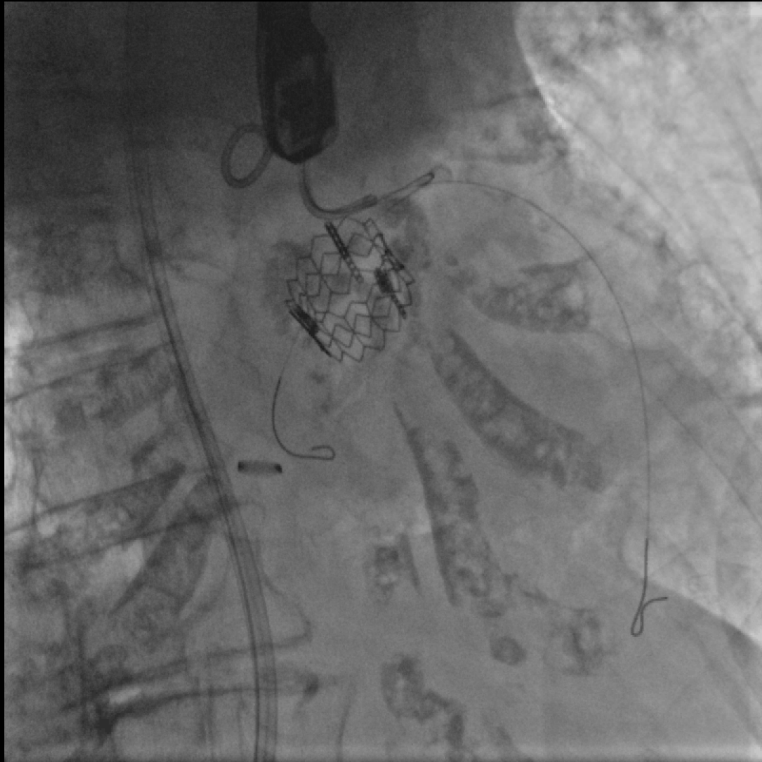


Lossy Compression - not intended for diagnosis



Post Deployment

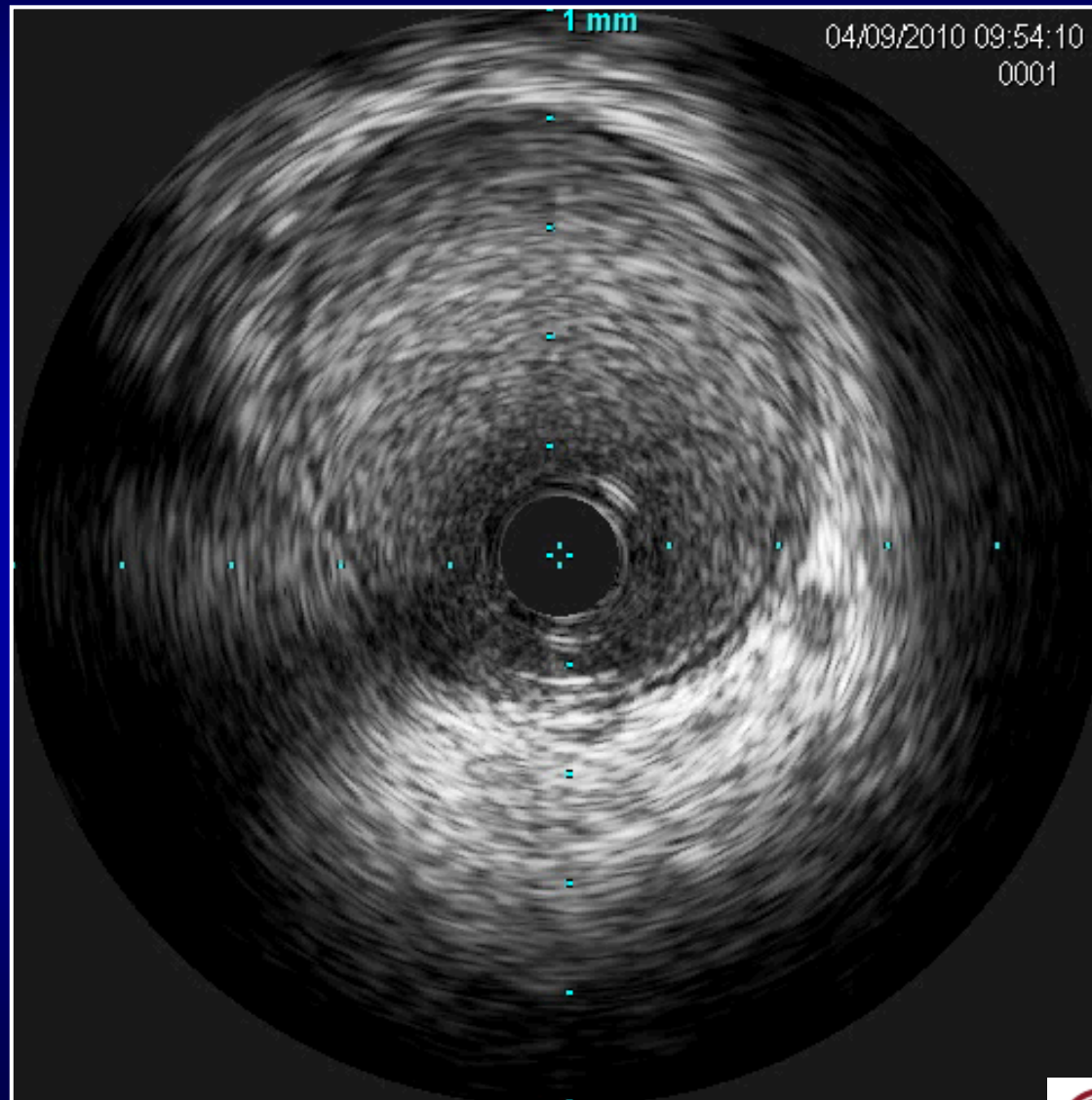
Lossy Compression - not intended for diagnosis

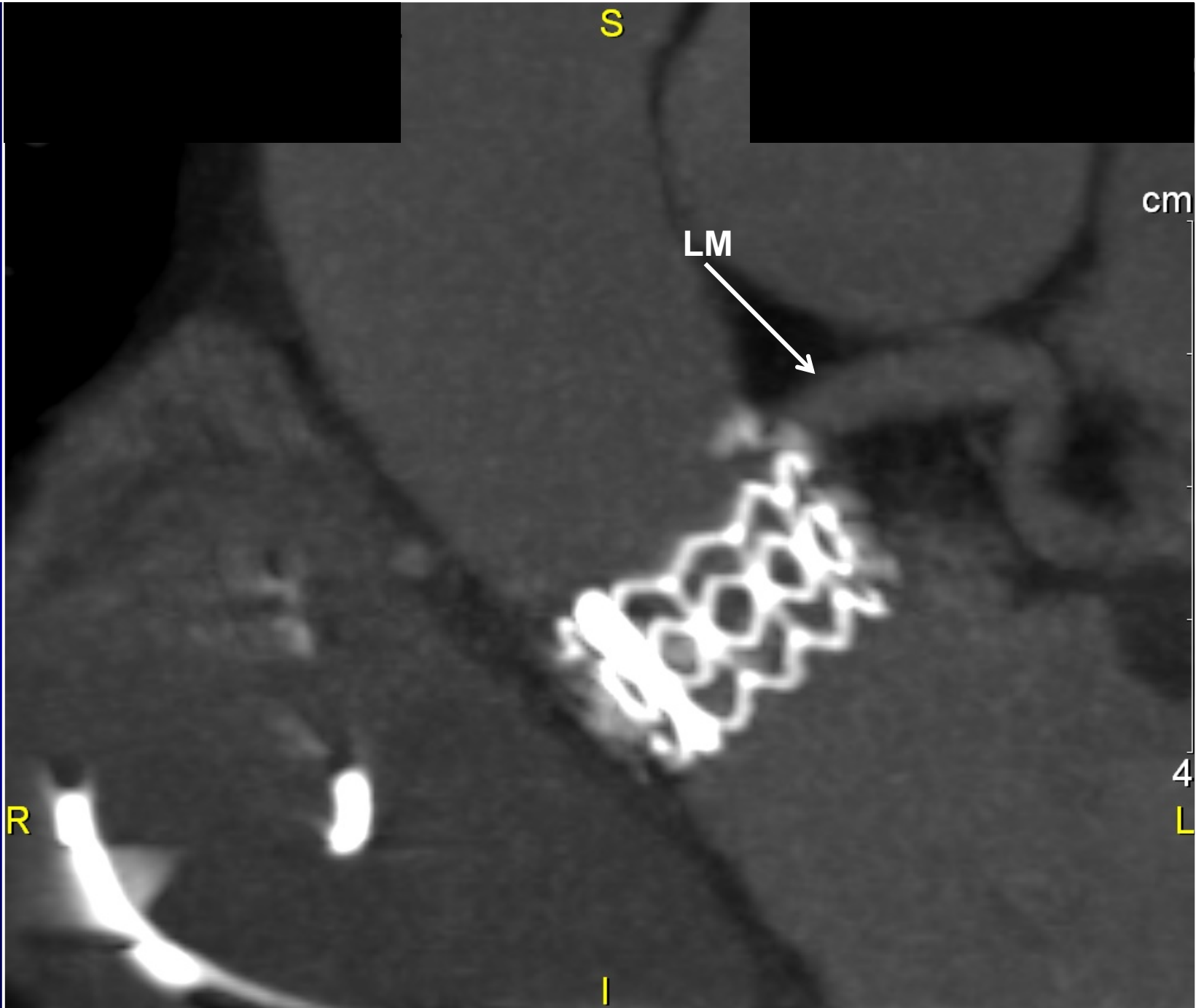


Lossy Compression - not intended for diagnosis



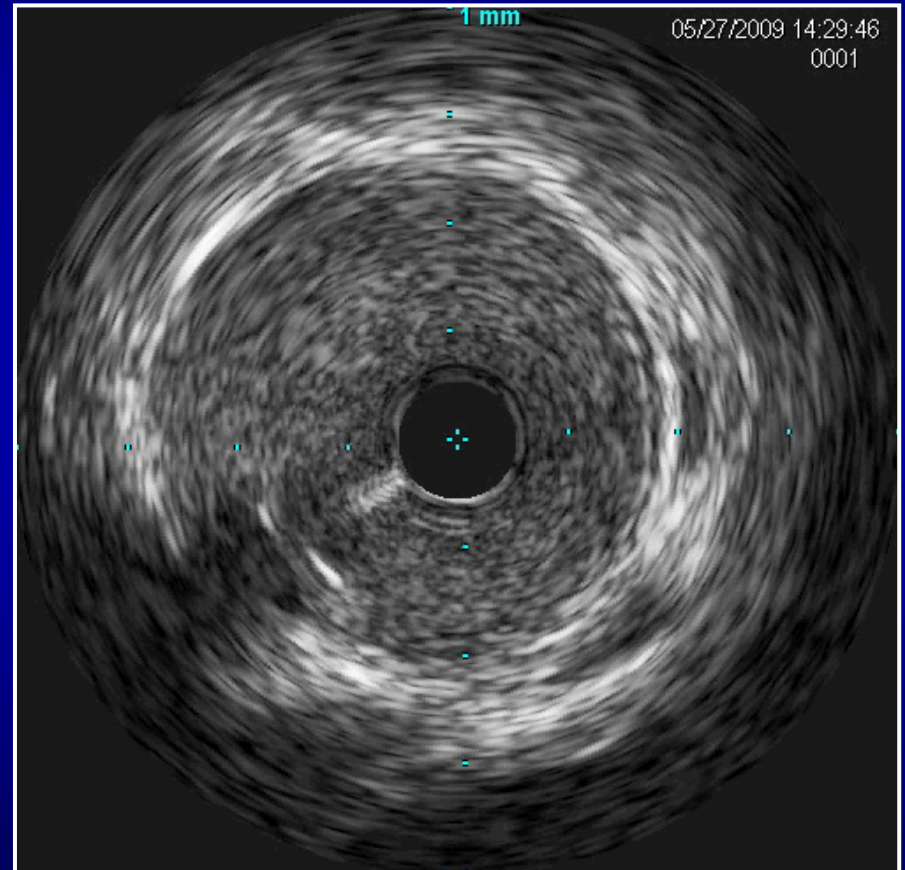
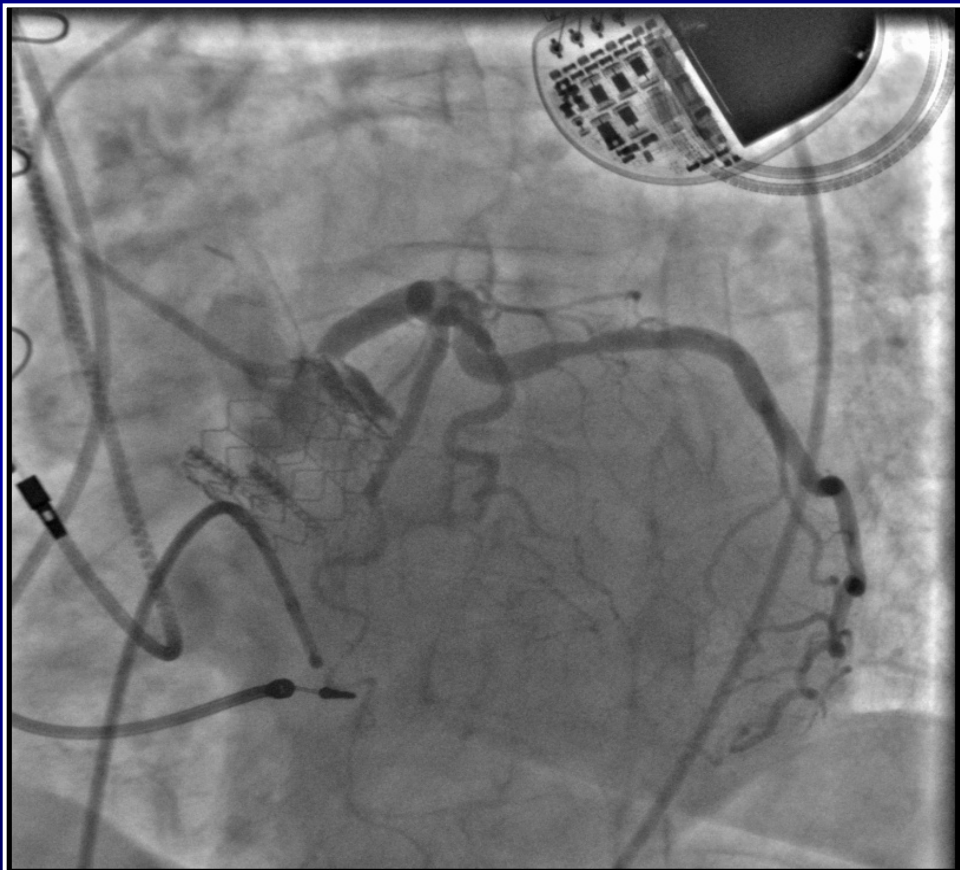
IVUS





W 2194, L 958 105 bpm, 31 %, 164 ms/01 DrM CTA C A P/27-33%

IVUS area 9 mm²
FFR 0.94



Teaching Points..

- It is helpful to understand the relationship of left main to the calcified aortic valve and the potential trans-catheter valve implant. CT is helpful.
- Protecting the left main is feasible during TAVI and should be considered in previously stented left mains and in cases that are high risk for left main occlusion (bulky calcium, low left main height from the annulus and very effaced coronary sinuses)
- After TAVR in patients with left main stent, IVUS should be done to ensure that the left main stent is not compromised