Combined BASILICA and IVUS-guided snorkeling tecniques for left main coronary protection in Valve-in-Valve TAVI at high-risk of coronary obstruction

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CLINICAL HISTORY

Female, 82-year-old

Past medical history:

Hypertension; dyslipidemia; CKD stage 3

2003: aortic valve replacement for severe symptomatic aortic stenosis with a **stentless bioprosthetic valve Prima Plus 23 mm**

Clinical presentation (2020):

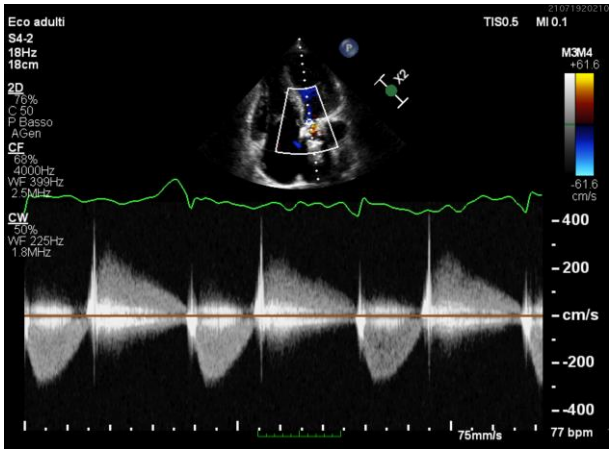
Hospital admission for worsening dyspnoea (NYHA III) and ankles swelling.

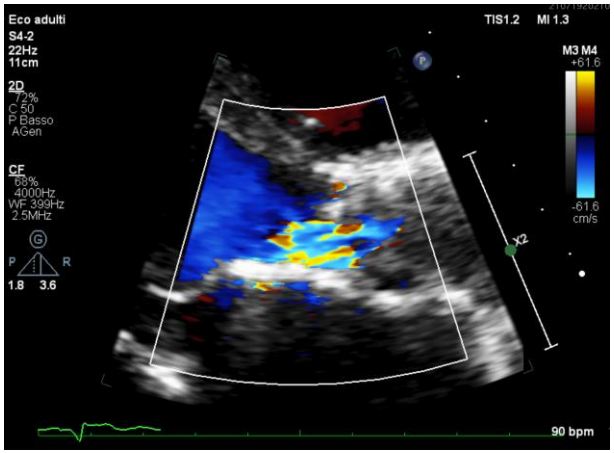
Echocardiography: Bioprosthesis degeneration with severe aortic regurgitation with diastolic flow reversal in the abdominal aorta

Indicated treatment (following Heart Team): **valve-in-valve TAVI**

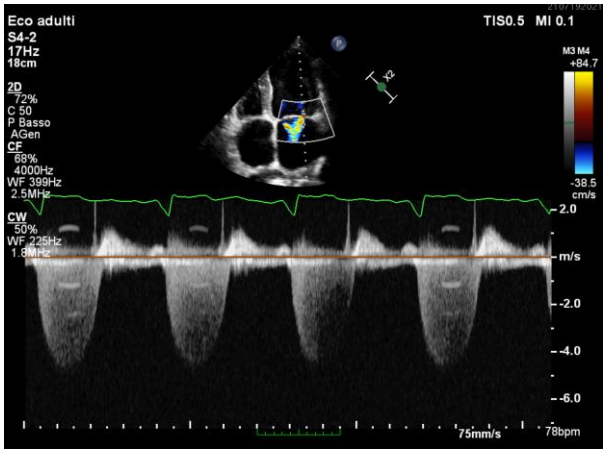
ECHOCARDIOGRAPHIC ASSESSMENT

- Severe left ventricular dilatation (VTD 103 mL/mq) with diffuse hypokinesis and sistolic moderate disfunction (LVEF 37%)
- Dilated right ventricle with mild disfunction
- Bioprosthesis degeneration: **severe aortic regurgitation** with diastolic flow reversal in the abdominal aorta
- Moderate mitral regurgitation
- Moderate tricuspid regurgitation with severe pulmonary hypertension (PAPs 60 mmHg)





Severe aortic regurgitation



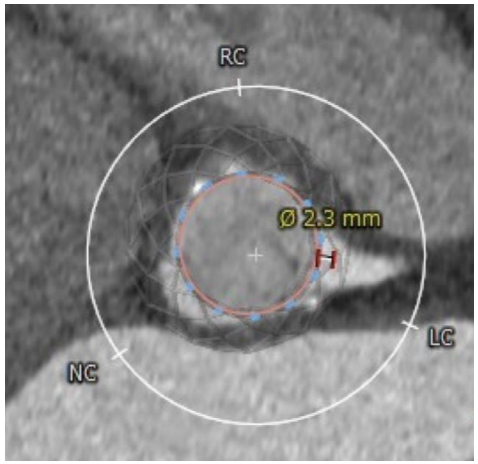
Moderate mitral regurgitation

PRE-PROCEDURAL ASSESSMENT

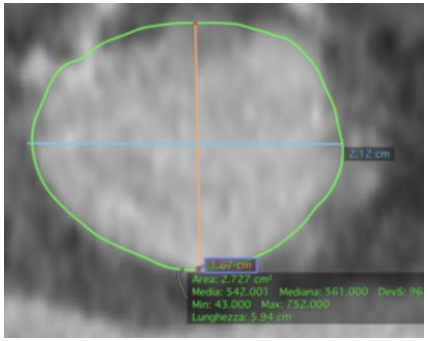
Coronary angiography: mild coronary atherosclerosis in absence of significant coronary stenosis.

Pre-TAVI Computed Tomography (CT) assessment:

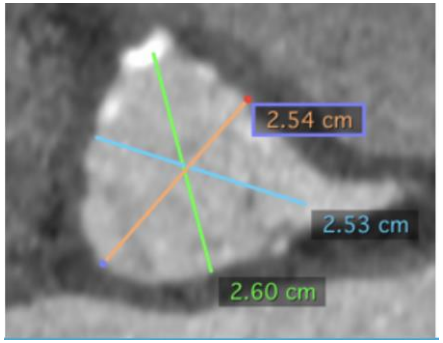
- Non-calcific degenerated bioprosthesis
- High-risk features for left main coronary occlusion
  - Left main coronary ostium height (<10 mm) –> 3.7 mm
  - Sinuses of Valsava width (< 30 mm) –> 25x24x24 mm
  - Left coronary artery virtual transcatheter heart valve to coronary distance (< 4 mm) –> 2.3 mm



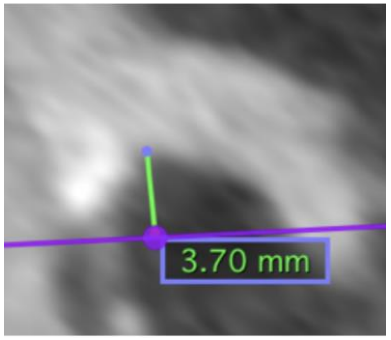
Left Coronary Artery (LCA) Virtual Transcatheter heart valve to Coronary distance (VTC)



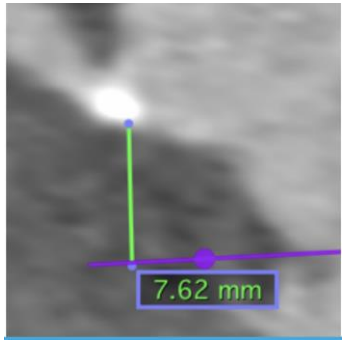
Annulus: area 2.7 cm2; diameters 21x16 mm.



Sinuses width



Left ostium height



Right ostium height

STEP 1– CEREBRAL PROTECTION AND BASILICA

Cerebral protection system

In the first instance, from the right radial artery, the cerebral protection system was positioned in both common carotid arteries.

Snare System

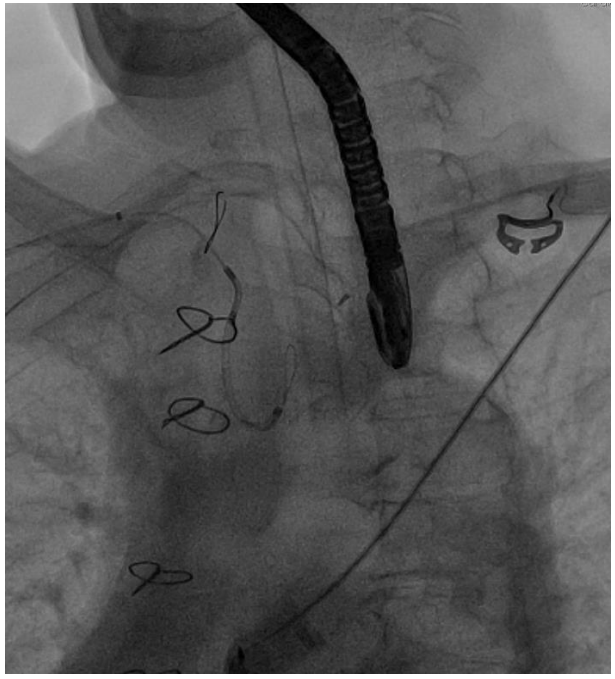
A 6Fr multipurpose (MP) guide and an Amplatz GooseNeck™ snare with V18 guidewire were positioned in the left ventricular outflow tract.

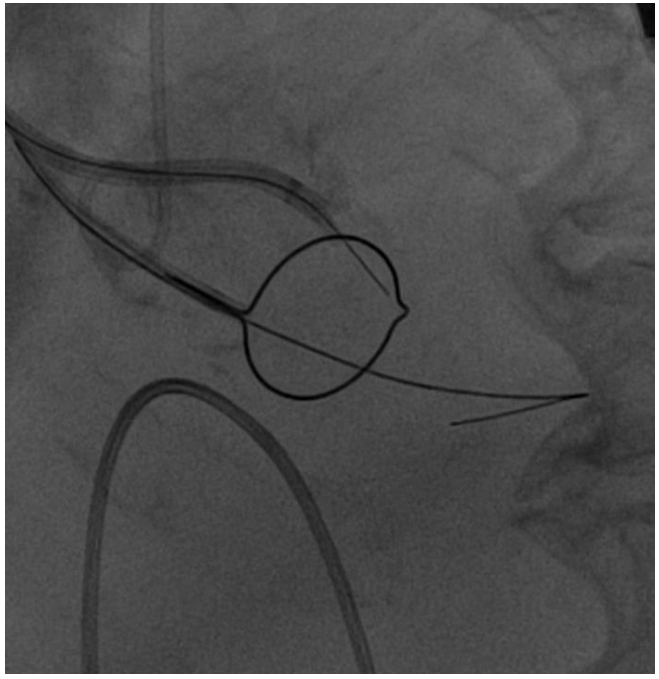
Traversal System

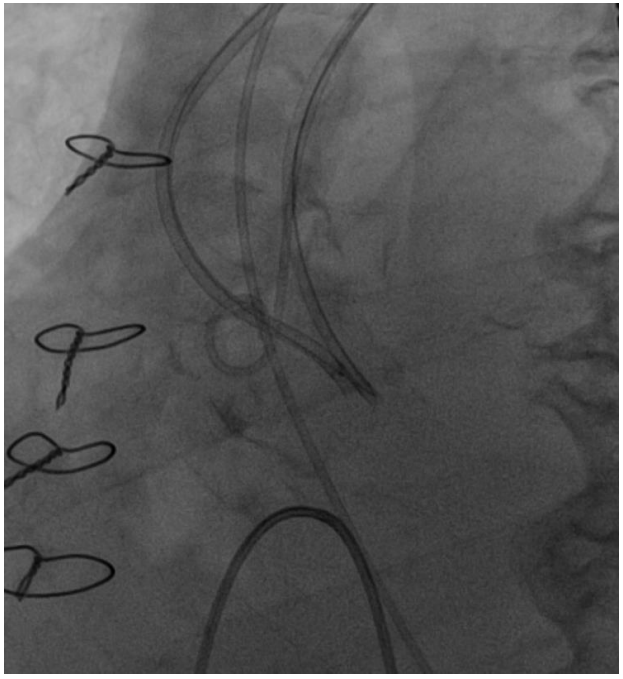
AL 3 8Fr + IM 5Fr catheter + PiggyBack + Astato XS 20 300 cm

Cusp base perforation

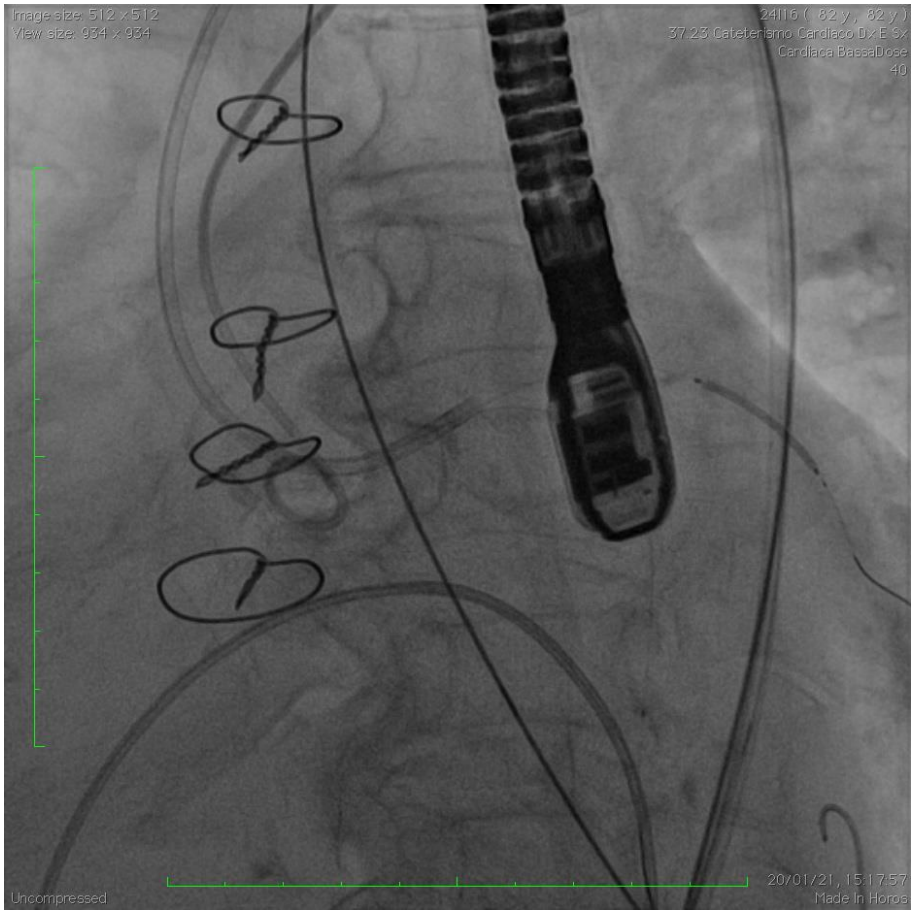
with Astato guide and high energy electrocautery (50 Watt) and then **wire snaring, Vshape and leaflet laceration.** TEE confirmed leaflet's laceration.

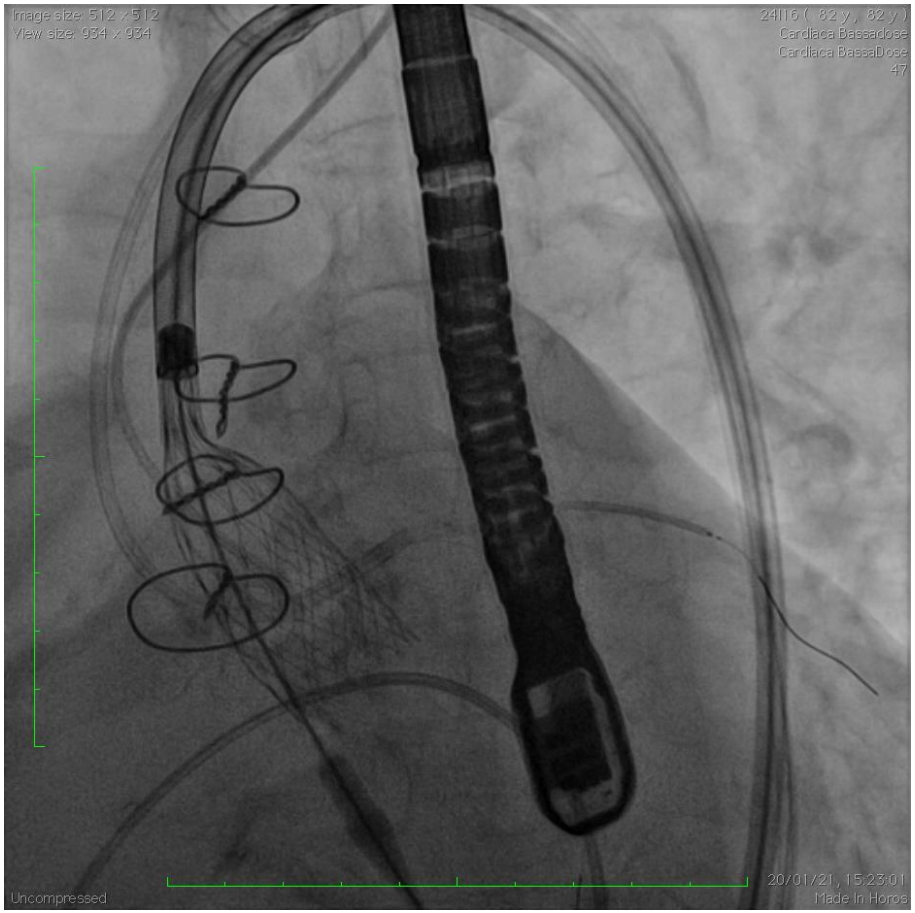






STEP 2 – SNORKEL TECHNIQUE PREPARATION
STEP 3- COREVALVE EVOLUT R 23 MM



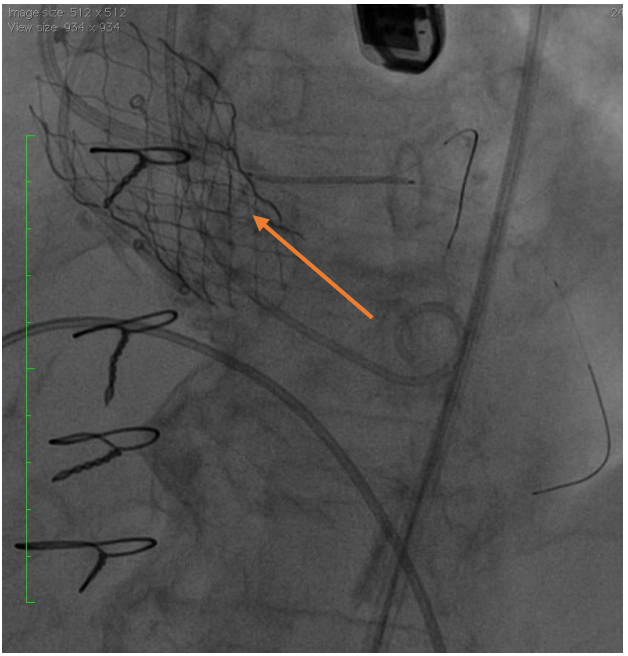


Engagement of LM ostium with EBU 3.5 guide catheter. Undeployed Zotarolimus-eluting stent (4.0x25 mm) positioned in the left anterior descending artery (LAD).

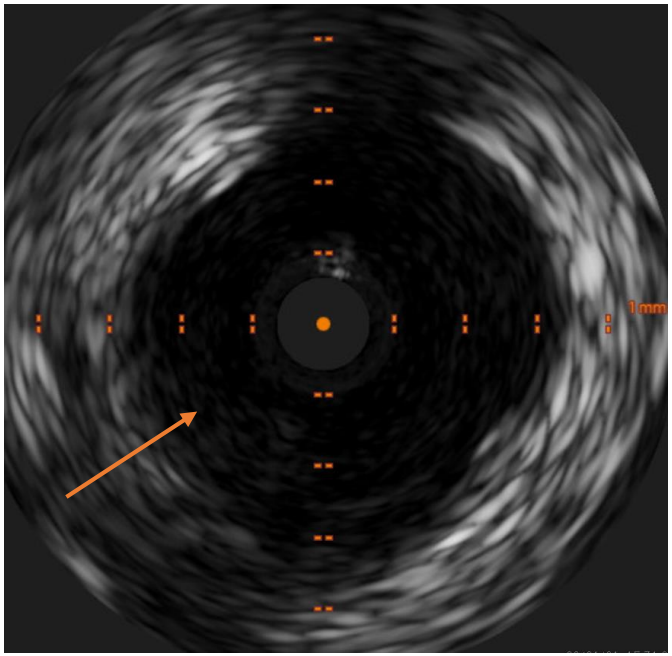
CoreValve Evolut R 23 mm deployed during rapid ventricular pacing

STEP 4 – ANGIOGRAPHIC/IVUS LM ASSESSMENT

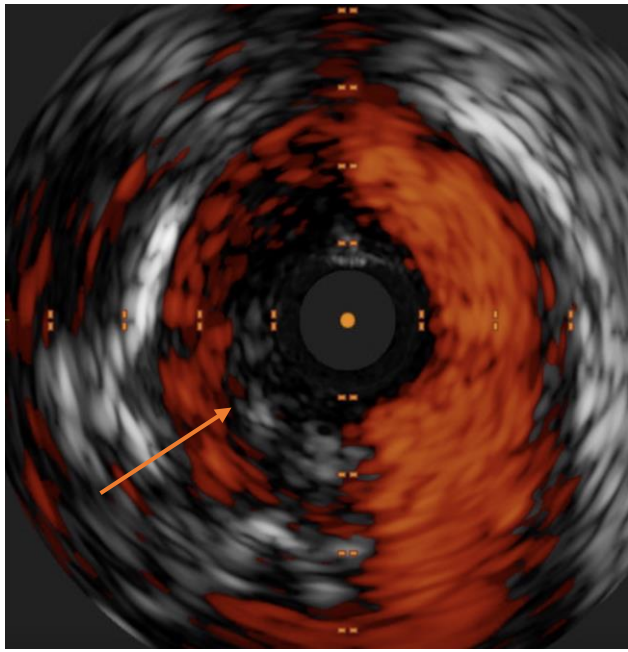
ANGIOGRAPHY



IVUS

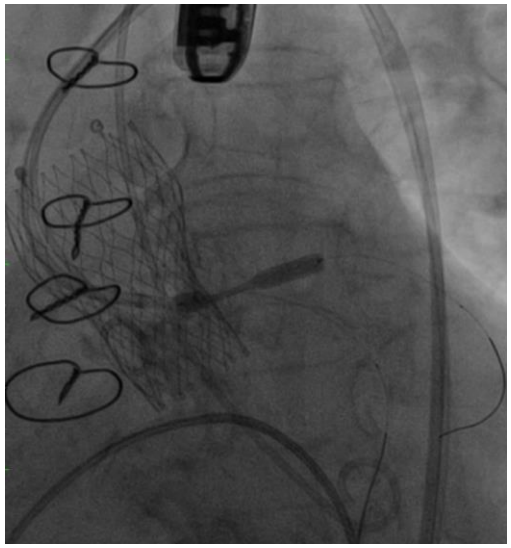


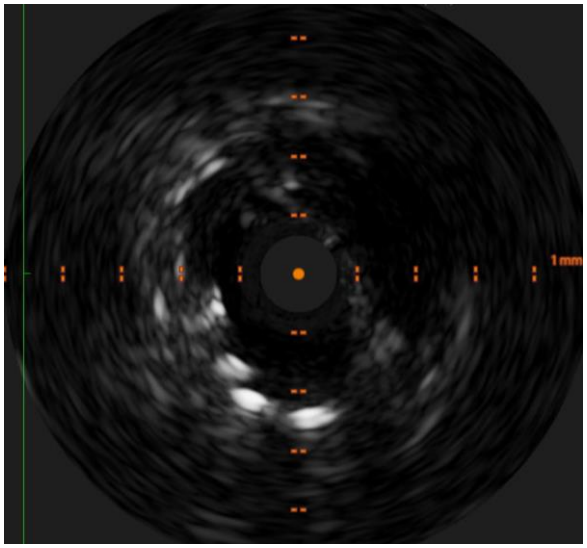
CHROMAflo



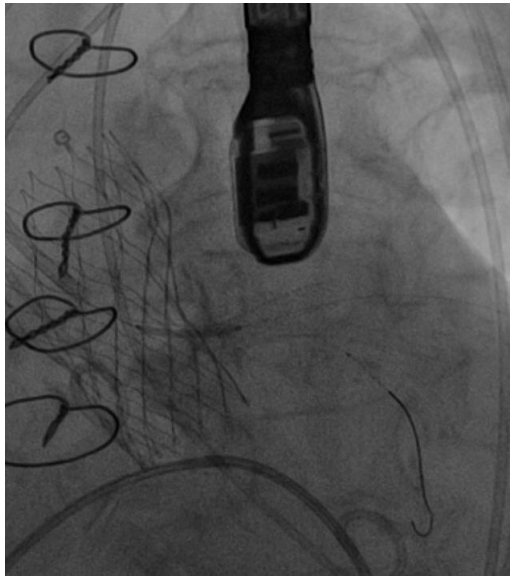
Partial obstruction of the left main ostium due to the lacerated leaflet

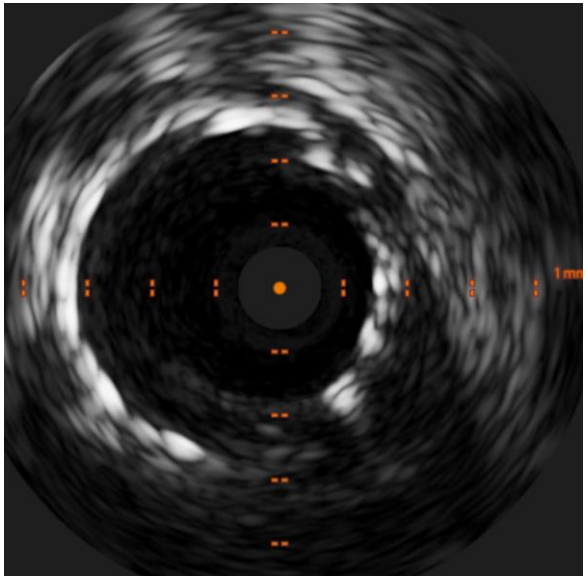
STEP 5 – LM SNORKEL STENTING

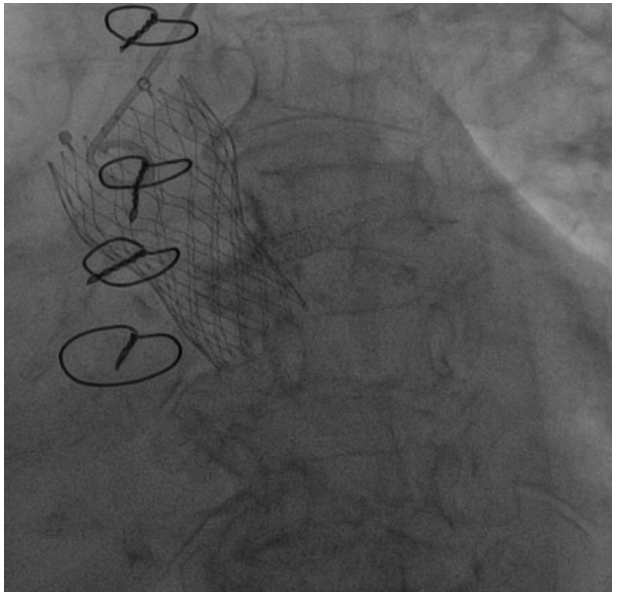




- Implantation of the un-deployment stent in the left main ostium.
- IVUS assessment with residual stent underexpansion
- 2nd Zotarolimus-eluting stent (4.0x15mm) to increase the radial force
- Post-dilation with 5.0 mm NC balloon



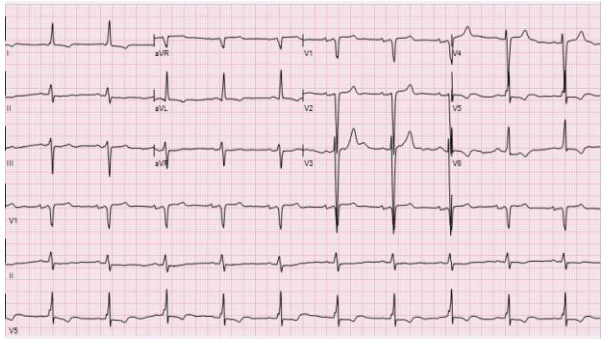


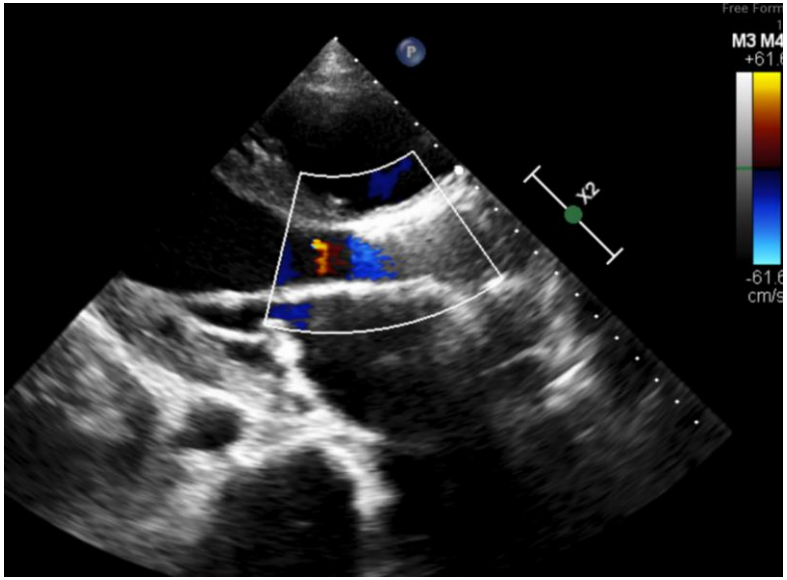


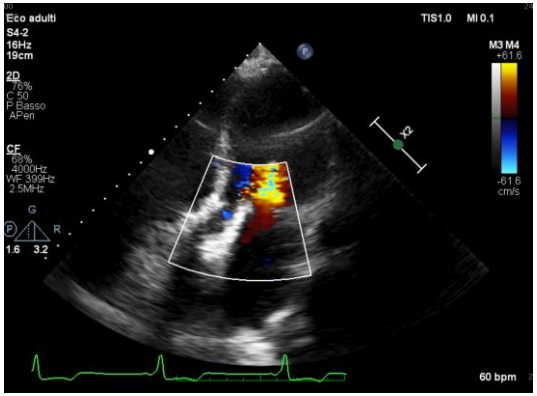
DISCHARGE

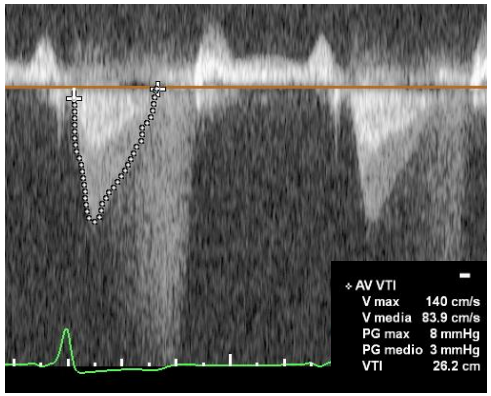
Patient was discharged on day 3 after the procedure

TTE (day 1 after procedure):
severe dilated left ventricle, diffuse hypokinesis with no wall motion abnormalities and LVEF 40%; aortic peak gradient 20 mmHg, aortic mean gradient 9 mmHg ;









DISCHARGE

- Coronary obstruction is a potentially life-threatening complication of TAVI
- Surgical **stentless bioprosthesis ViV** procedures are at potential higher risk of coronary obstruction
- **BASILICA** is a suitable option for the protection of coronary arteries during TAVI
- The use of **IVUS** may represent:
  - a useful tool to assess the risk of post-ViV coronary artery occlusion
  - A key imaging modality to guide chimney/snorkel PCI techniques in such a challenging scenario and optimize the result