A case of structural heart intervention with mechanical circulatory support

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Conflict of Interest

- Speaker's fees from Abiomed

Medical History

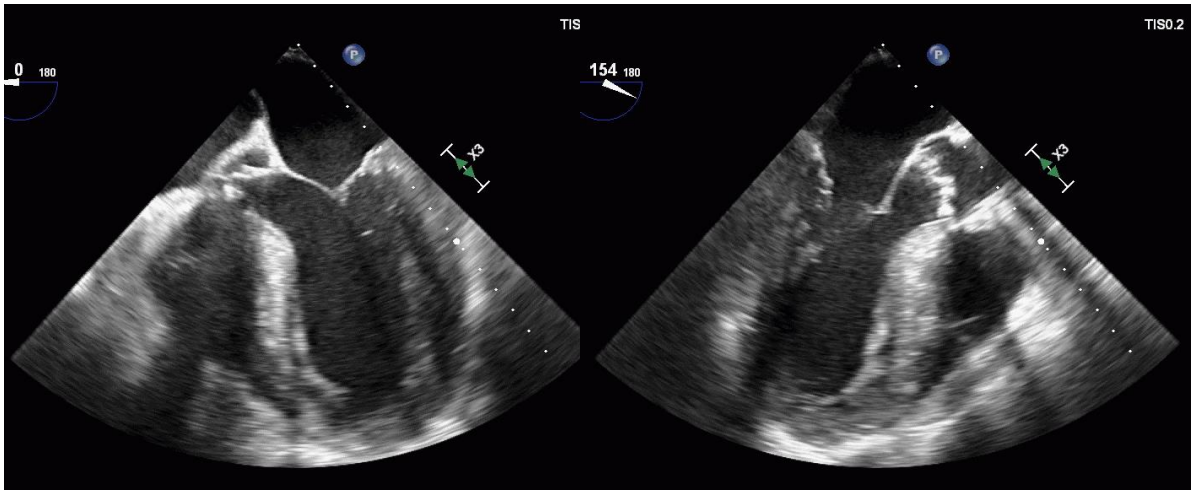
- **72-year-old gentleman**
- Risk factors:
  - Hypertension
  - Type 2 diabetes mellitus.
- History of coronary artery disease:
  - previous PCI on LAD
- Known asymtpomatic aortic stenosis.

Emergency Department admission

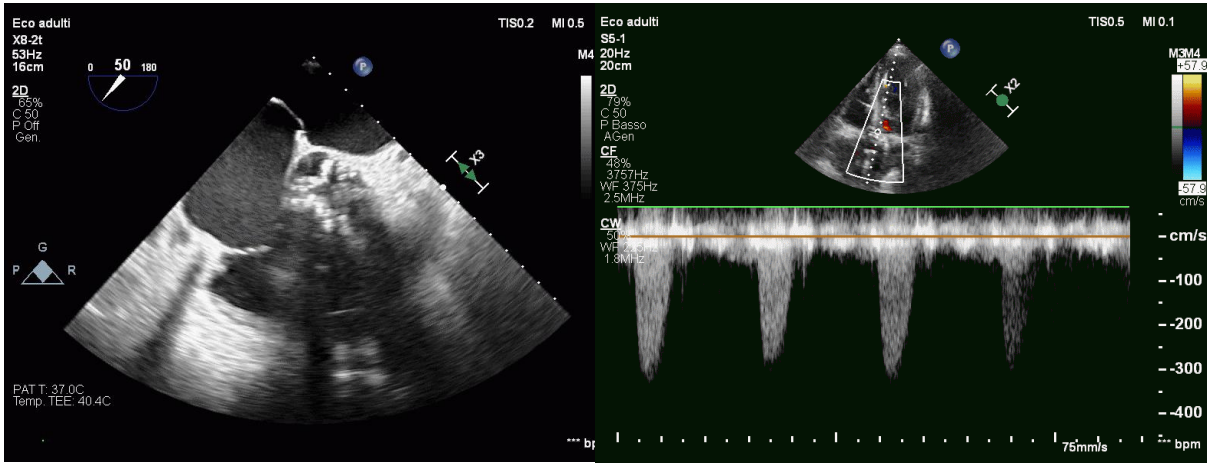
- **Anterior STEMI with late presentation**
- **Killip 4**

- **Treatment:**
- Oro-tracheal intubation
- High-dose inotropic support
- Urgent transfer to cath lab for coronary angiography performation

Transthoracic and transoesophageal echocardiography

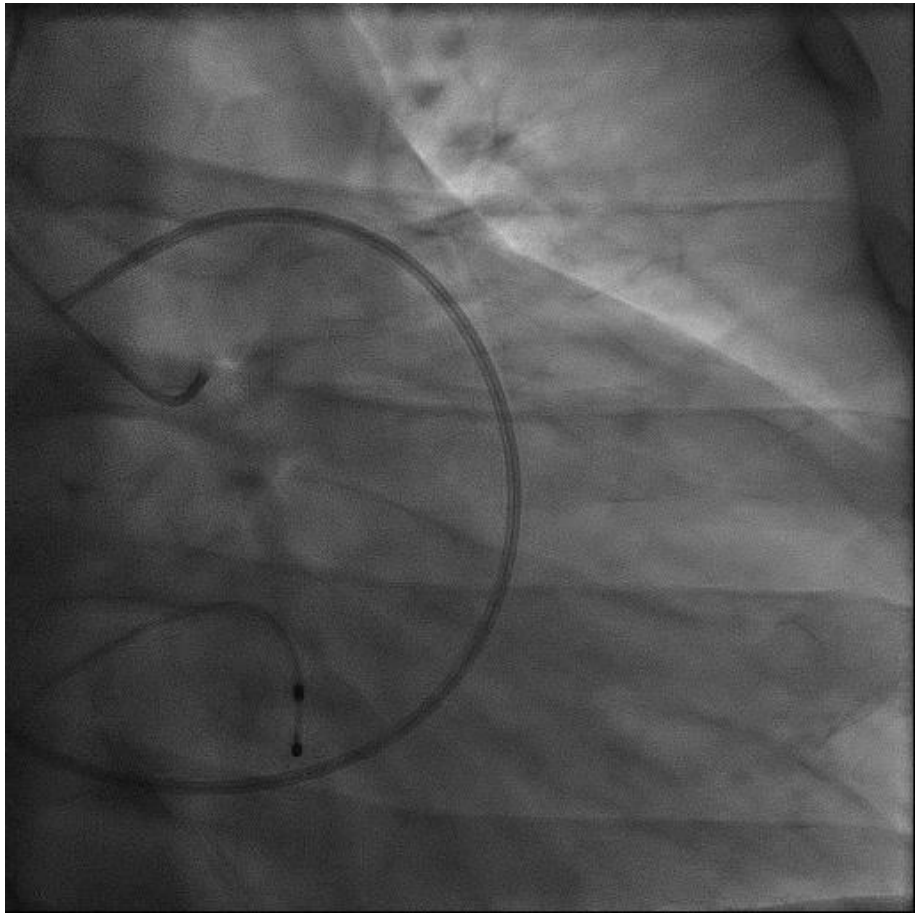


- Severe left ventricular dysfunction
- Antero-apical akinesia

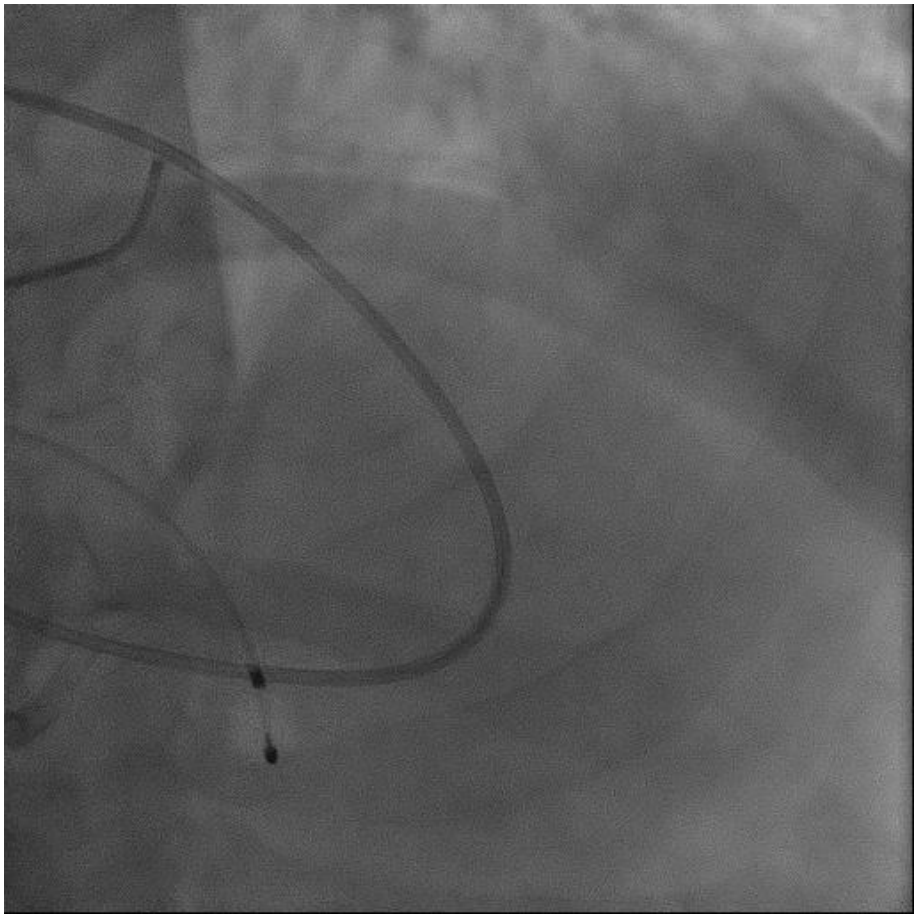


- Severe aortic stenosis

Coronary Angiography

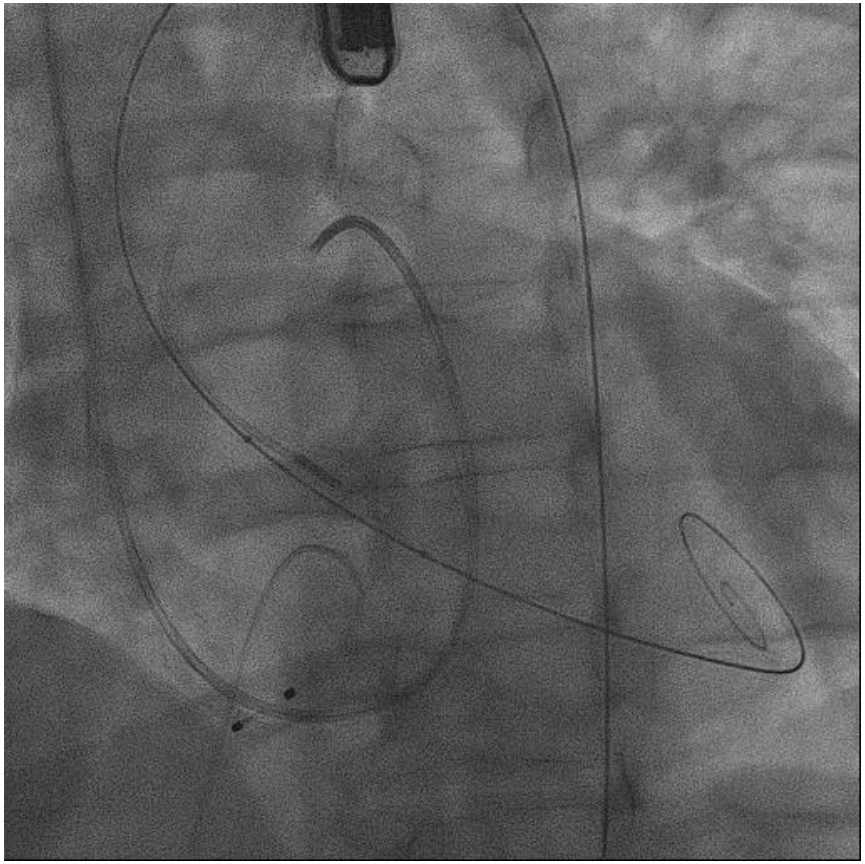


Critical Left Main (LM) - Ostial Left anterior descending artery (LAD) stenosis

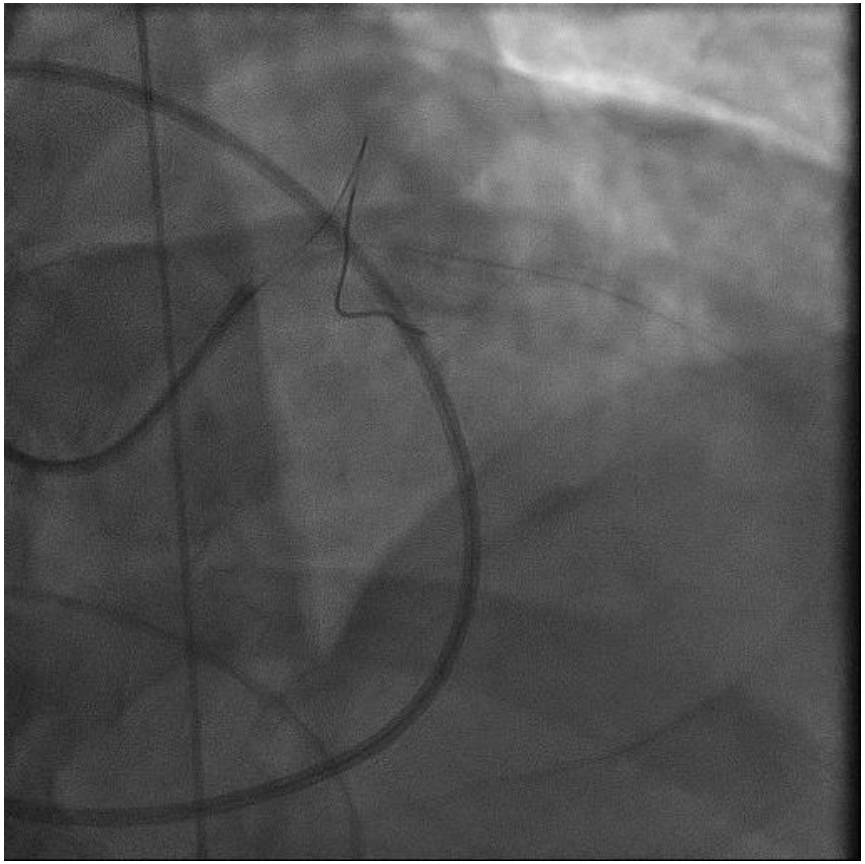


Subocclusive Intra-Stent Restenosis on proximal LAD (TIMI 1)

Percutaneous Procedure

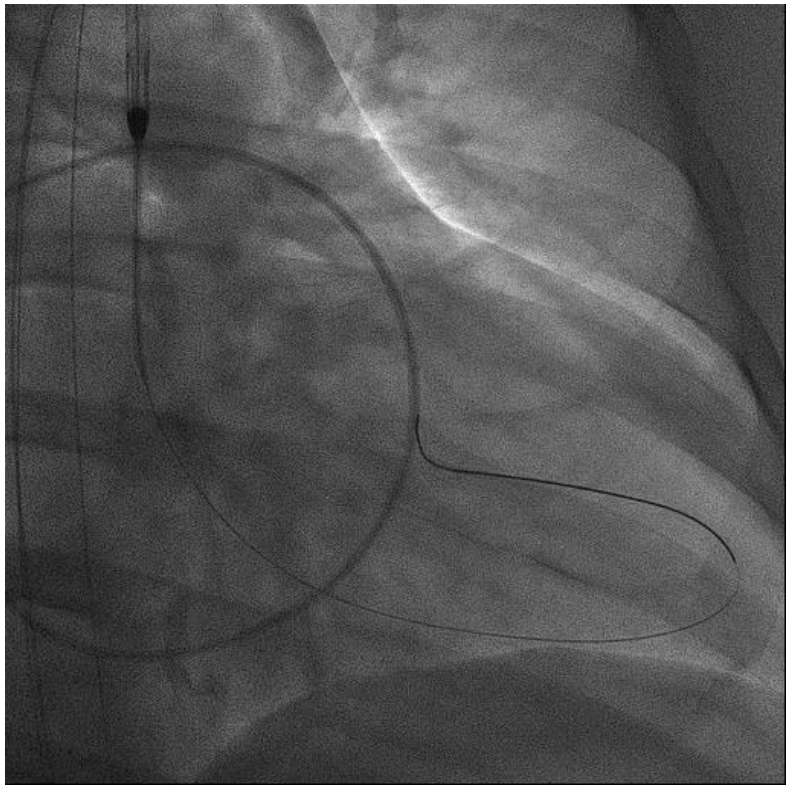


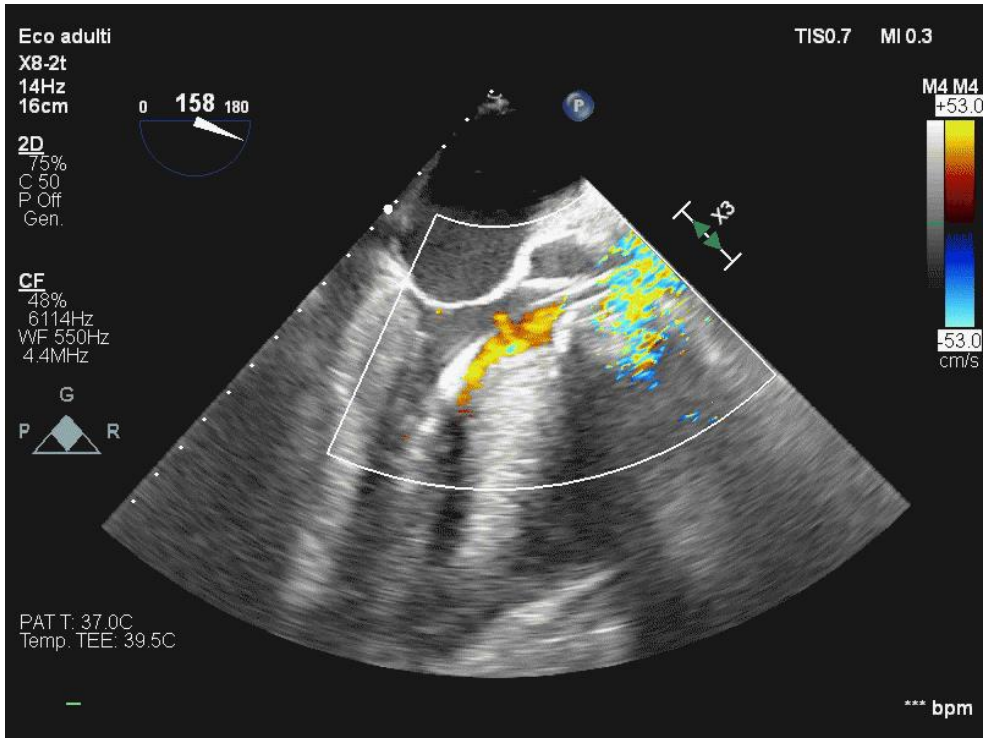
- Balloon Aortic Valvuloplasty 20 mm (right femoral access)
- IABP placement



- Ostial LM – proximal LAD predilatation with 2.5 mm balloon
- 3.0 x 33mm Everolimus eluting stent implantation
- Postdilatation with Non compliant 3.5mm balloon
- POT with non compliant 4.0 mm balloon

Intraprocedural Echocardiography





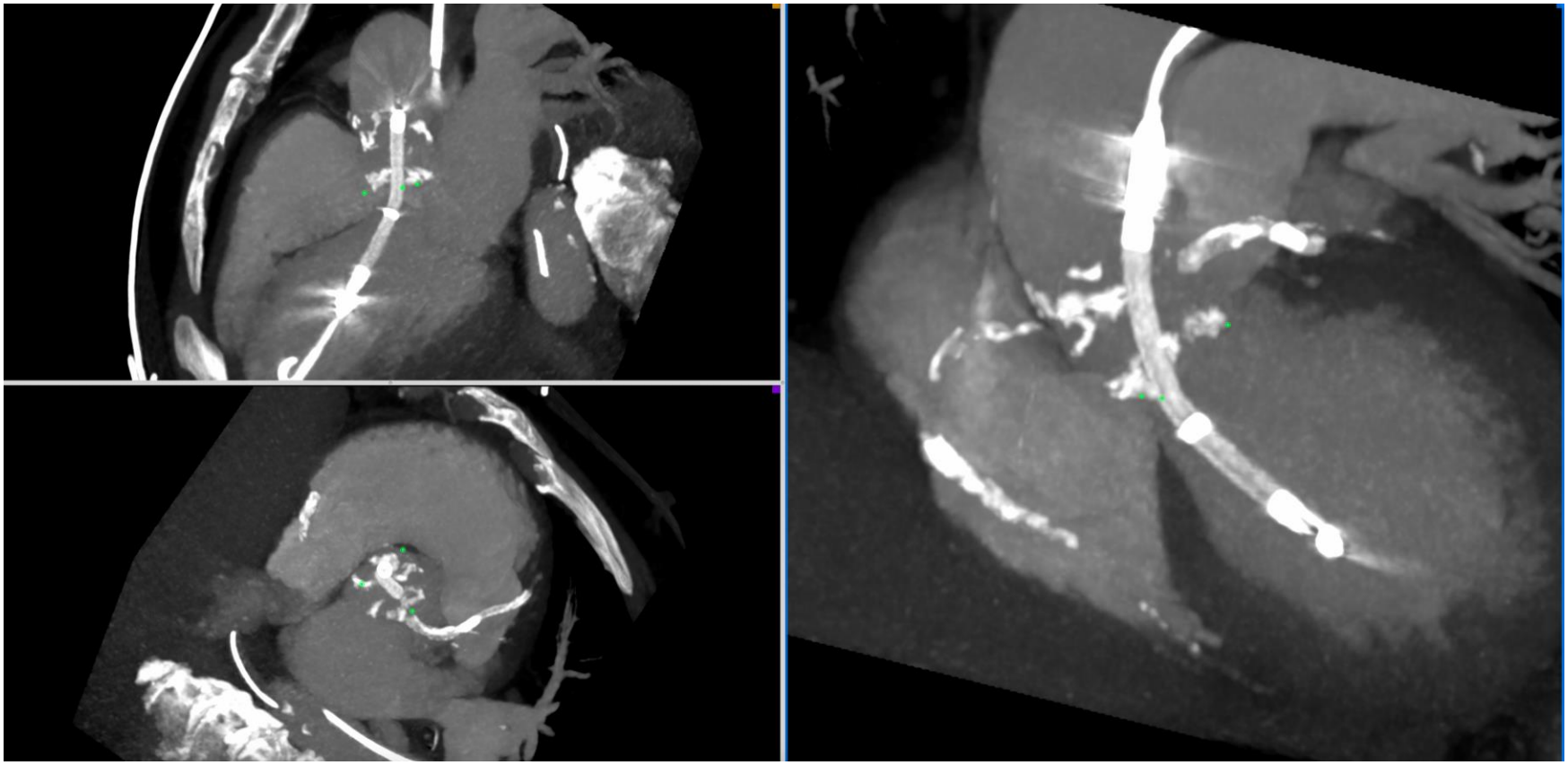
- Persistence of Cardiogenic Shock
- Upgrade of Mechanical Circulatory support was performed

- IABP removed and following Impella CP placement
- Impella positioned through stenotic aortic valve

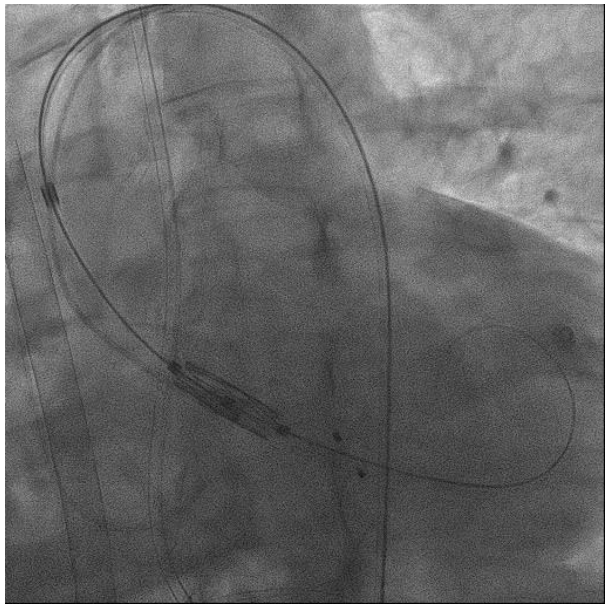
CT scan planning

- Prolonged Impella support
- 12° post procedural day: refractory cardiac arrest (Ventricular Tachycardia)
- Venous-arterial ECMO implanted
- TAVI procedure was planned with ECMO Support

Virtual Basal Ring
Perimeter = 86.4 mm
Area 585 mm^2

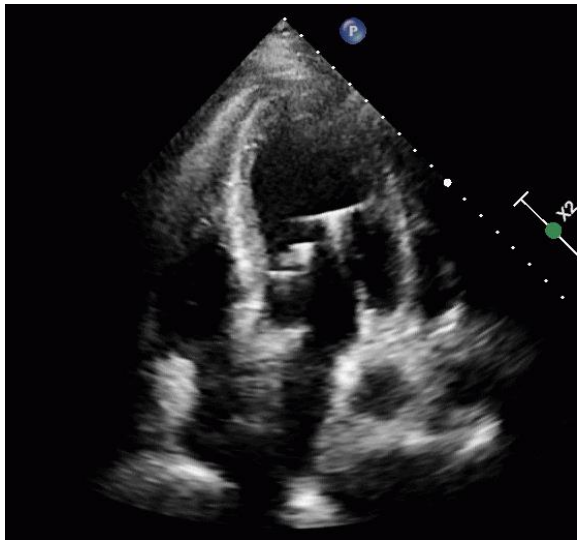


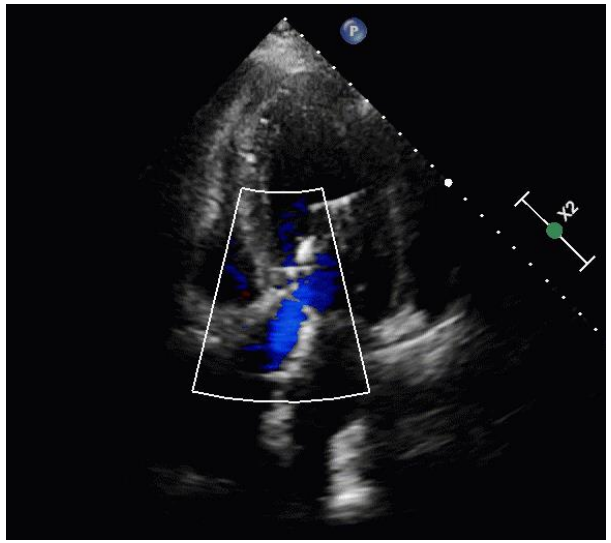
TAVI with ECPELLA support



- 0.018” wire advanced from Impella Sheath
- Baseline Aortography: moderate-severe aortic regurgitation
- **29 mm Balloon Expandable Myval implanted**

No Paravalvular leak; Mean gradient < 10 mmHg





Clinical Course

- Progressive haemodynamic stabilization
- Successful weaning from ECMO 2 days after TAVI

- Progressive improvement in Left Ventricular systolic function
- Prolonged hospitalization (Critical Illness Syndrome)

Conclusions

- Patients with Aortic Stenosis and cardiogenic shock require accurate management
  - Coexistence of coronary artery disease

- Impella support can be used:
  - To perform BAV
  - To perform PCI
  - As a bridge strategy to TAVR