

Introduction

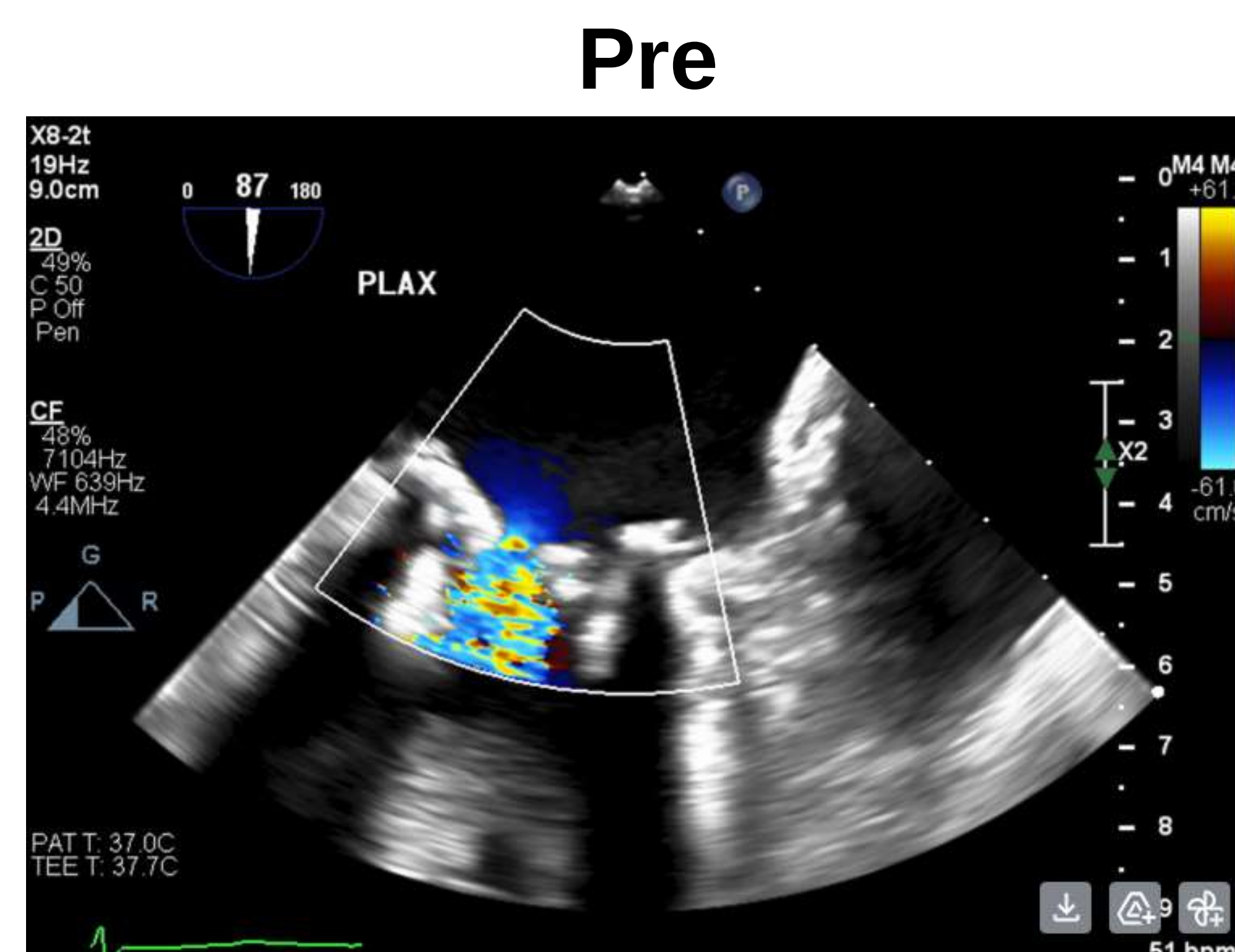
- Transcatheter mitral valve replacement (TMVR) offers a less invasive option for patients with failed surgical mitral bioprosthesis who are at high surgical risk for redo-sternotomy.
- Transcatheter aortic valves (TAVR valves) are used with high success for mitral valve-in-valve (ViV) and valve-in-ring (ViR) procedures.
- Balloon expandable valve is preferred
- Early registry and multicenter data demonstrate technical success rates above 90% short-term survival for transseptal TMVR with TAVR valves.

Case Description

- 78 year old female with PMHx of anemia, bronchitis, DM, CKD, CAD, s/p CABG/MVR, presenting with worsening dyspnea and chest pain
- TEE: severe bioprosthetic mitral stenosis, peak gradient 34 mmHg, mean gradient 24 mmHg
- deemed high-risk for redo-sternotomy
- scheduled for mitral ViV with reversed TAVR valve
- Induction: lidocaine, fentanyl, propofol, rocuronium
- pre-induction radial arterial line
- right IJ 6Fr central line with pacing wire guidance under fluoro
- required norepinephrine gtt
- Extubated with no neurologic sequelae

Case Course

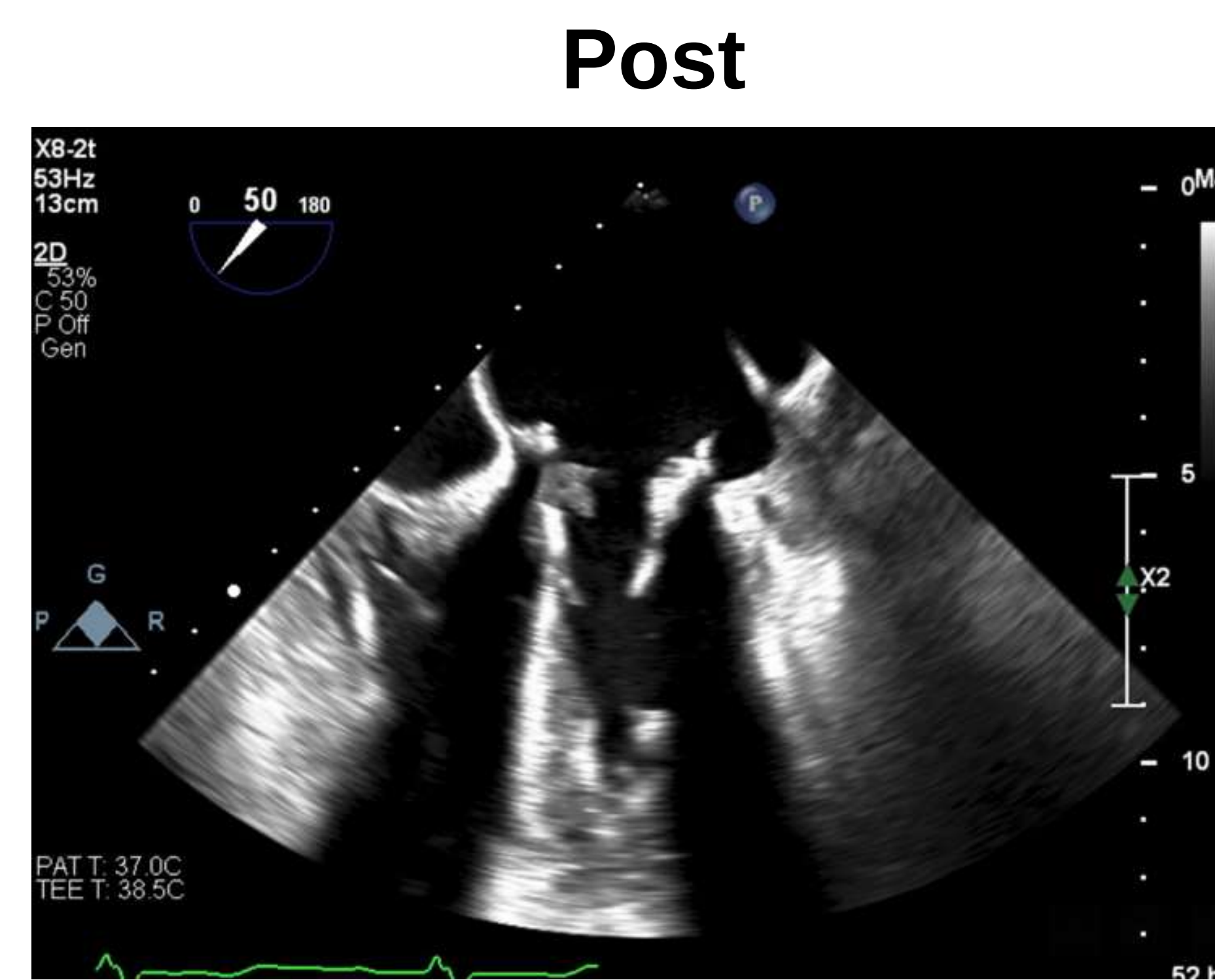
- Vasopressor support to treat hemodynamic instability
- TEE guidance to facilitate transseptal puncture, valve deployment and evaluation
- Temporary rapid ventricular pacing to stabilize deployment and optimize positioning of valve
- Post-op Echo: Mitral position: peak gradient 6 mmHg, mean gradient 2 mmHg, well-seated valve, no paravalvular leak, moderate TR, LVEF 55-60%. RV function normal, no aortic dissection, no pericardial effusion,



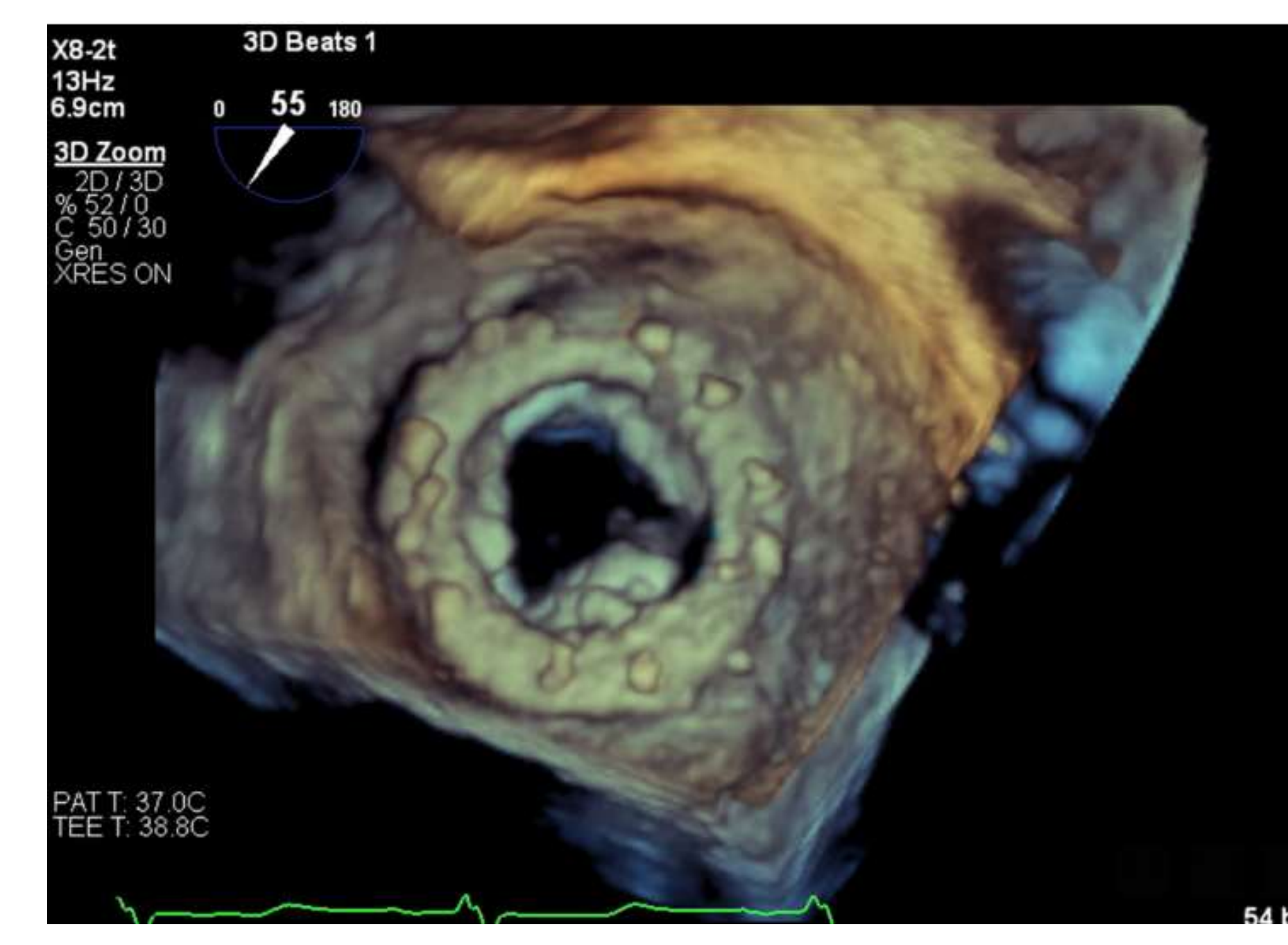
2D TEE: Color flow doppler demonstrating mitral stenosis



3D TEE: Demonstrating mitral stenosis



2D TEE: TMVR ViV



3D TEE: TMVR ViV

Discussion

- Structural degeneration of surgical mitral bioprosthesis with repeat open-heart surgery carries substantial risk in elderly, comorbid populations.
- TMVR ViV with a reversed balloon-expandable TAVR prosthesis offers a minimally invasive alternative and has demonstrated favorable outcomes in high risk populations despite its off-label status.
- Planning requires careful multimodality imaging (CT and TEE) for annular sizing and to predict left ventricular outflow tract (LVOT) obstruction.
- The cardiac anesthesiologist, in conjunction with the interventional cardiologist and cardiothoracic surgeon, plays a critical role in preoperative optimization, intraop management, and TEE guidance in order for a successful outcome in ViV TMVR

References

1. Whisenant B, et al. *One-Year Outcomes of Mitral Valve-in-Valve Using the SAPIEN 3 Transcatheter Heart Valve*. J Am Coll Cardiol. 2021;77(1):15-27.
2. Harloff MT, et al. *Step-by-Step Guide to Transseptal Mitral Valve-in-Valve Replacement*. Ann Cardiothorac Surg. 2021;10(5):592-600.
3. Guerrero M, et al. *Transseptal Transcatheter Mitral Valve Replacement: Lessons From the MITRAL Trial and TMVR Registry*. JACC Cardiovasc Interv. 2022;15(2):144-156.