

# Valve-in-Valve Trans Catheter Mitral Valve Replacement in a Patient with an In-Situ Valve and Tricuspid Ring

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## INTRODUCTION

Trans-catheter mitral valve replacement (TMVR) remains in its infancy when compared to trans-catheter aortic valve replacement (TAVR). At present, TMVR is most commonly performed in patients with degenerative native valve disease with annular rigidity due to mitral annular calcification (MAC) or patients with bioprosthetic valve degeneration (Valve-in-Valve (ViV) replacement).<sup>1</sup> Real-time, 3D TEE guidance is typically used in these cases.<sup>2</sup> We present a case of a challenging ViV TMVR, in which real-time 3D TEE was utilized.

## CASE REPORT

The patient is a 71 year old woman with a history of rheumatic fever complicated by mitral stenosis and atrial fibrillation who had previously undergone mitral valve repair and radio frequency ablation in 2006 followed by a mitral valve replacement (MVR), tricuspid valve repair and MAZE procedure in 2008. She subsequently underwent a TAVR in 2016 due to symptomatic severe aortic stenosis. In the ensuing years, she developed progressive shortness of breath and severe dyspnea on exertion, requiring home oxygen therapy. An echocardiogram demonstrated severe prosthetic mitral stenosis along with severe pulmonary hypertension with a PA systolic pressure of 115 mmHg.

Given her high risk for surgery, the decision was made to treat her with a ViV TMVR. After induction of general anesthesia (GA) and initiation of treatment with nitric oxide (NO) a trans-septal approach was initially attempted. Through 3D TEE imaging and guidance, a trans-septal approach was deemed to be both high-risk and technically challenging due to the previous trans-septal approach to her MVR along with significant intra-atrial septal wall calcification. The trans-apical approach to her MVR was subsequently pursued. Using 3D TEE guidance, a balloon-expandable bioprosthetic trans-catheter valve was positioned and successfully deployed. Post-procedural transvalvular gradients were 3mmHg along with trivial paravalvular regurgitation. Post-procedure, her PA systolic pressures had declined to 55mmHg. She was taken to the ICU intubated, the NO was weaned and she was extubated. She was discharged to home on POD #5.

## DISCUSSION

TEE guidance with 3D imaging was invaluable in this case. The use of TEE guidance in the trans-septal attempt resulted in the safest outcome for the patient, as it was determined that the septum could not be crossed in a safe location that would result in a successful deployment of the valve due to alteration of the septal anatomy by her previous surgical procedures. TEE guidance in the trans-apical attempt resulted in successful positioning and deployment of the valve.

## CONCLUSION

The use of TEE, and in particular 3D TEE, by skilled echocardiographers is essential to the success of TMR.

## REFERENCES

1. Krishnaswamy A. Mick S et al. Transcatheter mitral valve replacement: A frontier in cardiac intervention. *Cleveland Clinic Journal of Medicine*, 82(Sup 2), S10-17.
2. El Hajj S.C. and Mackram F.E. Transcatheter Mitral Valve Replacement: An Update on the Current Literature. *Current Treatment Options in Cardiovascular Medicine*, July 2019, 21:35.

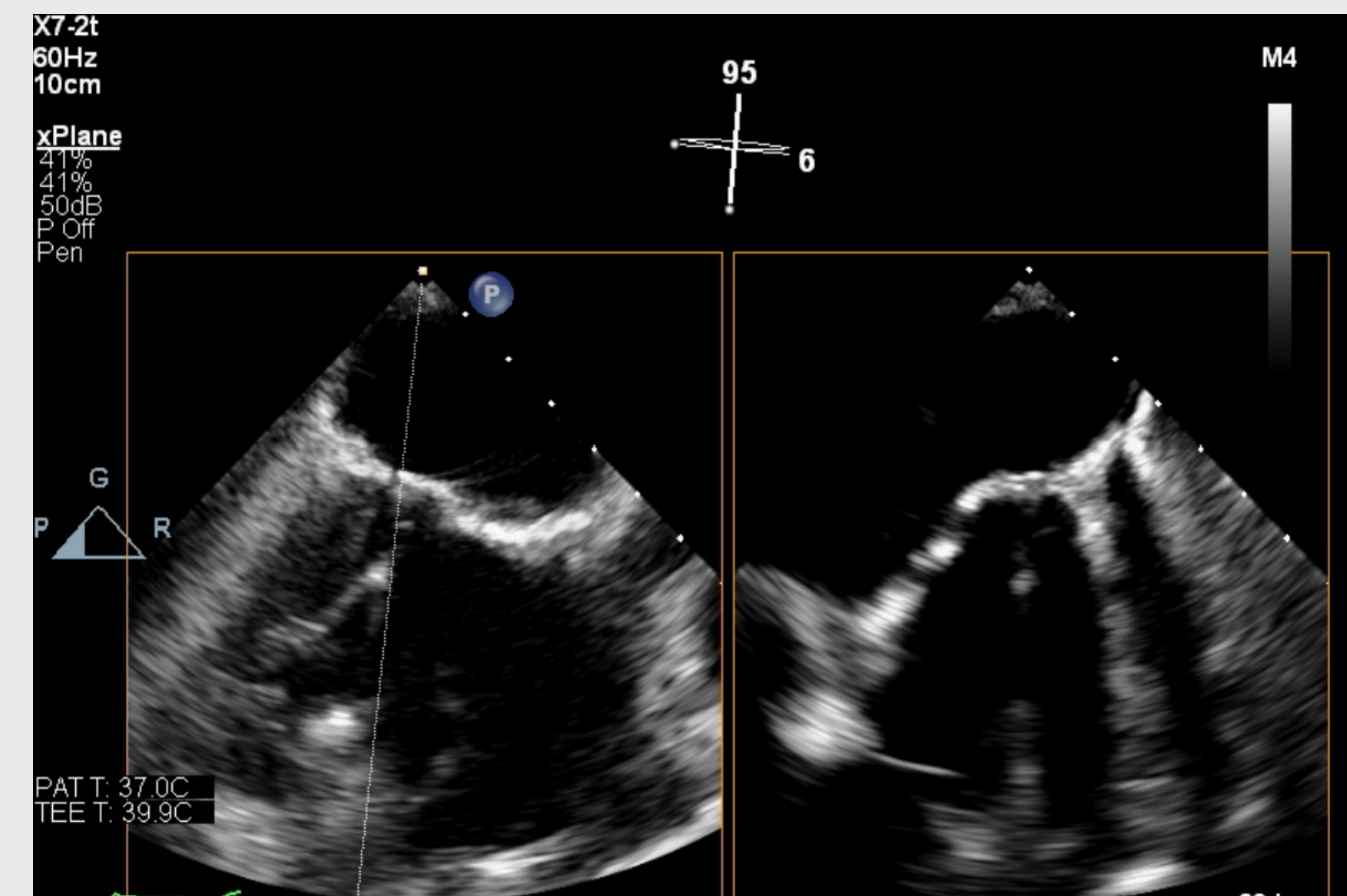


Figure 1 Trans-septal attempt

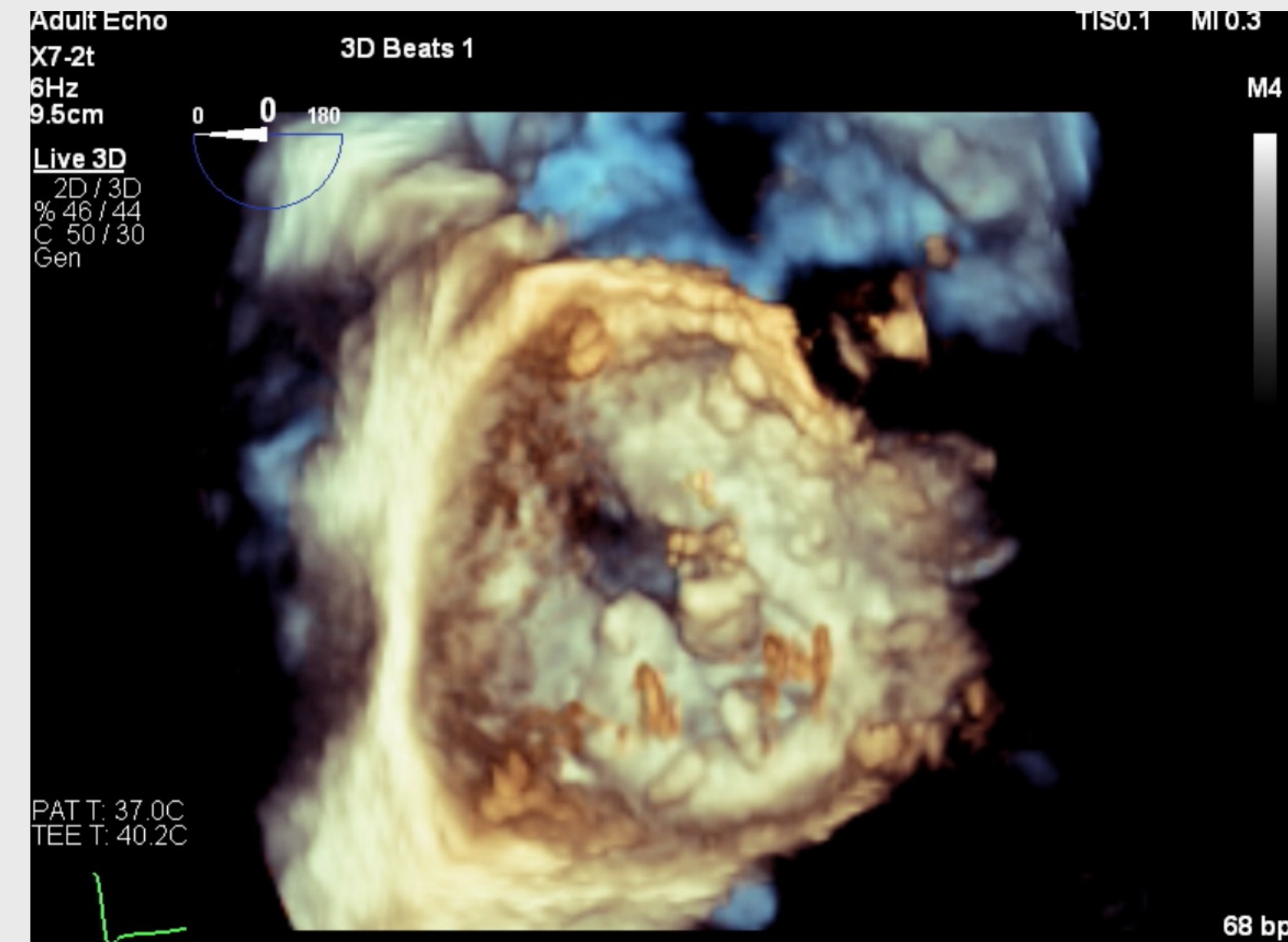


Figure 2 Wire through surgical mitral valve

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