



Paradoxical Emboli: An Uncommon but Clinically Significant Cause of Stroke



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INTRODUCTION

- Cerebrovascular embolic ischemic strokes are responsible for ~139,000 deaths annually in the United States
- 40% of strokes have no inciting cause found on diagnostic workup and are termed cryptogenic
- Most common cause of cryptogenic stroke is paradoxical embolism (PDE) – passage of VTE into the arterial system by way of intra-cardiac or pulmonary vascular defect

DISCUSSION

- The prevalence and incidence of paradoxical embolism is unknown
- Most common etiology of PDE is a DVT originating from the lower extremities
- Dislodged thrombi migrate through the venous system into the heart and can embolize into the pulmonary vasculature or in the presence of a right-to-left shunt, directly enter the arterial system
- Intra-cardiac shunt can take the form of PFO, ASD, VSD, or PAVM
- Incidence of PFOs – two times higher in patients with cryptogenic stroke
- Diagnosis – Echocardiography, coagulation studies
- Treatment – lifelong coagulation, surgical correction of shunt

CONCLUSIONS

- The prevalence and incidence of paradoxical embolism is unknown
- PFO is hypothesized to be the most common contributing factor the development of PDE
- High index of suspicion must be maintained to ensure timely diagnosis and treatment of patients presenting with cryptogenic stroke

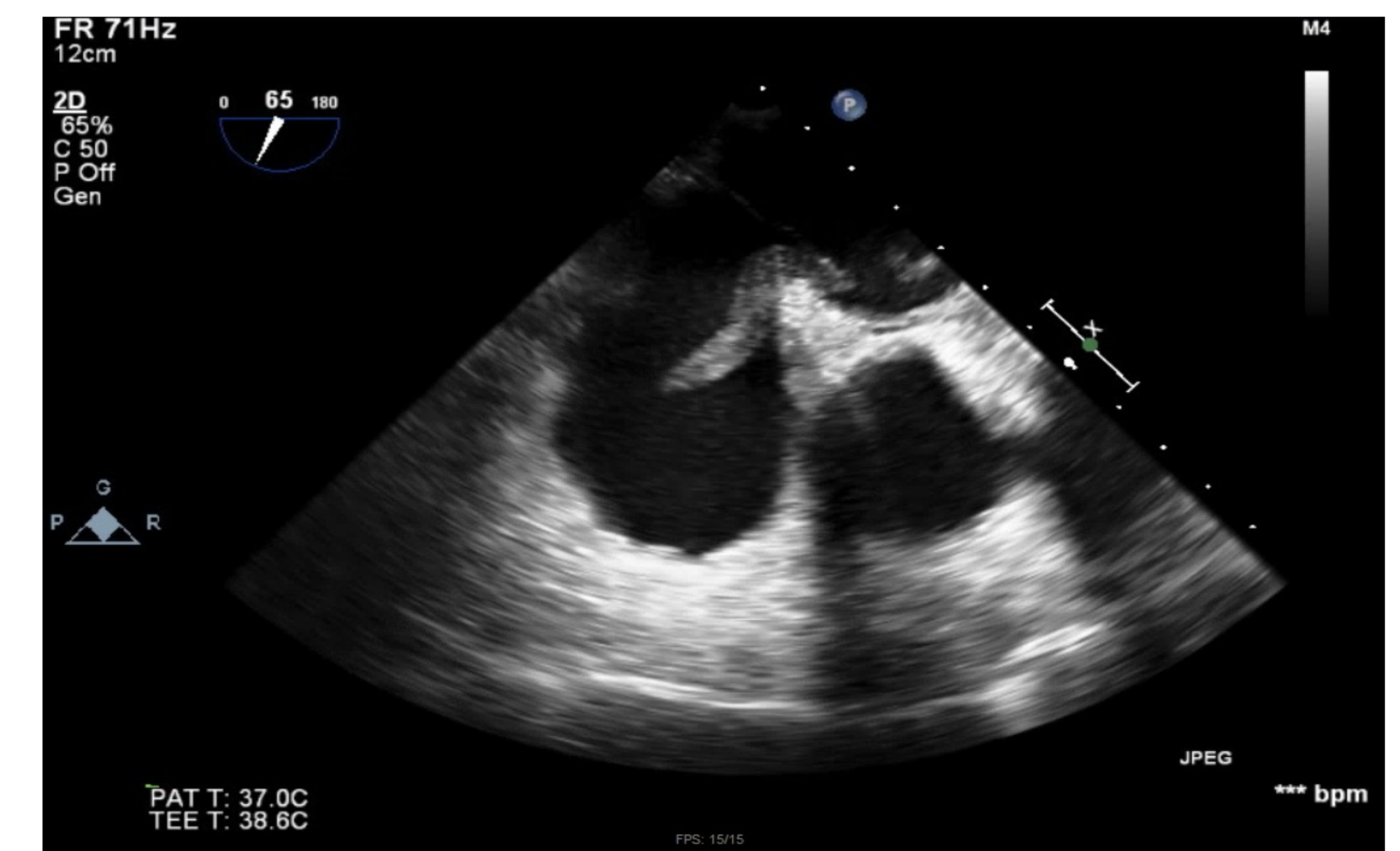
CASE REPORT

Case I

- 87-year-old male presented for evaluation of chest pain
- PMH of HTN, PVD, CAD
- 3-vessel CABG performed with placement of IABP for left ventricular support (removed POD#2)
- POD#12 – patient became hemodynamically unstable with hypercapnia and required intubation
- TTE/TEE demonstrated evidence of bi-atrial thrombus traversing a PFO
- Emergently taken to the OR for intra-atrial thrombectomy – no thrombus found at time of surgery, PFO closed
- Patient experienced an acute left hemispheric stroke post-operatively, likely due to the clot seen pre-operatively traversing PFO
- Discharged to rehabilitation facility on HD#66

Case II

- 63-year-old female presented with dizziness and left upper extremity numbness approximately 2 hours in duration
- PMH of HTN, MS, HLD
- MRI Head – acute ischemic infarct of the R. MCA, occlusion of R. ICA
- CTA Neck/Chest on HD#1 – large saddle pulmonary embolus and extensive thrombi in bilateral common carotid, right vertebral, and innominate arteries
- Emergency mechanical thrombectomy – removed bulk of embolism
- TTE performed and demonstrated patent foramen ovale (PFO)
- Hypercoagulability workup showed evidence of protein S deficiency
- Discharged HD#32 to rehabilitation facility on oral anticoagulation



Figures I– TEE showing presence of bi-atrial thrombus

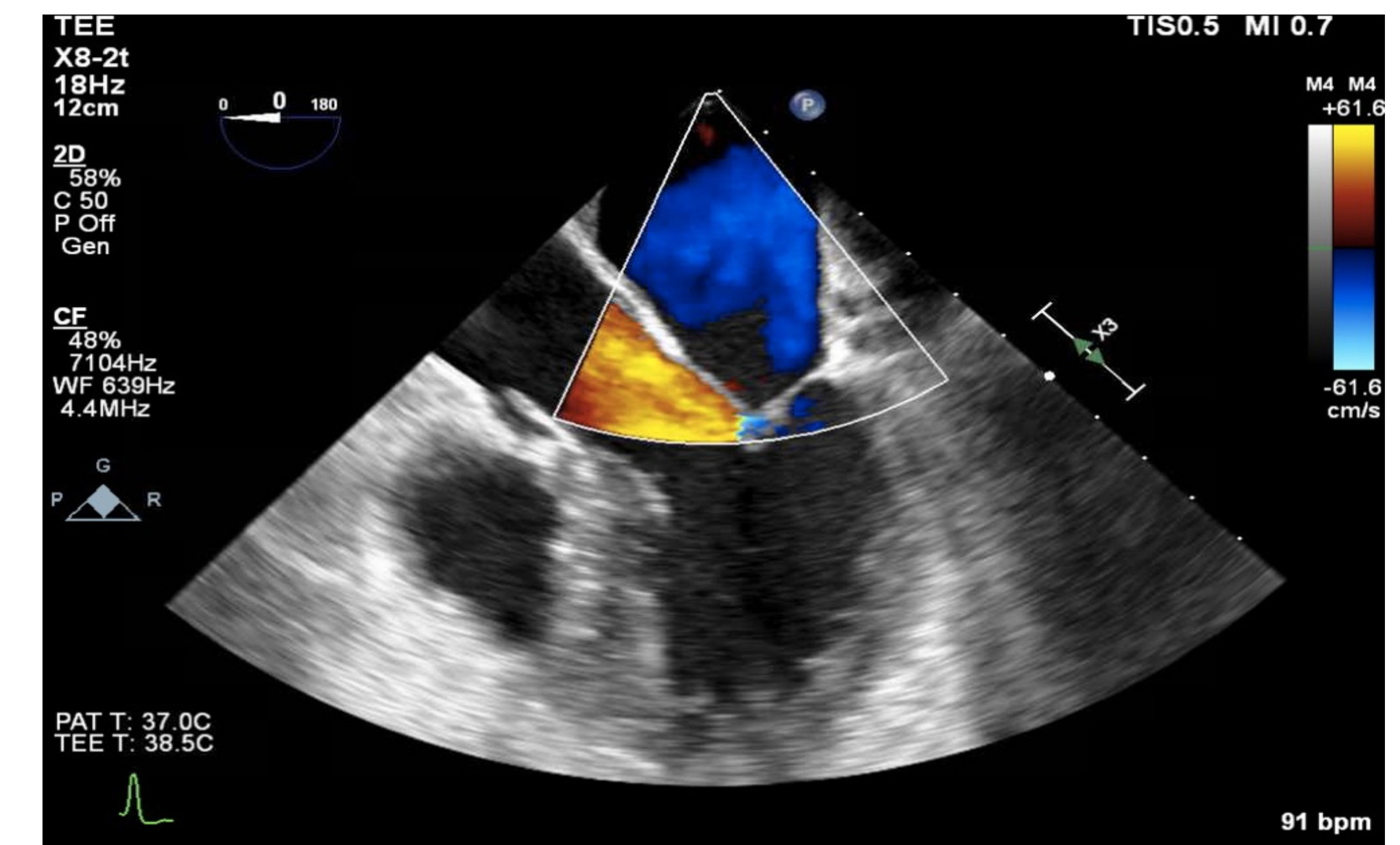


Figure II – TTE showing evidence of PFO

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