

Underestimation of PFO Size With Saline Contrast

Rana Zouveenoor Tariq M.D, Sherif Labib M.D
Lahey Hospital & Medical Center, Burlington MA

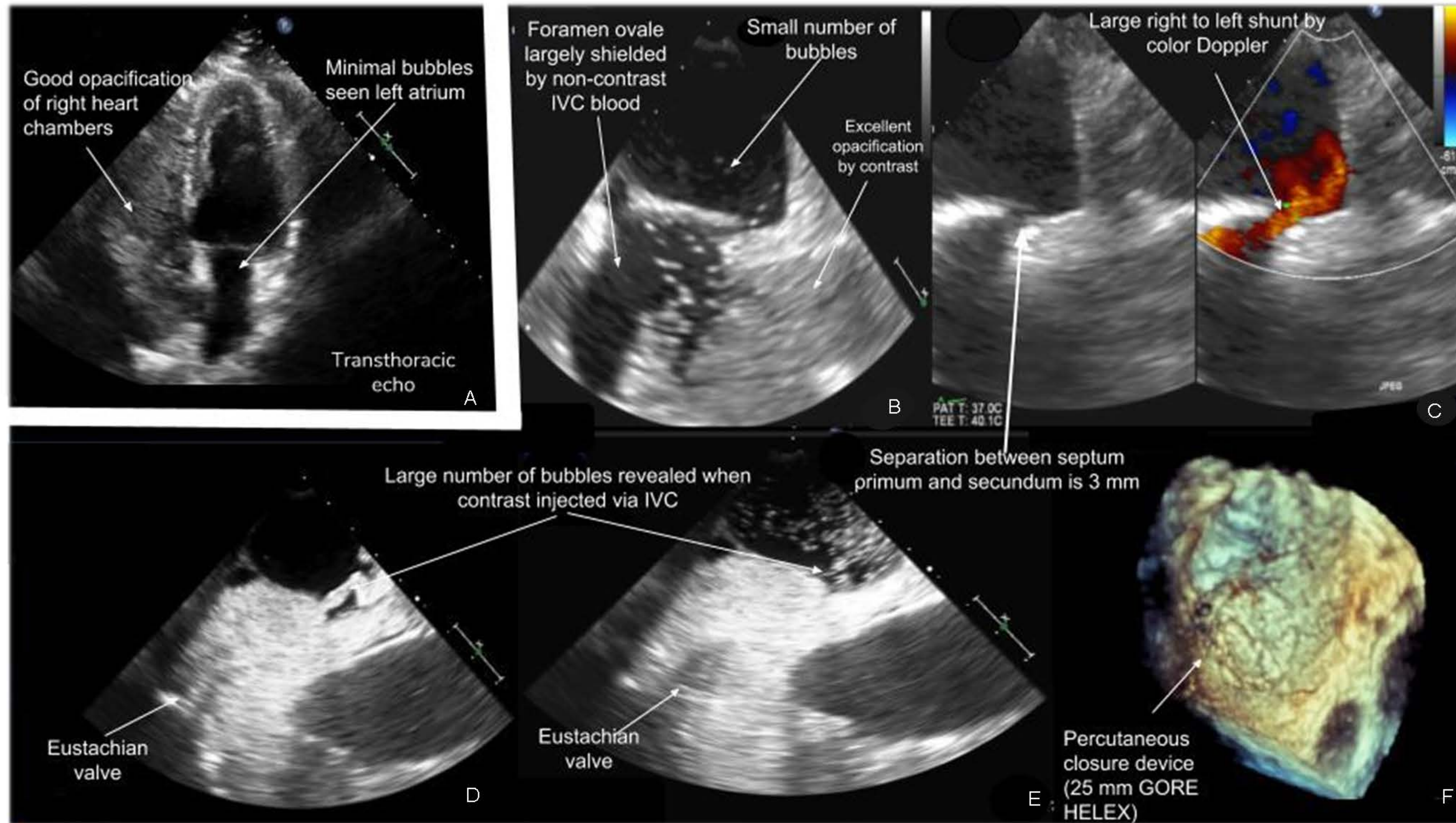
Background

- Right to left shunt via a patent foramen ovale (PFO) can cause paradoxical embolism and hypoxia when significantly large.
- PFO and shunting is typically detected and graded using saline contrast (SC) from a peripheral vein.
- We present a case where significant right to left shunting was suspected but underestimated when SC was injected from a cubital vein visualized by Transthoracic echo (TTE) and Transesophageal echo (TEE).

Case

- A 69 year old female presented with unexplained dyspnea and hypoxia (O₂ sat. 88%).
- Transthoracic echo (TTE) with SC showed only a small number of micro bubbles in the left atrium (LA) (Image A). Right ventricular function and Pulmonary pressure were noted within normal limits.

Images



Conclusion

- The magnitude of right to left shunting across a PFO, which can be large enough to cause hypoxia, can be underestimated with TTE or TEE using conventional SC techniques in some patients.
- Recognition of the shielding effect created by a prominent EV is vital in identifying such patients. Who would otherwise have reduced sensitivity for detection of a large PFO.
- Alternative methods such as color Doppler grading of shunt flow and SC from IVC should be used when this problem is suspected in order to properly recognize the presence and degree of shunting.

Decision Making

- Due to high clinical suspicion TEE with SC was pursued. It achieved excellent opacification of the superior vena cava (SVC) and superior aspect of right atrium (RA) using a cubital vein. (Image B)
- Only a small number of micro bubbles were noted in LA. Importantly the RA side of the foramen ovale was shielded by the streaming effect of inferior vena cava (IVC) non-contrast blood (Image B) directed by a prominent Eustachian valve (EV).
- Color Doppler indicated the presence of large PFO that measured 3 mm in diameter. (Image C)
- The patient was referred for percutaneous PFO closure preceded by confirmation of a large PFO by SC injection from the IVC. (Image D, E)
- This revealed far greater number of micro bubbles in the left atrium. (Image D, E)
- There was immediate resolution of hypoxia after device deployment (Image F).