# The Imaging of Patent Foramen Ovale Using Contrast Real Time Three Dimensional Echocardiography

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# Conflict of interest

- No potential conflict of interest declared

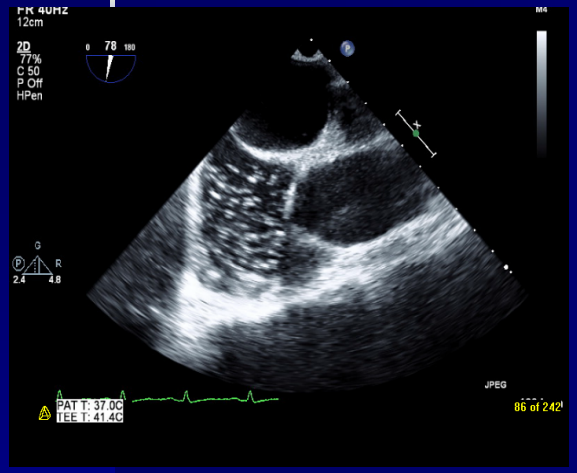
# Background and Purpose

- The presence of PFO is a potential cause of paradoxical embolus and in particular of cerebral emboli in stroke of unknown origin.
- Transthoracic and or Transesophageal Contrast Echocardiography (TEE) are the methods of detection of patent foramen ovale.
- However, real time three dimentional contrast transesophageal echocardiography (RT3D CTEE) has an advantage for the purpose of the diagnosis of small PFO.
- It also allows direct visualization of the entire fossa ovalis and surrounding structures with more accurate diagnosis of PFO by directly visualizing the bubbles crossing the fossa ovalis.

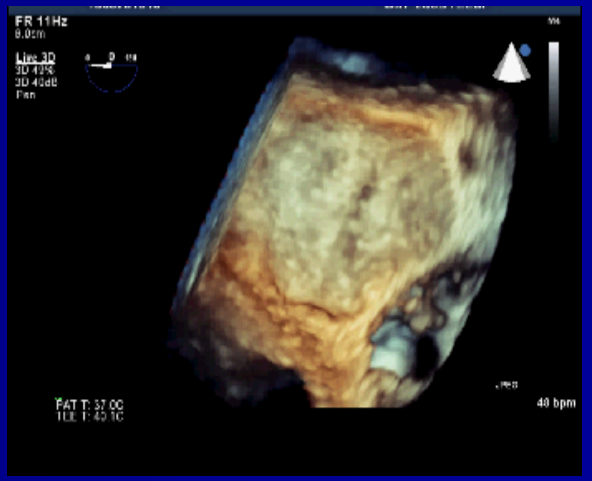
# Methods and Results

- We examined 121 consecutive patients referred for TEE post stroke, using the Philips iE33 ultrasound system.
- Agitated saline contrast was performed during 2DTEE and 3DTEE.
- The diagnosis of PFO was obtained in 25 patients. In 3 of them the bubbles were visualized only on 3DRTTEE.
- High quality 3D images suggested that 3DTEE is feasible and provided detailed description of the atrial septum anatomy and PFO anatomy.

# Real time 3DTEE en face view of the fossa ovalis from the left atrium show bubles directly entering the left atrium from the right atrium through the septal separation in the fossa ovalis.







# Conclusion

- The 3DTEE is more sensitive to detect PFO without a need for repeated contrast injection or Valsalva maneuver. It also allows a high degree of certainty in differentiating intracardiac from extracardiac shunts.