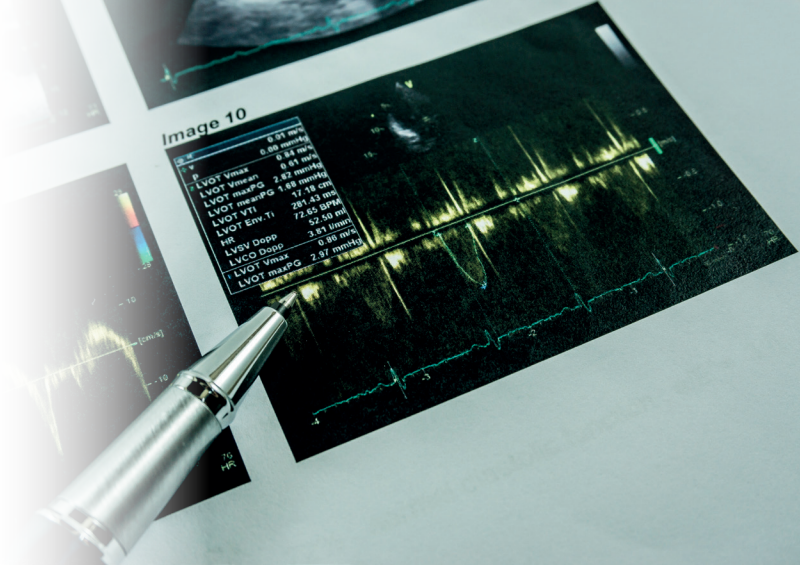


CVS

Cardio Vascular Services

Case Study – The importance of diligence in transthoracic echo



Patient Susan – unexplained TIAs

1. Patient presentation

- Susan was a 45 year old female with a history of multiple recent transient ischaemic attacks (TIAs) causing blackouts and short term memory loss. She also had a diagnosis of antiphospholipid syndrome which was being treated conservatively by her GP

2. Diagnosis

- GP referred Susan for a transthoracic echocardiogram (TTE) with us on 29th April, 2019 which demonstrated probable patent foramen ovale (PFO) by saline contrast and recommended further cardiac evaluation.
- Susan subsequently had another episode, which led her to a public hospital for a transoesophageal echocardiogram (TOE), which did not demonstrate a PFO. Patient discharged with no further treatment recommendations.
- Susan contacted us to query the different diagnosis between the CVS TTE and the subsequent public hospital TOE.
- CVS performed a repeat saline contrast study on 27/06/2019 and clearly demonstrated a PFO by saline contrast.
- There were clear technical issues (deficiencies) with the TOE performed at the public hospital, leading to an incorrect diagnosis.

3. Treatment and Outcome

- Given the quality of the TTE performed by CVS, we were able to identify and confirm a PFO, and then action the appropriate course of treatment and follow up
- Susan was seen by Dr Philip Currie for cardiology consult and referred to Dr Ross Baker (hematologist) to investigate significance of antiphospholipid syndrome in contributing to the TIA, and whether closure of the PFO (using Amplatzer device) was clinically indicated.
- Susan subsequently had the PFO closed using Amplatzer device by Dr Richard Clugston, follow up echo on the same day demonstrated successful closure with no significant shunting across the PFO.

4. Conclusion

Despite a TOE being of higher diagnostic quality than a TTE, if done poorly/incorrectly, it can still lead to an incorrect diagnosis. The completeness of our TTE protocol ensures that we obtained a correct diagnosis of this condition

Differing echocardiogram reports on patient 'Susan'

1. Public hospital transesophageal echo
2. CVS transthoracic saline contrast echo

1. Hospital TOE Report 24 May 2019

Conclusions

1. Normal appearance of LA/LAA. No evidence of thrombus or other pathology. Interatrial septum appears intact, no aneurism identified with no evidence of PFO on color Doppler. After multiple attempts of agitated saline study and Valsalva late presence of few bubbles identified. All 4 pulmonary veins identified with normal drainage.
2. Normal left and right ventricular size and function
3. Normal valvular appearance and function

2. Subsequent CVS Transthoracic Saline Echo Report 27 June 2019

Conclusion

There is a **definite patent foramen ovale (PFO) detected by contrast echo, confirmed with use of both Valsalva and Müller's maneuvers**. This repeat contrast echo study was performed to further confirm the presence of patent foramen ovale with serial contrast echos and **technically very effective Valsalva and Müller's maneuvers as the patient has had a transoesophageal echo which did not show a PFO but this was performed with a sedated patient and the right to left atrial shunting was only demonstrated with effective maneuvers**.

The echo findings include **normal LV systolic function**, LVEF 65% (normal function 54-74%) with **no resting regional wall motion abnormalities, no LV hypertrophy, normal atrial size, normal estimated PA systolic pressure, normal RV systolic function** and a **patent foramen ovale**.

Given the patient has a diagnosis of antiphospholipid syndrome and does have a patent foramen ovale, would recommend **formal haematological consultation with Dr Ross Baker as the next step**. The patient states that formal haematological assessment of her thrombophilia (antiphospholipid syndrome) has not previously been done and this would significantly help to the determination of her optimal management [full anticoagulation (warfarin vs NOAC drug) or antiplatelet agents and the appropriateness of Amplatzer PFO closure to prevent paradoxical embolism]. Please call **Dr Philip Currie on 1300 887 997 if clarification of these findings is necessary or to expedite clinical management**.

Sinus bradycardia, rate 54bpm.

1. The **left ventricle is normal size**. LVEDD 46mm and LVEDD index 26mm/m² (normal cavity size 23-31mm/m²) with **normal LV systolic function**. The **calculated LV ejection fraction is 65%** (Simpson's biplane 2D method). There are no resting regional wall motion abnormalities. There is **no LV hypertrophy** with a normal estimated LV mass index of 60gm/m² (normal <96gm/m²). There is no Doppler evidence of LV diastolic dysfunction (septal E' of 10cm/sec and E/E' of 8).
2. The atria are normal size. The apical atrial volumes are LA: 28mL/m² and RA: 23mL/m². There is a **type 1R atrial septal aneurysm** with a **patent foramen ovale** detected. There is **right to left shunting** demonstrated with contrast echo by injection of agitated saline from a left antecubital vein. There is minimal shunting at rest, with **increased shunting in the release phase of serial Valsalva maneuver and Müller's maneuver** (only partial left heart contrast opacification).
3. The aortic valve is trileaflet and normal. There is trivial aortic regurgitation.
4. The mitral valve is normal. There is trivial mitral regurgitation.
5. There is **normal estimated PA systolic pressure** of 30mmHg (assuming RA pressure of 5mmHg). The **right ventricle is normal size** with **normal RV systolic function**. The tricuspid and pulmonary valves are normal. There is trivial tricuspid regurgitation.
6. There are no intracardiac masses or pericardial effusion detected.