Paradoxical embolism via a patent foramen ovale

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DESCRIPTION

A 32-year-old man recently had a right-sided hemiparesis; a head CT scan revealed left middle cerebral artery (MCA) territory infarct. The patient was haemodynamically stable, with no clinical evidence of deep venous thrombosis (DVT) and was referred for cardiac evaluation. The patient's routine workup including carotid Doppler was normal. ECG showed normal sinus rhythm.

Two-dimensional transthoracic echocardiography (figures 1 and 2) performed revealed a thrombus attached to the interatrial septum (IAS) prolapsing into the right ventricle through the tricuspid valve and traversing into the left atrium through a foramen ovale and prolapsing into the left ventricle. A soft clot (figure 3) was also identified into the main pulmonary artery. Doppler performed after echocardiography revealed DVT involving the right popliteal vein and common iliac vein. Thus, this patient had an intracardiac thrombus, evidence of pulmonary thromboembolism, left MCA territory infarct and Doppler evidence of DVT. Procoagulant workup was suggestive of protein C deficiency. The patient was managed with unfractionated heparin and oral anticoagulants. As surgery being the first line of management for large intracardiac thrombus, the patient's attendants were given the option of surgical management but because of financial issues and also the patient started showing clinical improvement on medical treatment, they opted for continuing medical management. There was no evidence of residual thrombus on repeat echocardiography (figure 4) performed after 1 month.

Figure 2 Thrombus seen attached to the interatrial septum IAS (both side) and seen prolapsing into the right ventricle through the tricuspid valve and into the left ventricle through the mitral valve.

Patent foramen ovale (PFO) has been reported to be present in approximately 30% of patients with ischaemic strokes.¹ Several studies have suggested PFO as a significant risk factor for cryptogenic strokes.^{2 3} The mechanism underlying this phenomenon is postulated to be secondary to paradoxical embolism. This case clearly demonstrated paradoxical embolism through a PFO as a mechanism of ischaemic stroke with evidence of cerebral embolism without a left-sided source, presence of pulmonary embolus and demonstration of a right-to-left shunt. In a meta-analysis³ of nine case-control studies involving 566 patients and 458 non-stroke controls, young patients with a stroke had an OR of 3.1 for having a PFO.

Figure 1 Echo-A4CV thrombus seen attached to the interatrial septum (both side) and seen prolapsing into the right ventricle through the tricuspid valve and into the left ventricle through the mitral valve.

Figure 3 ECHO-PSAX showing soft clot in main pulmonary artery.

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Figure 4 Echo-A4CV post-treatment no evidence of residual thrombus.

Competing interests None.

Patient consent Obtained.

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Learning points

- ▶ The importance of investigating the existence of a patent foramen ovale (PFO) particularly in patients presenting with deep venous thrombosis (DVT) and stroke.
- ▶ Multiple sites of thromboembolic events (intracardiac, pulmonary thromboembolism and stroke due to paradoxical embolism via PFO) in single patients with Doppler evidence of DVT.
- ▶ This case highlights the importance of procoagulant workup in young patients with stroke.
- ▶ Heparin is effective as a non-invasive treatment for large thrombi, but due to its high risk of embolisation, surgery is the first line of therapy.

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