

Large thrombus entrapped in a patent foramen ovale complicated by stroke and pulmonary embolism

Urszula A. Szymańska¹, Marek Rosiak^{1,2}, Joanna Rozbicka¹, Dariusz A. Kosior^{1,3}

¹ Department of Cardiology and Arterial Hypertension, Central Clinical Hospital, Ministry of the Interior, Warsaw, Poland

² Department of Experimental and Clinical Pharmacology, Medical University of Warsaw, Poland

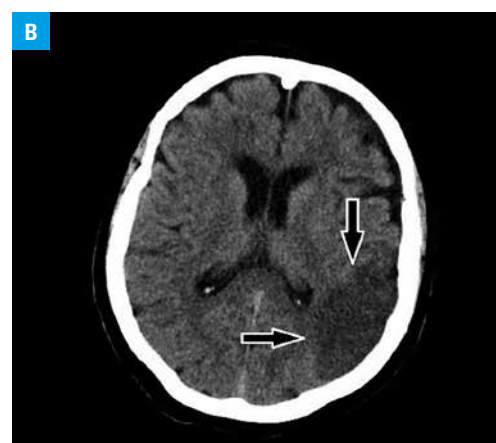
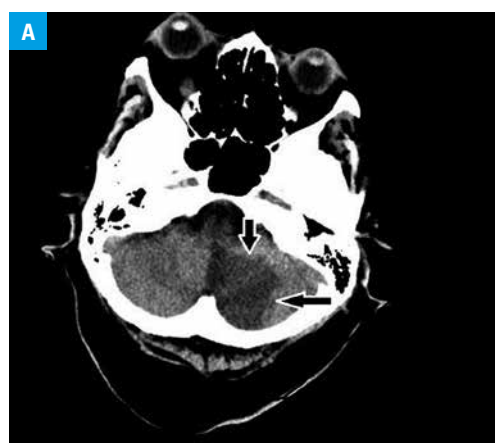
³ Department of Applied Physiology, Mossakowski Medical Research Centre, Polish Academy of Sciences, Warsaw, Poland

Patent foramen ovale (PFO) is an increasingly studied cause of paradoxical embolism, which may lead to cryptogenic stroke. Owing to its transient nature, it is virtually impossible to identify the embolus at the time of clinical presentation. Echocardiography and other noninvasive imaging modalities remain the basic diagnostic tools in this condition. Because of its rarity, the management of PFO-trapped thrombi has not been well established so far. We report a very rare case of a large thrombus entrapped in PFO complicated by pulmonary embolism and ischemic stroke, successfully treated noninvasively.

A 69-year-old extremely obese woman presented at the Department of Neurology with a 1-day history of aphasia, shortness of breath, unspecified chest pain, and dyspnea. A physical examination at baseline revealed mixed sensorimotor aphasia, right Babinski sign, heart rate of 66 bpm, blood pressure of 150/80 mmHg, and oxygen saturation of 96% without oxygen supplementation. A computed tomography (CT) scan showed acute stroke of the left half of the cerebellum and

parietal-temporal-occipital region of the left brain hemisphere (FIGURE 1A). Transthoracic echocardiography (TTE) demonstrated dilated right heart cavities with right ventricular hypokinesis, elevated arterial pulmonary pressure of 51 mmHg, and a floating echogenic mass of 10 × 40 mm in the right atrium (RA). Transesophageal echocardiography (TEE) revealed a large 55-mm long thrombus in the RA passing through PFO to the left atrium and partly moving during contraction to the left ventricle (FIGURE 1C–F). Owing to a very high probability of pulmonary embolism (PE) on TTE and TEE, we decided not to perform CT pulmonary angiography. Because the patient did not agree to surgical thrombectomy, a treatment with enoxaparine was started. After 11 days of therapy with low-molecular-weight heparin, control TEE revealed no thrombus in heart cavities (FIGURE 1D). The patient was scheduled for percutaneous closure of the PFO and discharged after the procedure on the 22nd day of hospitalization.

A thrombus trapped in the PFO is a very rare finding, mainly manifesting with paradoxical



Correspondence to:
Marek Rosiak, MD, PhD, Klinika
Kardiologii i Nadciśnienia Tętniczego,
Centralny Szpital Kliniczny
Ministerstwa Spraw Wewnętrznych,
ul. Wołoska 137, 02-507 Warszawa,
Poland, phone: +48 22 508 16 70,
fax: +48 22 508 16 80, e-mail:
marek.rosiak@gmail.com
Received: July 20, 2015.
Revision accepted: July 20, 2015.
Published online: July 22, 2015.
Conflict of interest: none declared.
Pol Arch Med Wewn. 2015;
125 (9): 690-691
Copyright by Medycyna Praktyczna,
Kraków 2015

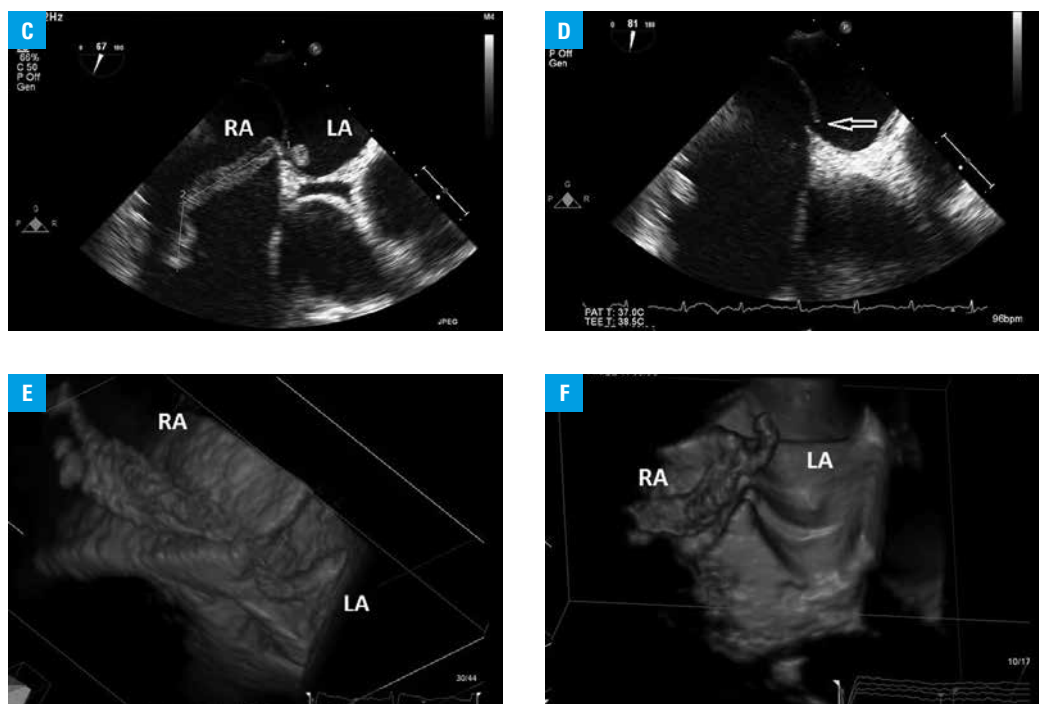


FIGURE 1 **A, B** – a computed tomography scan revealing ischemic stroke in the left half of cerebellum and temporal-occipital-parietal borderline of the left hemisphere of the brain (arrows); **C** – 2-dimensional transesophageal echocardiography (TEE) revealing a 55-mm long thrombus visible in the right atrium (RA) trapped in a patent foramen ovale (PFO), which prolapsed into the left atrium; **D** – control 2-dimensional TEE performed 11 days later revealing the PFO (arrow) with no sign of thrombus; **E, F** – 3-dimensional TEE revealing a large thrombus in the RA and LA entrapped in the PFO

embolism. The mean percentage of cryptogenic strokes among ischemic strokes is 31%, of which one-third may be associated with PFO.¹ There are a few options for medical treatment of a thrombus trapped in a PFO, including surgical thrombectomy, thrombolysis, and anticoagulation therapy. According to Fauveau et al,² surgery is the most common first-line treatment, and thrombolysis is generally performed in unstable patients with severe PE. Anticoagulation therapy appears to be an acceptable alternative treatment, especially in patients with comorbidities or stroke.² In 2010, Myers et al³ found no factors predictive of mortality, although patients treated surgically were at a lower risk of systemic embolism and a combined endpoint consisting of death and systemic embolism compared with those treated with fibrinolysis (odds ratio [OR], 0.13; 95% confidence interval [CI]: 0.03–0.67; $P = 0.02$, and OR, 0.26; 95% CI: 0.11–0.60; $P = 0.001$; respectively).³ Ferreira et al⁴ presented a case of a male patient with paradoxical stroke and pulmonary embolism with 2 thrombi, one on the lateral wall of RA and the other passing through a PFO, revealed by TEE. After 7 days of treatment with heparin, the thrombus in the PFO resolved completely, while the other remained unchanged.⁴

To the best of our knowledge, the presented case is the first one to show a complete resolution of a thrombus on anticoagulation treatment.

REFERENCES

- 1 Meier B, Lock JE. Contemporary management of patent foramen ovale. *Circulation*. 2003; 107: 5-9.
- 2 Fauveau E, Cohen A, Bonnet N, et al. Surgical or medical treatment for thrombus straddling the patent foramen ovale: Impending paradoxical embolism? Report of four clinical cases and literature review. *Arch Cardiovasc Dis* 2008; 101: 637-644.
- 3 Myers PO, Bounameaux H, Panos A, et al. Impending Paradoxical Embolism. Systematic Review of Prognostic Factors and Treatment. *Chest*. 2010; 137: 164-170.
- 4 Ferreira FG, Costa S, Gonçalves A, et al. Thrombus through a patent foramen ovale: a direct cause of cardioembolic stroke and pulmonary embolism. *Rev Port Cardiol*. 2012; 31: 625-626.