

Large Biatrial Thrombembolus Caught in Transit across a Patent Foramen Ovale

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Abstract

Keywords

- ▶ cardiovascular surgery
- ▶ congenital heart disease
- ▶ echocardiography
- ▶ heart valve surgery
- ▶ pulmonary embolism

Background In rare cases of pulmonary embolism, large thrombemboli have been found entrapped in a patent foramen ovale (PFO).

Case Description A patient was referred to our center with leg swelling and dyspnea. Electrocardiogram showed sinus tachycardia and right axis deviation. Echocardiography revealed a highly mobile biatrial thrombus entrapped in a PFO extending to both tricuspid and mitral valves and prolapsing into the left ventricle. Urgent surgery for cardiac thrombectomy and PFO closure was performed. Intraoperatively, massive coherent thrombus material was extracted.

Conclusion Because of a lack of data, decision making has to rely on clinical judgment rather than evidence.

Introduction

Most frequently, pulmonary embolism (PE) is caused by thrombi originating from deep vein thrombosis (DVT). Massive PE can lead to acute right heart failure and requires urgent medical attention. In the presence of a patent foramen ovale (PFO), paradoxical systemic embolization can occur, especially when pulmonary arterial and right atrial pressures are acutely elevated. In rare cases, large thrombemboli have been found entrapped in a PFO. Because of the rarity of this entity, optimal treatment strategies have not been defined and most clinical evidence stems from case reports or observational studies with limited patient numbers.

Case Description

A 48-year-old male patient was referred to our center with acute unilateral leg swelling and intermittent dyspnea with a diagnosis of PE from right-sided DVT. On admission, arterial oxygen tension was 89%, carbon dioxide tension was 49% with a base excess of -1.2 mmol/L. Electrocardiogram showed sinus tachycardia and right axis deviation. Transesophageal echocardiography revealed a highly mobile, huge biatrial thrombus entrapped in a PFO extending to both tricuspid and mitral valves and

prolapsing into the left ventricle (▶**Video 1**). Cardiac function was found to be almost normal with only mild right ventricular dilatation. Given size and mobility of the thrombus, urgent surgery for cardiac thrombectomy, and PFO closure was planned. After median sternotomy, cardiopulmonary bypass was established via standard bicaval and aortic cannulation. Thrombectomy was performed via right atriotomy and transeptal access to the left atrium. In a second step, thrombotic material was extracted from both pulmonary arteries. Large coherent and multiply branched thrombi (maximal length 16 cm) were found intraoperatively (▶**Fig. 1**). Weaning from cardiopulmonary bypass was uncomplicated and the further course of the hospital stay was uneventful with discharge 6 days after surgery.

Video 1

Echocardiography (2D and 3D) of a patient with large biatrial thrombus caught in a patent foramen ovale. Intraoperative findings. Online content including video sequences viewable at: <https://www.thieme-connect.com/products/ejournals/html/doi/10-1055-s-0035-1559828-tcsr-15-0169-V1.mp4>.

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Fig. 1 Large thrombembolus extracted from both atria (left). 3D (right upper) and 2D (right lower) transesophageal echocardiography images from the thrombembolus entrapped in a patent foramen ovale.

Diagnosis of a thrombus entrapped in a PFO is a rare clinical event. Treatment strategy depends on size and mobility of the thrombus as well as on individual patient characteristics.

Discussion

In a recent review article, currently available clinical evidence from 174 individual patients described in 154 studies has been summarized.¹ These were mostly case reports or small sample size observational studies resulting in a high heterogeneity regarding patient demographics, treatment strategies, or study end points. Surgical thromboembolectomy was the most common treatment modality and was preferred in cases of pulmonary and/or systemic embolism and when large thrombi were present. Surgery resulted in a trend

toward improved survival and significantly reduced the rate of systemic embolization as compared with anticoagulation. However, because of a lack of data, decision making has to rely on clinical judgment rather than evidence.

Conflicts of Interest

Nothing to declare.

Reference

- 1 Myers PO, Bounameaux H, Panos A, Lerch R, Kalangos A. Impending paradoxical embolism: systematic review of prognostic factors and treatment. *Chest* 2010;137(1): 164–170