Canadian Journal of Cardiology 35 (2019) 1605.e5–1605.e6 www.onlinecjc.ca

Images in Cardiology

Device-Associated Left Atrial Thrombosis Despite Oral Anticoagulation After Percutaneous Patent Foramen Ovale Closure

Georgios Tzimas, MD,[a] Olivier Muller, MD, PhD,[a] Matthias Kirsch, MD, PhD,[b] and Pierre Monney, MD[a]

[a] *Department of Heart Vessels, Cardiology Service, Lausanne University Hospital and University of Lausanne, Lausanne, Switzerland*

[b] *Department of Heart Vessels, Cardiovascular Surgery Service, Lausanne University Hospital and University of Lausanne, Lausanne, Switzerland*

In the presence of a patent foramen ovale (PFO), paradoxic embolism is often considered as the cause of systemic embolism when no other cause is identified. Percutaneous PFO closure is a possible therapeutic strategy to avoid potentially life-threatening recurrences. Recent data indicate that percutaneous PFO closure is an effective and safe treatment option in secondary prevention, considering the low incidence of device-related complications as well as the low risk of recurrent stroke.

Case

A 37-year-old man with a history of recurrent venous thrombosis was admitted for subacute lower limb ischemia, and paradoxic embolism was considered to be likely after detection of a PFO. He underwent an uneventful percutaneous closure with the use of a 30-mm Atriasept (Cardia, Eagan, MN) closure device and remained under long-term anticoagulation with the use of rivaroxaban, owing to previous venous thrombosis, and aspirin for 6 months. Transthoracic echocardiography (TTE) performed 6 months after implantation showed good device position and no residual shunt. After missing scheduled follow-up TTEs and remaining asymptomatic, he had a routine consultation coupled with a TTE which showed a large echogenic mass, attached to a well apposed PFO closure device and floating in the left atrial cavity (Fig. 1, A-C). Cardiovascular magnetic resonance confirmed the presence of a 12 × 30-mm mass attached to the device (Fig. 1D), with no detectable perfusion. On late gadolinium enhancement, only a thin rim of enhancement was detected at the surface of the mass, suggesting a chronic thrombus (Fig. 1E). Laboratory investigation excluded an underlying coagulation disorder. The patient underwent successful surgical explantation of the device (Fig. 1F) and patch closure of the residual septal defect under cardiopulmonary bypass, and pathologic examination confirmed a device-attached thrombus.

Discussion

The antithrombotic regimen after PFO closure is based on expert opinion and usually consists of short-term dual-antiplatelet therapy. The incidence of thrombus formation is low and quite unusual years after implantation, and it usually resolves under anticoagulation. Although all available types of device can be implanted safely, the Amplatzer had fewer thromboembolic events reported in the literature. In the present case, the patient received oral anticoagulation as well as antiplatelet treatment for the first 6 months, after which anticoagulation alone was continued. Interestingly, in the absence of any demonstrable coagulation disorder, he developed late device thrombosis despite full anticoagulation with rivaroxaban. The precise reason for thrombus formation in this case is not clear, given the absence of risk factors such as atrial fibrillation, coagulation disorder, interatrial septal aneurysm, or the presence of residual shunt. Although the efficacy of novel anticoagulants in the presence of prosthetic material, typically the mechanical valves, has not yet been demonstrated, we think that this phenomenon occurred because of a hypercoagulable state in the context of chronic venous thromboembolic disease.

Received for publication April 18, 2019. Accepted August 4, 2019.

Corresponding author: Dr Georgios Tzimas, Department of Heart Vessels, Cardiology Service, Lausanne University Hospital and University of Lausanne, Rue du Bugnon 46, CH-1011 Lausanne, Switzerland. Tel.: 0041-795560629; fax: 0041-213140013.

E-mail: georgios.tzimas@chuv.ch

See page 1605.e6 for disclosure information.

https://doi.org/10.1016/j.cjca.2019.08.025

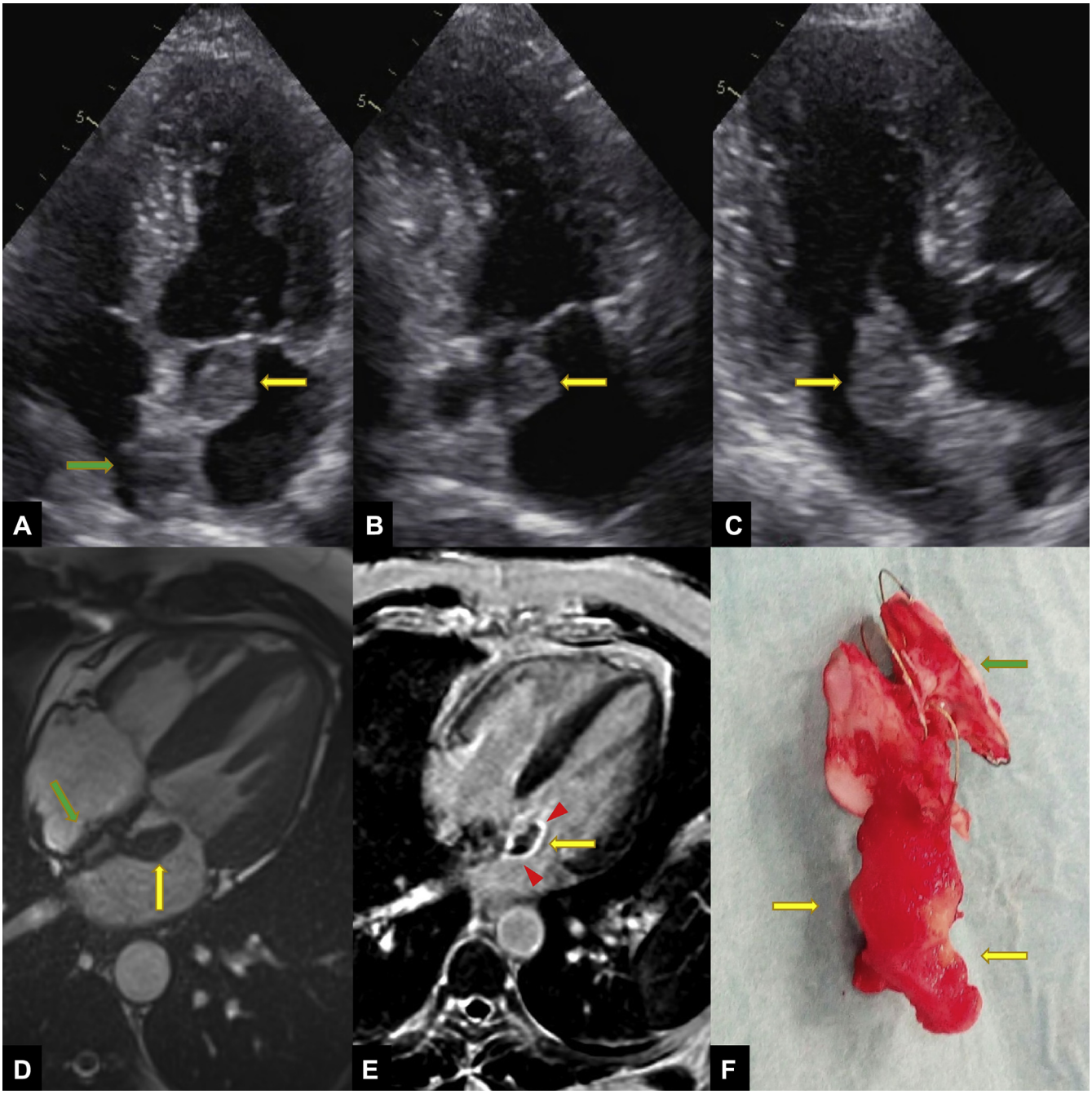

Figure 1. (**A-C**) Apical 4-, 2-, and 3 chamber view, showing a large echogenic mass (**yellow arrows**) attached to a well apposed patent foramen ovale closure device (**green arrow**) and floating in the left atrial cavity. (**D**) Cardiovascular magnetic resonance, showing the presence of 12 × 30-mm mass (**yellow arrow**) attached to the device (**green arrow**). (**E**) Cardiovascular magnetic resonance with late gadolinium sequences, revealing a thin rim (**red arrowheads**) of enhancement at the surface of the mass (**yellow arrow**), suggesting a chronic thrombus. (**F**) Explanted interatrial 30-mm closure device (**green arrow**) with attached organized thrombus (**yellow arrows**).

Conclusion

This case shows that device-associated thrombosis may occur several months after implantation and illustrates the need for careful patient evaluation and selection for PFO closure device placement, especially with screening for hypercoagulable states. It highlights the need for long-term follow-up of patients treated with intracardiac devices, even under anticoagulation treatment.

Disclosures

The authors have no conflicts of interest to disclose.