

Migration of femoral vein thrombus to the right ventricle: an undesirable complication in patients undergoing electrophysiological procedures

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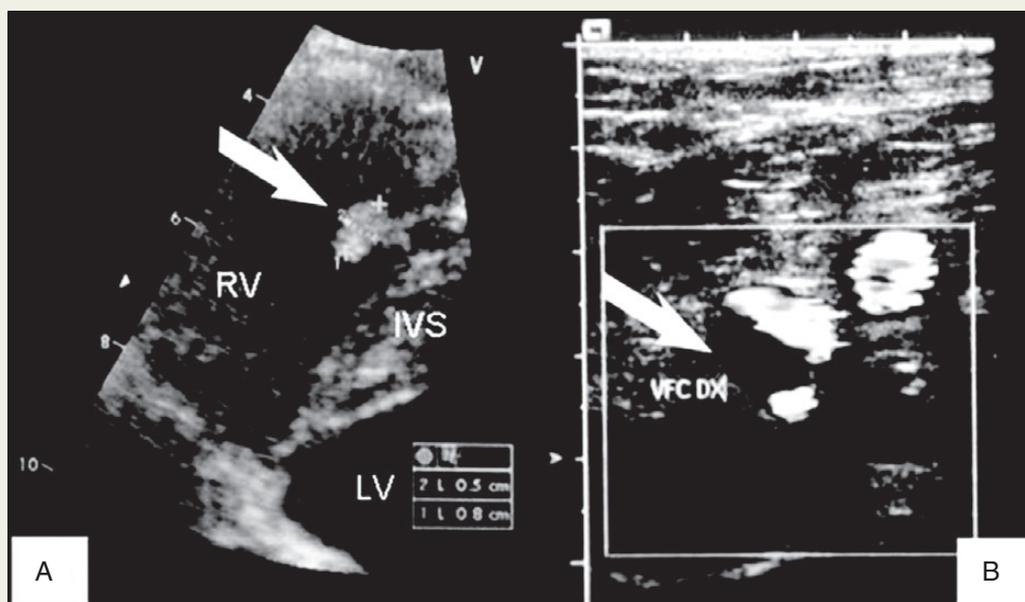
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A 44-year-old obese man with a history of type 2 diabetes underwent electrophysiological study due to recurrent short-lasting episodes of palpitations and documented paroxysmal supraventricular tachycardia. After introduction of two venous sheaths into both the common femoral veins a slow–fast atrioventricular nodal re-entrant tachycardia (AVNRT) was induced, and the slow pathway was ablated uneventfully. The procedure lasted 100 min (fluoroscopic time 12 min). Following 48 h, the patient underwent routine echocardiographic pre-discharge control. The examination revealed a grape-like mobile mass entrapped into the right ventricular (RV) moderator band, with an aspect compatible with a thrombus (Panel A, see Supplementary material online, Video S1). Unfractionated heparin was immediately started at therapeutic doses. A Doppler ultrasound scan showed a dilated and not compressible distal tract of the right common femoral vein whose lumen was partially occupied by an isoechoic formation compatible with a recent DVT (Panel B). Clinical and instrumental workup for acute pulmonary embolism was negative (D-Dimer = 0.6 mg/L), and no echocardiographic signs of RV dilatation or dysfunction were detected. Over the following days the patient remained asymptomatic, and therapy with warfarin was commenced until INR reached the therapeutic range (2–3). Serial echocardiographic controls revealed a complete resolution of the thrombus after 12 days. The patient was discharged asymptomatic and in good haemodynamic state. After a few months, once obtained the entire thrombophilic screening (including homocysteine levels, antinuclear antibodies, antithrombin-III, MTHFR, lupus anticoagulant, protein S and protein C) which did not show any relevant alteration, anticoagulation therapy was interrupted.

AVNRT is a routine EP procedure characterized by an optimal risk benefit ratio. Vascular complications, including DVT with subsequent acute pulmonary embolism, may occur. Placement of venous sheaths is a risk factor for vascular thrombosis contributing to venous stasis and vascular inflammation. The incidence of asymptomatic DVT formation, following sheath placement for EP studies, is high (16 to 44%). In contrast, symptomatic DVTs are much lower (0.5–0.8%).¹ Although there are weak supporting data, it is reasonable that limiting the number and the size of femoral vein sheaths on the same side can minimize thrombosis risk.

In our patient we can suppose obesity, as well as procedure's length, could play a potential additional role in the formation of thrombosis because of the time-dependent activation of platelets and coagulation factors. Despite there are no large prospective or randomized trials, perhaps prophylactic heparin administration during the procedure may be considered on an individual basis for right chamber ablations, particularly for longer procedures, or in high-risk patients.²

Large emboli migrated from leg veins can lodge in the RV, whereas smaller emboli are likely to pass unimpeded to the pulmonary arteries. The occurrence of pulmonary embolism following EP procedures has previously been reported, especially in patients with a thrombophilic state. Moreover, two cases of floating atrial thrombi following EP studies were successfully treated with thrombolysis



in asymptomatic patients.³ However, it should be noted that thrombolysis is a potentially harmful approach which has not yet shown superiority when compared with heparin in haemodynamically stable patients.

In conclusion, we report a case of asymptomatic femoral thrombosis complicated by a migrating thrombus to the RV, successfully treated with anticoagulant therapy. Two-dimensional echocardiography and fast ultra-sonographic scan of femoral veins were crucial in the pre-discharge evaluation. The case encourages a scrutiny clinical evaluation in prevention and management of such undesirable complication in the setting of electrophysiological procedures.

Supplementary material is available at *Europace* online.

Panel A. Echocardiogram performed 48 h after ablation (four-chamber modified view) showing a grape-like mobile mass (0.8 cm X 0.5 cm) entrapped in the right ventricular moderator band, compatible with a thrombus. *Panel B.* Post-ablation ultrasound image of femoral vein. The distal tract is dilated and not compressible with the lumen partially occupied by isoechoic material compatible with recent thrombosis. RV, right ventricle; IVS, interventricular septum; LV, left ventricle; VFC DX, right common femoral vein.

References

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