the tachycardia and the brief termination with changes in position further established the importance of the contact between the chest tube and the heart in maintenance of the tachycardia.

The change in cardiac rhythm following tube thoracotomy is a rare cause of refractory arrhythmia and our report is the first to describe ventricular tachycardia. Rapid recognition of the tube as a potential cause of dysrhythmia could prove life saving in haemodynamically significant arrhythmias.

Conflict of interest: none declared.

References

CASE REPORT

Left atrial Lasso catheter thrombus aspiration

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Sheath- and catheter-associated thrombi have become increasingly identified with the use of intracardiac echocardiography during left-sided ablation procedures. Despite adequate anticoagulation, these thrombi are found in ~10% of cases. Management of these thrombi includes withdrawal of the sheath and catheter when the thrombi are felt to be firmly attached. In our case, we show another management technique, aspiration.

Case presentation

A 61-year-old woman was electively admitted to our institution to undergo a planned ablation for the treatment of symptomatic paroxysmal atrial fibrillation. Her warfarin had been discontinued 5 days prior to the procedure, with enoxaparin injections used for anticoagulation bridging. Pre-ablation evaluation included a transesophageal echocardiogram with normal ejection fraction, no wall motion abnormalities, and no thrombus noted the morning of the scheduled procedure.

During the ablation procedure, transseptal puncture was performed with intracardiac echocardiography for guidance. While infusing heparinized saline (2 units/mL) at 3 mL/min through an 8F transseptal sheath (SL0, St. Jude Medical, St. Paul, MN, USA), it was positioned transseptally into the left atrium (LA), followed by advancement of a standard J-tip wire to the left upper pulmonary vein with subsequent sheath removal. A second transseptal puncture was performed using an SL0 sheath again while infusing heparinized saline at 3 mL/min through it. The placement of this second sheath occurred within 1 min of the initial sheath placement. Through this SL0 sheath, a circumferential mapping catheter (Lasso, Biosense Webster Inc., Diamond Bar, CA) was then positioned within the LA. Over the previously retained J-tip wire, an Agilis steerable sheath (St. Jude Medical, St. Paul, MN) was positioned in the LA, and an ablation catheter was placed through this sheath. Heparin was infused immediately, <1 min, after the sheaths were stably situated within the LA.

Prior to any ablation, the Lasso catheter was noted to have a pedunculated thrombus (Figure 1A, see online Supplementary material, Video 1) attached near the distal shaft of the catheter. The thrombus was present despite an initial heparin bolus with infusion to an activated clotting time (ACT) of >300. At this point, the two sheaths were positioned in parallel and simultaneous aspiration from both sheaths was performed while the Lasso catheter was withdrawn from the LA, resulting in successful aspiration of the thrombus (Figure 1B, see online Supplementary material, Video 2). A 1.5 cm thrombus was seen in the aspirate from the steerable sheath (Figure 1C). Both sheaths were withdrawn and the ablation procedure was aborted. At follow-up, no transient ischemic attack or stroke was noted, and a hypercoagulable work-up was unremarkable. She subsequently underwent a successful, repeat atrial fibrillation ablation 2 months later.

Discussion

These dramatic images of rapid thrombus formation support the notion that placement of electrophysiology catheters, even prior to radiofrequency ablation, is pro-thrombotic.1 The prevalence of sheath and catheter-associated thrombus may be ~10% of cases by intracardiac echocardiography despite anticoagulation with heparin to an ACT >250 s.2 Potential clot formation may result from vessel wall injury from venipuncture, clotting cascade activation by the catheter acting as a foreign body, or trauma to blood itself.3 Although aspiration of the thrombi has been successful, left-sided ablation procedures have an embolic complication rate of

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Due to this significant potential risk, systemic anticoagulation or flushing of transseptal sheaths with high concentration heparin prior to transseptal puncture should be considered. Consideration can also be given to infusion devices that can detect occlusions with audible warning.

Supplementary material
Supplementary material is available at Europace online.

Conflict of interest: none declared.

References