Aorto-right atrial fistula: a rare complication of trans-septal puncture and catheter ablation for atrial fibrillation

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A 43-year-old woman was referred to our medical centre in the setting of persistent tachyarrhythmias. She had undergone multiple catheter ablation procedures at her local medical institution, one of which resulted in an iatrogenic injury of her ascending aorta during a trans-septal puncture. Her procedural records suggested that the catheter was inadvertently advanced over the Brockenbrough needle and was visualized in the left ventricle. The catheter was then pulled back into the right atrium (RA), and the procedure was aborted. Various imaging studies were performed at our centre. Transoesophageal echocardiography (two-dimensional and three-dimensional imaging; Panels A–D) demonstrated a fistulous connection between the non-coronary sinus of Valsalva and the RA, while Doppler assessment showed continuous blood flow from the ascending aorta to the RA (Panel C). This fistulous connection originates from the non-coronary sinus of Valsalva and has a short but serpiginous course to exit into the RA at the junction of the interatrial septum and the roof of the RA, whose internal anatomic surface marking is the torus aorticus. These echocardiographic findings were confirmed by cardiac computed tomography with contrast (Panels E–F). This patient subsequently underwent a surgical suture closure of the fistula due to concern related to unknown stability and haemodynamic consequence of this lesion (pre-operative, Supplementary data online, Movie S1; post-operative, Supplementary data online, Movie S2). This case illustrates a rare complication associated with trans-septal puncture and highlights the important anatomical structures contiguous with the interatrial septum. LA, left atrium; RA, right atrium; AV, aortic valve; arrow, aorto-right atrial fistula.

Supplementary data are available at European Heart Journal – Cardiovascular Imaging online.