Double transseptal puncture guided by real-time three-dimensional transoesophageal echocardiography during atrial fibrillation ablation

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A 65-year-old man was admitted to our centre because of recurrent drug-resistant episodes of paroxysmal atrial fibrillation, for pulmonary vein radiofrequency catheter ablation. Double transseptal (TS) puncture was performed under real-time three-dimensional transoesophageal echocardiography (RT 3D TEE) guidance. We started by placing a quadripolar catheter in the coronary sinus and a Pigtail catheter in the aortic root as fluoroscopic landmarks. We then positioned the first 8 F TS sheath (St Jude Medical, St Paul, MN, USA) in the superior vena cava. Under echo and biplane fluoroscopic guidance in anterio-posterior and left-lateral projections, the whole system was withdrawn and placed in the fossa ovalis keeping the needle hub arrow pointing between 3.30 and 5 o’clock position. The position was confirmed by RT 3D TEE imaging (Philips i 33 ultrasound system, X7-2t TEE probe, Philips Ultrasound, Bothell, WA 98021-8431, USA) by applying a slight pressure to obtain 'tenting' of the fossa ovalis (Figure 1A). We then performed the puncture of the septum with the needle under low flow saline flushing (Figure 1B). A short injection of contrast was used for further confirmation of TS puncture. Right after this, we advanced the sheath-dilator assembly over the needle. We then performed a second puncture under echocardiographic guidance using the same approach as described earlier (Figure 1C).

In this setting, RT 3D TEE was of upmost importance showing not only the fossa ovalis, but also the orientation of the needle. This is due to its visual 3D information. We could push the needle through in total safety, minimizing the risk of complications.

Figure 1D shows a fluoroscopic image in an antero-posterior projection of the second TS puncture including the landmarks.

Conflict of interest: none declared.

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Figure 1  (A) “Tenting” of fossa ovalis by applying slight pressure to the transseptal system. (B) Puncture of the fossa ovalis with visualization of the needle in the left atrium. (C) After second transseptal puncture, visualization of both sheaths crossing the fossa ovalis. (D) Fluoroscopic image in antero-posterior projection of the second transseptal puncture including landmarks.