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UNIQUE IMAGE REVIEW

Transseptal Puncture in a Patient with Double Interatrial Septum

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A 60-year-old male with a history of drug refractory, symptomatic atrial fibrillation presented for atrial fibrillation ablation. His preoperative work-up included a trans-thoracic echocardiogram and computed tomography (CT) scan, both of which were reported as normal. Prior to the transseptal puncture of the interatrial septum, a transesophageal echo probe was placed (Figure 1).

The patient has a double interatrial septum. A double interatrial septum is a rare anomaly that has been reported previously in the literature.1 The origin is thought to be a double layer of a single embryological septum with space between. Alternatively, the double septum may be secondary to an intramural hematoma that can cleave the septal plane.2 It is differentiated from cor triatrum as the extra membrane runs parallel to the traditional interatrial septum, rather than perpendicular to it. Unlike in cor triatrum, there is free communication of the mitral valve and pulmonary veins.

In this case, transseptal puncture allowing for access to the left atrium was attempted with the use of a Brockenbrough needle and SL-1 sheath. The sheath/needle apparatus was placed in the middle of the posterior portion of the intra-atria septum. Tenting was achieved but extension of the needle, access to the left atrium could not achieved with manual pressure. Electrocautery was then applied to the tip of the Brockenbrough needle at 20 W for 2 s initially and then increased to 30 W for 5 s without success. The procedure was then abandoned because of inability to access the left atrium. A previous report recommended puncture at the confluence of the two septum. In this patient, a confluence was not present.3

A repeat procedure was then attempted on a later date with a different operator. Access was again attempted but not achieved in the middle of the posterior interatrial septum with electrocautery. Access to the left atrium was then achieved with tenting on the superior and inferior aspects of the posterior interatrial septum with manual pressure only. An atrial isolation was performed without incidence. A left atrial tachycardia occurred approximately 6 months later. After failure of medical therapy, an ablation was again performed by the original operator. Transspetal access was again achieved at the inferior and superior portion of the posterior interatrial septum with manual pressure only.

Double intra-atrial septum has been documented in the literature. There have, however, not been any reports describing the transseptal puncture procedure in patients with this variant. Puncture of the mid-portion of the posterior interatrial septum was unable to be achieved in two separate instances with two different operators using manual pressure and electrocautery. The mechanism may be due to the combined thickness of the two septum at this location. Alternatively, it could be due to tissue with more resistance than a single septum. The combined thickness of the two septum is thinner at the inferior and superior aspects of the posterior interatrial septum, which allowed for transseptal access.

References
Figure 1: Transesophageal echo probe.