

Technique for Crossing a Patent Foramen Ovale

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Crossing a patent foramen ovale (PFO) can sometimes be daunting. The ubiquitous relationship of the fossa ovalis to the inferior vena cava and the degree of attachment of the septum primum to secundum, as well as the compliance of the primum, contribute to the challenge. Directing a straight guidewire at the approximate location of the fossa is a common technique. We have found that using a multipurpose catheter and a J-tipped soft guidewire is more reliable and probably a safer approach (Figure 1). Panel A shows an intracardiac ultrasound probe directed toward the PFO. A multipurpose catheter is at the junction of the inferior vena cava and right atrium. The J-wire is advanced slowly from the tip of the multipurpose catheter using a perpendicular line from the intracardiac echo catheter transducer to help determine the location of the PFO. In panels B, C, and D, the wire is seen to advance in sequential frames across the PFO and left atrium and into the left upper-lobe pulmonary vein. In panel D, it is clear that the wire is in the left upper-lobe pulmonary vein because it has crossed the left heart border and appears over the lung field.

Panel E shows a wire with approximately the same trajectory as seen in panel D, but in panel F, the wire curls in the left atrial appendage (LAA) and does not cross the heart border.

It is critical to recognize the difference between wire position in the pulmonary vein and LAA. It is certainly more desirable to anchor a wire in the pulmonary vein for the sheath exchange necessary as part of a PFO closure procedure.

When the LAA is entered, the multipurpose catheter can be passed into the left atrium, the wire can be pulled back from the LAA, and clockwise rotation applied to the catheter to direct the guidewire posteriorly into the left upper-lobe pulmonary vein.

Panel G shows the septal closure device in place at the completion of this procedure. The white line identifies the axis of the PFO tunnel between the two center markers of the closure device. ■

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