

Taking any Route Possible to Achieve Cardiac Resynchronization

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An 85 year old man with non-ischaemic dilated cardiomyopathy, severe left ventricular systolic dysfunction and severe symptoms of heart failure was referred for Cardiac Resynchronisation Therapy (CRT). His resting 12 lead ECG revealed atrial fibrillation with a bradycardic ventricular response despite no rate limiting agents, and a left bundle branch block with the QRS duration of 156 ms.

Positioning of the right ventricular lead (St. Jude Optisense 1999 52cm) was straightforward via a left infraclavicular approach. Accessing the Coronary Sinus (CS) to implant the left ventricular lead was difficult due to repeated cannulation of a small parallel tributary (Figure 1 image A). Retrograde contrast venography using this vein revealed a large CS with a tight proximal stenosis, and a small persistent left sided superior vena cava (PLSVC) (Figure 1 images B and C). Access to the PLSVC was gained using a hyperacute sub-selection catheter (Medtronic Attain Select II), and a hydrophilic coated guidewire (Terumo Glidewire) was passed into the coronary sinus. The PLSV was engaged with a steerable sheath (Medtronic Attain Command system) to provide support for the sub-selection catheter which was advanced into the coronary sinus (Figure 1 image D). Antegrade venography revealed a high lateral vein, with a retrograde junction to the main CS (Figure 1 image E). The Left Ventricular (LV) lead (St Jude Quick Flex

micro 1258 88cm) was successfully passed into a satisfactory position (Figure 1 image F). Lead thresholds and positions were stable at 24 hour post procedural device interrogation (Figure 2).

This case describes how standard sheath and catheter shapes used imaginatively can overcome difficult anatomy. A PLSVC is estimated to occur in 0.3% of individuals without congenital abnormalities. It is the most common venous cardiac abnormality, and is most often identified incidentally during pacemaker implantation [1]. Due to increased flow, the CS in patients with a PLSCV is often large, usually making cannulation for LV lead placement during cardiac resynchronisation therapy easy, but achieving a stable lead position more difficult. Our case demonstrates the benefit of doing a complete venogram during CRT implantation and that even a vestigial PLSCV can be used to access the CS for LV lead placement [2,3].

References

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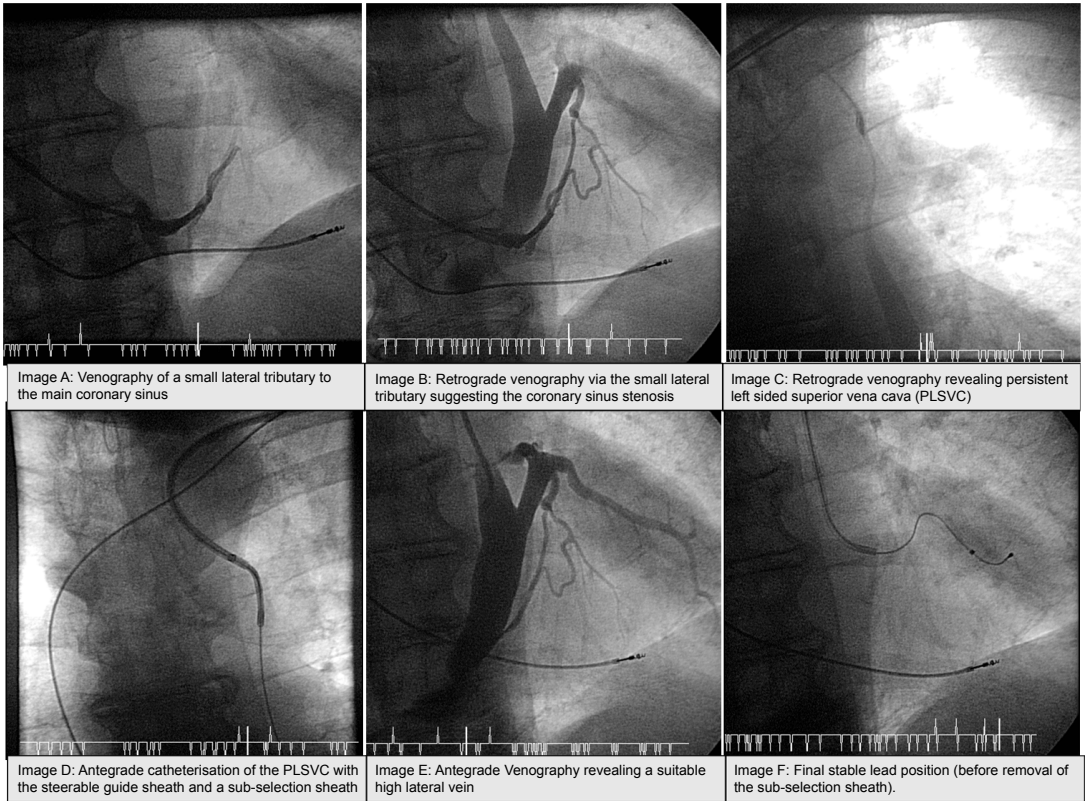


Figure 1: Venography
Image A: Venography of a small lateral tributary to the main coronary sinus
Image B: Retrograde venography via the small lateral tributary suggesting the coronary sinus stenosis
Image C: Retrograde venography revealing Persistent Left Sided Superior Vena Cava (PLSVC)
Image D: Antegrade catheterisation of the PLSVC with the steerable guide sheath and a sub-selection sheath
Image E: Antegrade venography revealing a suitable high lateral vein
Image F: Final stable lead position (before removal of the sub-selection sheath).

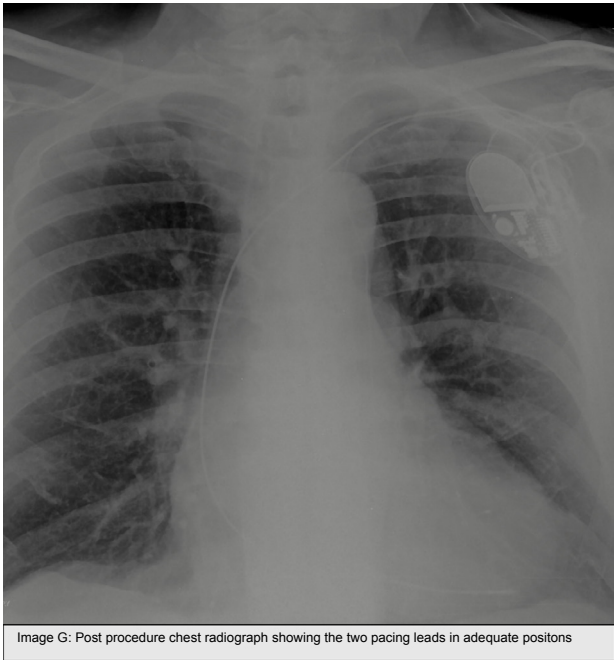


Figure 2: Post procedure chest radiograph showing the two pacing leads in adequate positions.