Transvenous right ventricular pacing through coronary sinus in a patient with persistent left superior vena cava

Sir,
A 60-year-old lady presented with two episodes of syncope in the last four weeks. Electrocardiogram showed complete heart block with ventricular escape rhythm at 30/min. Transvenous permanent pacemaker implantation (PPI) was planned. Using Seldinger’s technique, guide wire was introduced through left subclavian vein, which entered right atrium (RA) via persistent left superior vena cava (PLSVC) and coronary sinus (CS) [Figures 1 and 2]. A tined pacing lead was advanced into the RA. The straight stylet was removed from the lead and replaced with a preshaped stylet. A J-loop was formed in the terminal 5 cm of the stylet that directed the lead anterio-inferiorly across the tricuspid valve into the right ventricular (RV) inflow area. The

Figures 1-2: X-ray chest in PA (Figure 1) and lateral (Figure 2) views showing the pacemaker lead following the course of the persistent left superior vena cava, coronary sinus and right atrium into the right ventricle.
A tined lead was advanced to the apex of RV where its anchorage was confirmed on withdrawing the stylet and its position was stabilized by forming a loop against the lateral wall of the right atrium. The lead parameters were found satisfactory. At 30 months of follow-up, the pacemaker continues to function normally with optimal parameters.

Manipulation of the transvenous lead through this unusual venous route is often associated with complications. Advancing the lead through this tortuous route can subject the lead to acute bend thereby predisposing to fracture and displacement of lead and failure of pacing. Once RA is reached, further placement of the lead into the RV becomes difficult, because the tip of the lead tends to be deflected away from the tricuspid orifice. Harris et al. used a soft electrode wire (Elama) with a heavy tip to guide the wire into the RV by gravity in the left lateral position.[8] It has been suggested that stylet shaping and use of active fixation leads could help the proper lead anchorage.[2-4] Dirix et al., during implantation of dual chamber pacemaker via PLSVC, used a J-shaped atrial lead as the ventricular lead and implanted it in the anteroapical part of the RV.[5] Zerbe et al. reshaped the end of the stylet into a 3-4 cm wide pigtail loop and placed the lead in the RV in four of their patients.[5] Hsiao et al. demonstrated an open J-loop technique wherein the stylet was placed in a semicircular curve in the RA with the tip of the stylet directed to the orifice of the tricuspid valve anteroinferiorly. While the reshaped stylet was held and fixed in the RA, the lead was advanced into the RV and was implanted into the RV apex.[4] The use of a steerable stylet for similar purpose was reported by Hanna-Mousa et al.[8] Recently, Srimannarayana et al. described the use of the atrial ‘J’ stylet to guide the tined, ventricular lead across the tricuspid valve to reach the right ventricular inflow portion.[6]

This case is being reported to highlight the technical difficulties that may be encountered in PPI through left subclavian vein, the feasibility of achieving a good position of the lead in RV apex when introduced via PLSVC and the long-term success of this technically demanding procedure in our patient.

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References