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CLINICAL VIGNETTE

Transvenous left ventricular lead placement in a patient with mechanical tricuspid, aortic, and mitral valves

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A 62-year-old woman was referred for upgrade of her single chamber AAIR pacemaker to dual chamber due to symptomatic bradycardia with high-grade AV block. She previously underwent mechanical aortic, mitral, and tricuspid valve replacement due to rheumatic heart disease. Subsequently, she developed sick sinus syndrome and a single chamber pacemaker (AAIR) was implanted. No ventricular leads were placed at that time due to the presence of the mechanical tricuspid valve. Mechanical tricuspid valves present a challenge to implantation of endocardial right ventricular leads for pacing. Epicardial leads can be implanted surgically. However, prior cardiac surgeries in these patients increase surgical risk. The development of epicardial LV leads introduced via coronary sinus (CS) has made transvenous approach for ventricular pacing feasible in these patients.

In this case, a CS guiding catheter was used to engage the CS. Cannulation of the CS was done with fluoroscopic guidance in the left anterior oblique (LAO) projection to avoid unwanted crossing of the mechanical tricuspid valve. CS venogram was obtained (Panel A). An over-the-wire CS lead system was then advanced into an anterior CS branch. Pacing threshold was adequate with no diaphragmatic stimulation. Lead position was verified in AP, LAO, and RAO projections (Panels B–D). The pacemaker was programmed in DDDR mode.

We emphasize in this case that LAO projection should be used to optimally visualize and prevent crossing of the mechanical tricuspid valve during CS cannulation. This case demonstrates feasibility of transvenous epicardial LV lead placement in patients with mechanical tricuspid valves.

Panel A. Fluoroscopic images of CS venogram in AP view. TV, tricuspid valve; MV, mitral valve; AV, aortic valve.
Panel B. Final lead position in AP projection. TV, tricuspid valve; MV, mitral valve; AV, aortic valve.
Panel C. Final lead position in left anterior oblique projection. TV, tricuspid valve; MV, mitral valve; AV, aortic valve.
Panel D. Final lead position in right anterior oblique projection. TV, tricuspid valve; MV, mitral valve; AV, aortic valve.

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