Authors must give final approval of the version to be submitted and any revised version to be published. For multicenter trials, individuals who accept direct responsibility for the manuscript should fully meet the criteria for authorship previously defined; contributors not meeting these criteria should be acknowledged.

(e) Note avoidance of false claims of ownership and priority, by attention to previous publications.

(f) Establish avoidance of excessive claims of benefits of a product/technique in the publication as well as with news media.

(g) Note compliance with institutional review board requirements and, when appropriate, approved laboratory procedures for animal research, and that the research conforms to the ethical standards of the Declaration of Helsinki, the Geneva Declaration, the Belmont Report, and Good Clinical Practices from the FDA, and the submission conforms to the International Committee of Medical Journal Editors (ICMJE) ‘Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication’ (www.ICMJE.org).

**CLINICAL VIGNETTE**

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

**Taylor I Liu**, **Gregory K Feld**, and **Ulrika Birgersdotter-Green**

Cardiac Electrophysiology Program, University of California, San Diego, 4168 Front Street, San Diego, CA 92103, USA

* Corresponding author. Tel: +1 6195433652, Fax: +1 6195435576. Email: tiliu@ucsd.edu

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.

Published on behalf of the European Society of Cardiology. All rights reserved. © The Author 2007. For permissions please email: journals.permissions@oxfordjournals.org.