IMAGES IN CARDIOLOGY

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Left ventricular lead placement within a coronary sinus side branch, using only a floppy guide wire and magnetic navigation

In a 68 year old male patient with advanced refractory heart failure we engaged both the coronary sinus (CS) os and an appropriate side branch using an external magnet based system (Stereotaxis, St Louis, Missouri, USA) and a modified 0.014 guide wire equipped with a single magnet in the tip (Cronus Floppy Endovascular Guide wire, Stereotaxis). This was done without a sheath in the atrium, after having performed coronary angiography with late phase runs to demonstrate the anatomy of the CS. Markers were placed on the images (panels A and B) using the Stereotaxis Navigant™ navigation system and two radiographic views (26° RAO and 26° LAO—the maximum allowed by the large external magnets). With the external magnets and target based navigation, the Cronus wire was advanced into the CS and then into a side branch with vector based navigation (panel C). Advancement of the pacing lead (ELA Situs OTW UW28D, ELA Medical, Le Plessis-Robinson Cedex, France) in the selected side branch was somewhat complicated by a lack

of stiffness of the guide wire with some buckling at the caval—right atrial junction and within the right atrium (supplemental file posted online). Use of this technique, with the ability to design different guide wires more suited to magnetic navigation, may remove some of the obstacles to LV lead placement such as the risk of dissection or perforation, or lead displacement during sheath removal.

Supplemental material is available on the *Heart* website (<http://www.heartjnl.com/supplemental>).

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Panels A and B RAO 26° view on the left and LAO 26° view on the right with late phase filling of the CS after left coronary angiography. The os of the CS has been marked with four dots using the Stereotaxis Navigant System™ and these markers are then used to target the modified guide wire using the externally controlled magnets.

Panel C LAO 26° view with the left ventricular lead positioned in a posterolateral branch of the coronary sinus. Also present is a second guide wire introduced via the same route. The yellow line is the target line drawn on the navigation system to enable the external magnets to allow engagement of the guide wire in the CS os. As can be seen a degree of overcompensation is required compared to the yellow dot markers signifying the perceived orifice of the os from the initial target as per panels A and B.