

IMAGES IN MEDICINE

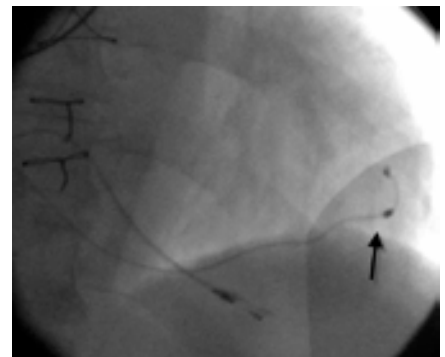
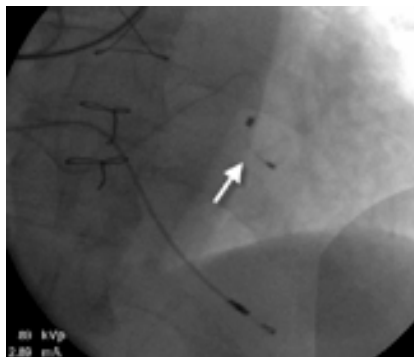
Middle Cardiac Vein Pacing Avoids Phrenic Nerve Stimulation, Offers Optimal Resynchronization and Obviates Surgery for Epicardial Lead Placement

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BACKGROUND. Occasionally, for effective cardiac resynchronization therapy (CRT), it is not feasible to place a left ventricular (LV) lead in a suitable coronary sinus (CS) tributary that avoids phrenic nerve stimulation (PNS). In these instances, surgery is required for epicardial lead placement.

CASE REPORT: A 64-year old patient with refractory heart failure had a biventricular pacing system implanted with the LV lead placed at a posterolateral CS branch at another hospital (white arrow, left panel). However, at this position he suffered from persistent PNS, which could not be remedied by pacemaker re-programming. At this point the patient sought a second opinion and was referred to our hospital. Indeed, even at threshold levels of pacing output and at all possible lead configurations programmable, there was persistent PNS and re-intervention was recommended for LV lead revision. Through the CS and with use of an angioplasty wire technique, all lead positions at the lateral CS branches failed to produce reliable pacing and/or avoidance of PNS. Thus, cannulation was then attempted, and finally achieved with some difficulty, of the middle cardiac vein (MCV) originating at the CS os at an acute angle take-off, and the pacing lead was placed at an apical posterolateral position (black arrow, right panel). Pacing and sensing thresholds were excellent. The patient's course was uncomplicated; he had an echo-guided optimization of the AV and VV intervals and at 8 months he remains without PNS with excellent pacing (<1 V/0.5 ms) and sensing thresholds and considerably improved clinically (from NYHA class III-IV to a class I-II status).



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In conclusion, when LV lead positioning through the CS and into its lateral tributaries is either not feasible or associated with persistent PNS or high thresholds, cannulation of the MCV, albeit technically difficult, and thus lateral lead positioning via this vein, may offer an excellent alternative for optimal CRT, avoid PNS and obviate the need for surgery for epicardial lead placement.