

Balloon anchoring to exchange a displaced left ventricular lead over a wire without a coronary sinus guide catheter

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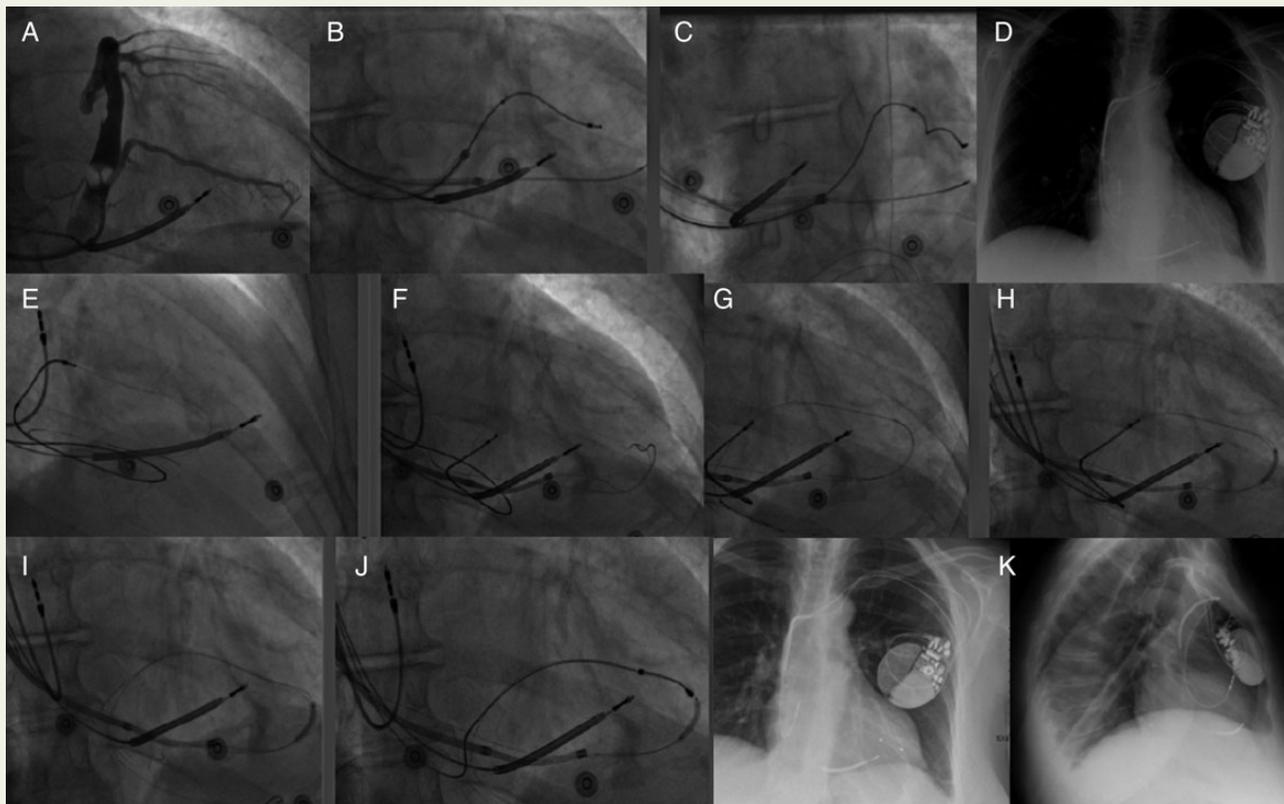
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This case illustrates the use of the coronary interventional technique of balloon anchoring to enable sheathless exchange and reimplantation of a displaced left ventricular lead in a challenging cardiac resynchronization therapy case.

A 59-year-old woman with a non-ischaemic cardiomyopathy (EF 28%, LBBB, QRS duration 190 ms) was brought forward for a cardiac resynchronization therapy (CRT) defibrillator device. An implantable cardioverter-defibrillator lead was implanted at the low right ventricular septum. The coronary sinus (CS) was then cannulated with a multipurpose guiding catheter and occlusive balloon venography (*Panel A*) revealed a single posterolateral vein branching off the CS at an acute angulation. Left ventricular (LV) lead placement was challenging and the angulation of the branch meant the CS guide catheter prolapsed into the RV whenever we advanced the LV lead. Attempts at advancing several 5 F LV electrodes failed and the only trackable lead was a 4 F unipolar lead, placed using a wire externalization technique (as previously described^{1,2}) (*Panels B and C*). Unfortunately, the lead displaced within 24 h (*Panel D*) and, in retrospect, it may have been wise to have tried harder to advance a larger 5 F LV using the externalized wire.

A repeat procedure was performed. The lead had migrated proximally but the tip remained in the target branch (*Panel E*). A 0.014 in. guidewire passed antegradely through the LV lead was advanced into the middle cardiac vein (MCV) via collateral vessels and back into the right atrium (*Panel E*). We did not reposition the 4 F lead due to concerns about long-term stability and instead opted to implant a 5 F bipolar lead. To provide additional support to advance a larger lead, we chose an anchoring balloon technique.

A multipurpose CS guide catheter was used in conjunction with an inner catheter to cannulate the MCV. A 0.014 in. coronary guidewire was introduced retrogradely from the MCV to the posterolateral target branch, and through the CS to the right atrium (*Panel F*). Over this guidewire, a 2.5 × 15 mm compliant balloon was passed retrogradely and inflated in the distal posterolateral branch to anchor the antegrade wire in position to provide extra support (*Panels H and I*). The LV lead was then removed.



A 5 F LV electrode was then passed over the antegrade guidewire which, with the balloon anchor, provided enough support to advance the LV electrode without the need for another CS guide catheter (*Panel J*). The LV lead was advanced into the final position, the anchor balloon deflated and slowly withdrawn (*Panel K*). All guidewires and sheaths were then removed. There were no issues with lead stability and the patient has responded well to CRT.

Discussion

Implantation of left ventricular leads fails in up to 10% of CRT cases¹ despite current CRT tool sets. This has led to crossover of interventional cardiology techniques such as those used in angioplasty of chronic total occlusions.¹⁻³ Balloon anchoring is one technique that may be utilized to improve the success of LV lead implantation in challenging cases and consequentially improve clinical outcomes.

Conflict of interest: none declared.

References

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