

## EP CASE REPORT

# Extraction of left bundle branch pacing lead: a safe procedure?

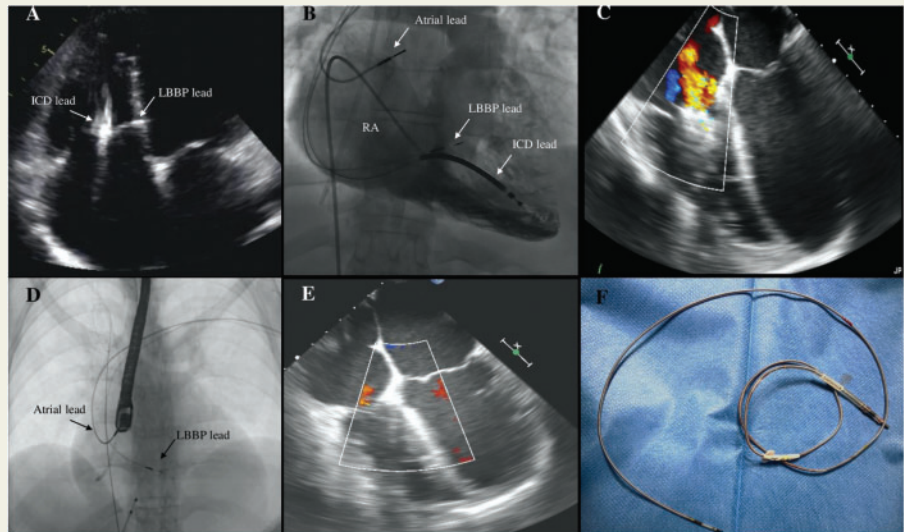
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A 28-year-old woman, with atrial fibrillation and previous cerebral ischaemic stroke, underwent left bundle branch pacing (LBBP) for left bundle branch (LBB) block and heart failure. LBBP was achieved via a transventricular-septal approach using the SelectSecure pacing lead (3830, 69 cm, Medtronic Inc., Minneapolis, MN, USA). The lead was placed about 2 cm distal to the His region and deep into the interventricular septum (Figure 1A). A passive atrial lead and an active implantable cardioverter-defibrillator (ICD) single-coil lead were also implanted. Few months later, she developed worsening heart failure, with lead-related severe tricuspid regurgitation (TR) in the absence of infection, despite optimal medical therapy (Figure 1B,C). Subsequently, she was referred to our Department for both lead extraction and treatment of refractory heart failure, 10 months later, initial implant. The procedure was performed under general anaesthesia. A stiff guidewire from the right femoral vein to the right internal jugular vein for potential use of occlusion balloon in case of vascular lacerations was placed. The ICD lead was removed first using manual traction and locking stylet. The SelectSecure lead in the deep septal LBB location was removed by gentle manual traction and counterclockwise rotations under transesophageal echocardiography (TE) guidance simultaneously (Figure 1D and Supplementary Material). Finally, mechanical extraction tool (Evolution RL 9F, Cook Medical, Bloomington, USA) was necessary for removing the atrial lead. Post-procedural TE revealed a moderate TR and any evidence of interventricular septal defect (Figure 1E,F). Despite a reduction in tricuspid valve regurgitation, the patient is currently under evaluation for heart transplantation for biventricular heart failure refractory to medical therapy.

His-bundle pacing, which utilizes the native cardiac conduction system is a well-accepted physiologic pacing.<sup>1</sup> However, it has some limitations, such as operational difficulty and higher pacing thresholds.<sup>1</sup> Thus, recently the LBBP via a transventricular-septal approach has emerged as an alternative physiologic pacing and for correction of LBB block, with a low, stable pacing capture threshold and relatively narrow QRS duration due to fast left ventricular activation and direct excitation of the diseased LBB.<sup>2</sup> However, due to the distal part of the lead burden inside the septum major concerns regarding the impact of lead extraction remain. For long implant LBBP leads which need to use powered sheaths one of the concerns raised is the lack of lumen for placing a locking stylet for extraction. The presence of more leads including the LBBP lead represents a further peculiarity of our case raising others possible concerns for the removal sequence of the leads.



**Figure 1** Four-chamber echocardiography view showing the LBBP lead deep into the interventricular septum (A). Right angiography showing the leads and severe tricuspid valve regurgitation (B). TE during the procedure showing lead-related severe tricuspid regurgitation (C). Fluoroscopy view during removal of the LBBP lead by gentle manual traction with counterclockwise rotations under TE guidance (D). Post-procedural TE revealed no evidence of interventricular septal defect (E). Removed LBBP lead (SelectSecure 3830, 69 cm, Medtronic Inc., Minneapolis, MN, USA). Note the absence of tissue attachments at the tip (F). ICD, implantable cardioverter-defibrillator; LBBP, left bundle branch pacing; RA, right atrium; TE, transesophageal echocardiography.

We believe the tensile strength of the LBBP lead allows the use of powered tools without the need for a locking stylet due to the lead design. However, we suggest to remove the LBBP lead after removing other leads with severe adherence, avoiding increased strain on the styletless lead.

Currently, experience is limited to a single case report recently published.<sup>3</sup> Our report highlights and confirm the safety and efficacy of lead removal from the deep septal LBB location using simple manual traction with counterclockwise rotation.

## Supplementary material

Supplementary material is available at *Europace* online.

**Conflict of interest:** none declared.

## References

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