

## EP CASE REPORT

# Fist in man implantation of a leadless pacemaker in the left atrial appendage following Mustard repair

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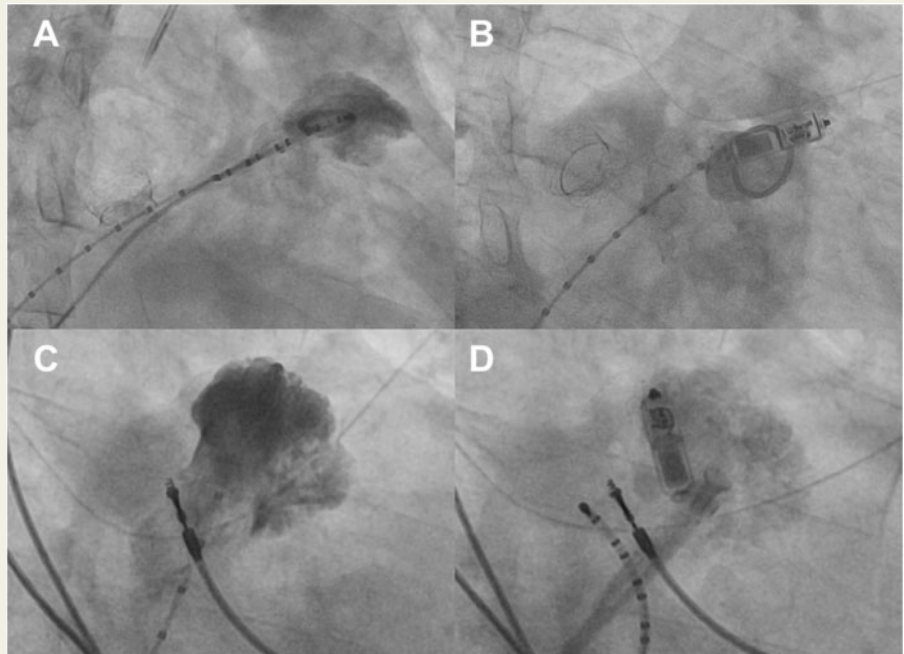
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## Introduction

Leadless pacing is an attractive technology for atrial redirection patients in whom sinus node disease is common and transvenous pacing potentially problematic.

Whilst implantation has been described in the subpulmonary ventricle in these patients,<sup>1</sup> ventricular pacing leads to dysfunction of the systemic right ventricle and although a dedicated leadless atrial device has been implanted in swine it remains experimental.<sup>2</sup> We describe the successful implantation of a leadless Micra™ (Medtronic, USA) pacemaker in the left atrial appendage of two patients previously treated with Mustard repair.



**Figure 1** Selective injections of left atrial appendage (A and C) and final position (B and D) in Cases 1 and 2.

## Case presentation

### Case 1

A 47-year-old man with Mustard repair, sinus node disease and previous venous baffle stenting. The presentation was with a syncopal event on the background of increasing exertional dyspnoea and presyncope with bradycardia and pauses but no atrioventricular block on ambulatory monitoring.

### Case 2

A 49-year-old man with Mustard repair and previous transvenous dual-chamber pacing for sick sinus syndrome with resultant superior vena caval occlusion and failure to capture of the atrial lead.

## Procedure

Both patients were consented to the off-label use of the device and offered alternatives of ventricular Micra or transvenous pacing (in Case 1). Both cases were performed under general anaesthetic. Venous access was obtained from the left femoral vein and a 24-Fr Drysheath™ (Gore, USA) was inserted. Following this, pace mapping of various locations in the appendage was performed to exclude phrenic nerve capture. A Micra™ (Medtronic, USA) device was then implanted using the integrated delivery catheter (see Figure 1). In Case 1, acceptable

parameters were achieved on first deployment (threshold 0.38 V at 0.24 ms, p 4.5 mV). Multiple recaptures were required in Case 2 but ultimately acceptable pacing parameters were achieved (threshold 0.5 V @0.24 ms, p 1.9 mV). Stability was tested using standard manoeuvres. Both patients were anticoagulated prior to implant for separate indications and this was restarted at 48 h. Clinical follow-up at 6 weeks has again shown excellent pacing parameters in both patients.

## Discussion

These are to our knowledge the first described cases of leadless pacemaker implant in the atrium. Whilst issues of device longevity and replacement and the potential for device thrombosis need to be considered, the anatomy of atrial redirection patients lends itself to leadless atrial pacing. The left atrial appendage is morphologically better suited to Micra™ implantation than the right given that it is generally longer, has a narrower neck and is more trabeculated.<sup>3</sup> This, coupled with the fact that it is readily accessed from the femoral vein, makes leadless left atrial appendage pacing a feasible and attractive solution for atrial switch patients who have sinus node disease in whom both transvenous and ventricular pacing are problematic.

**Conflict of interest:** N.M. is an employee of Medtronic plc. The other authors report no conflicts.

## References

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