

EP CASE REPORT

Simultaneous pacing of left anterior/posterior fascicular areas as an alternative to left bundle branch pacing: a case report

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Introduction

Compared with His-bundle pacing, the left bundle branch pacing (LBBP) is relatively simple and obtain stable pacing parameters, making it a good choice for heart failure patients with left bundle branch block¹. But in some special cases, the effect of LBBP is not ideal and have to choose an alternative. Here presented a case using simultaneous pacing of left anterior fascicular areas (LAFa) and left posterior fascicular area (LPFa).

Case presentation

A 68-year-old man was diagnosed with heart failure, complete atrioventricular (AV) block, and right ventricular (RV) escape rhythm (Figure 1A). After admission, LBBP to synchronize left and right ventricular contraction was planned. The patient underwent a mechanical aortic valve replacement 6 years ago. By taking the metal valve as a reference, the left bundle branch area (LBBa) is shown in Mark 6 of Figure 1B. Repeated attempts to spin into this area with Medtronic 3830-69 electrode were unsuccessful, considering the formation of local fibrous scar after valve ring implantation, the surgical scheme was changed to left ventricular (LV) epicardial pacing. However, repeated attempts to enter the coronary sinus also failed, which may be related to the changes of local anatomical structure after the surgery. Finally, in order to stay away from the scar under the metal valve, it was proposed to use LAFa and LPFa synchronous pacing instead of conventional cardiac resynchronization therapy (CRT). Under the guidance of a C315-His sheath, two 3830-69 electrodes were successfully rotated into the LAFa and LPFa (Figure 1B, Mark 3 and 4), and the

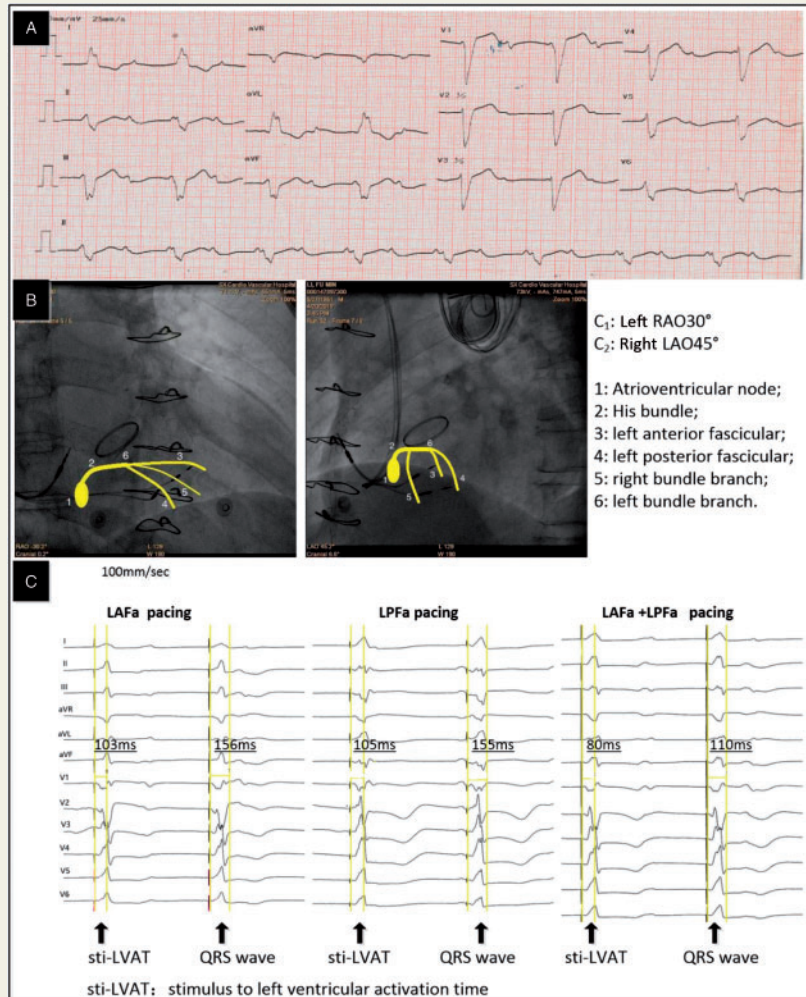


Figure 1 (A) Electrocardiogram before the pacing implantation, showed complete atrioventricular block and right ventricular escape rhythm. (B) Fluoroscopy at RAO 30° and LAO 45°. The yellow line showed the estimated trend of conduction bundle. The mark in the figure shows the estimated location of left bundle branch (Mark 6) and left anterior/posterior fascicular (Mark 3/4) and other important structure. (C) Electrocardiogram after operation. The right bundle branch pattern was obtained by synchronous unipolar pacing left anterior and left posterior electrode, with a threshold of LAFa and LPFa pacing were 1.0 V/0.5 ms and 0.7 V/0.5 ms, respectively. LAFa, left anterior fascicular area; LAO, left anterior oblique; LPFa, left posterior fascicular area; RAO, right anterior oblique.

electrocardiogram of right bundle branch pattern was obtained by synchronous unipolar pacing left anterior and left posterior electrode (Figure 1C). The threshold of LAFa pacing and LPFa pacing were 1.0V/0.5 ms and 0.7V/0.5 ms, separately (Figure 1C). Then, the right atrial electrode of Medtronic 5076-58 was implanted. The LAFa, LPFa, and right atrial (RA) electrodes were separately connected to the RV, LV, and RA port. Finally, Medtronic C2TR01 was implanted successfully. The whole operation took 2 h and 58 min, and the fluoroscopy time was about 26 min.

Discussion

Cardiac resynchronization therapy has proven to improve quality of life, reduce heart failure hospitalization, and prolong life in selected heart failure patients with reduced ejection fraction². For patients with CRT indications, LBBP is a novel pacing strategy, which can partially replace left ventricular lead. The safety of LBBP was confirmed in the report³. However, in some special cases, LBBP is difficult to implement. In this case, we adopted simultaneous pacing of LAFa and LPFa for the treatment of heart failure combined with complete AV block and RV escape rhythm. The pacing lead parameters were stable, and the patients' daily activity endurance increased significantly during the 6-month follow-up. The left ventricular ejection fraction increased to 51% at 6 months' follow-up (which is 31% before operation). The left ventricular end-diastolic diameter notably decreased from 69 mm to 59 mm, N-terminal pro B-type natriuretic peptide reduced from 2650 ng/L to 450 ng/L. However, the pacing effectiveness and safety of the LAFa and LPFa need to be further studied in large random samples.

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Conflict of interest: none declared.

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