Clinical benefits of left bundle branch pacing in patients with left bundle branch block: a multicenter, prospective study

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Introduction: His bundle pacing (HBP) could correct left bundle branch block (LBBB) and improved the cardiac function, however it often requires high pacing output. To assess the clinical benefits of left bundle branch pacing achieved by capture left conduction system via a novel intraseptal technique (iLCSP) to deliver cardiac resynchronization therapy (CRT).

Methods: Patients with LBBB indicated for CRT or pacing therapy from multicenters were included. iLCSP was performed by advancing the MDT 3830 lead deep into the septum about 1 cm distal to the His bundle region. Left ventricular ejection fraction (LVEF), left ventricular end-systolic volume (LVESV) and New York Heart Association (NYHA) functional class were assessed.

Result: A total of 94 patients aged 68.3±10.7 years were included. Permanent iLCSP was successfully achieved in 92 patients. In patients who completed 1-year follow-up, LVEF improved from 38±14% to 56±11% (P<0.001). In patients with LVEF>35%, LVEF increased from 51±12% to 60±10% at 1 year (P<0.001). In those with baseline LVEF≤ 35%, a greater magnitude of LVEF improvement was observed from 28±5% to 48±9% at 6 months (n=42, p<0.001,) and from 29±5% to 53±10% at 1-year follow-up (p<0.001). LVESV decreased significantly (P<0.001). The NYHA functional class improved significantly from 3.1±0.5 to 1.5±0.6 at 6 months follow-up (P<0.001). BNP levels improved from 3.0±0.6 to 2.1±0.7 and cardiothoracic ratios also decreased from 0.62±0.06 to 0.56±0.06 at 6 months (All P<0.001). There were no other complications such as infections, embolism or stroke associated with the implantation and heart failure related rehospitalization.

Conclusion: Permanent iLCSP is effective and safe in patients with LBBB. Permanent iLCSP results in an improved cardiac function in patients with LVEF≤35% and preserve cardiac function in those with LVEF>35%.