Reasons for Unsuccessful His Bundle Pacing in Low Volume Centre: A Single Center Study

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Introduction: His bundle pacing (HBP) restores normal electrical activation of ventricles. Meta-analysis has shown that the average implant success rate was around 84.8%. In our institution, the success rate was around 77.8%. Accordingly, we sought to identify the reasons for unsuccessful HBP during implantation procedure.

Methods: Data of 27 consecutive patients who underwent HBP from August 2018 to February 2019 were retrospectively obtained from Changi General Hospital. We reviewed clinical and reason for unsuccessful HBP at time of implantation. Immediate HBP implantation success was defined as successful implantation with adequate pacing threshold.

Result: On average, 4 patients underwent HBP per month. All HBP was attempted using the Medtronic C315His performed sheath and exposed helical screw Select Secure 3830 lead. 51.8% of the patients were female averaging 74.3 years old. The average left ventricular ejection fraction was 55.4%. The indications for HBP were atrioventricular block (n=62.9%), sick sinus syndrome (n=33.3%), and biventricular pacing (n=3.7%). Immediate technical success was achieved in 21 patients (77.8%), whereby 4 patients had both selective (SHB) and non-selective His bundle (NSHB) capture, 16 patients with NSHB capture and 1 patient with SHB capture. The average NSHBP and SHBP threshold were 1.72V@1ms and 0.6V@1ms respectively at implant. 6 patients (22.2%) had unsuccessful HBP lead placement. Transthoracic echocardiography prior procedure in all these patients showed normal right atrial and right ventricular size. Majority of the unsuccessful cases (5 patients, 83.3%) occurred in patients with high grade AV block or complete heart block. The main reason for unsuccessful HBP lead placement was high pacing threshold, >5V at 1.0ms (3 patients, 50.0%). This was followed by absent of His signal (2 cases, 33.3%) and unstable His lead position resulting in recurrent dislodgement (1 case, 16.7%). Half of these patients subsequently received right ventricular septal pacing and the other half received right ventricular apical pacing. At 6 months follow up, pacing threshold remained stable in all patients.

Conclusion: The main reason for unsuccessful HBP was high pacing threshold (50.0%) followed by
absent of His signal and unstable His lead position.