A MIDTERM ASSESSMENT OF LV FUNCTION USING 3-D SPECKLE TRACKING ECHO AND PACING PARAMETERS IN SELECTIVE HIS BUNDLE PACING vs RV APICAL PACING PATIENTS

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Introduction: Recent studies have demonstrated that right ventricular apical (RVA) pacing has a deleterious impact on left ventricular function. His bundle pacing (HBP) is a physiological alternative to RVA. This study sought to evaluate the mid-term effects of HBP vs RVA by 3D speckle echo by GLS and compare the lead parameters at 6 months post-implantation.

Methods: Selective HBP candidates (n = 36) were compared to RVA apical pacing candidates (n = 38) who met class I or class IIa indications for pacemaker implantation as given by the American College of Cardiology Foundation/American Heart Association and the Heart Rhythm Society updated guidelines. The state in which the QRS duration was as narrow as the intrinsic duration during relatively low output but was wider during high output was considered to be SHBP. All patients underwent 3D speckle echo (Global longitudinal strain) at the time of implantation and 6 months post procedure. Pacing parameters such as pacing threshold, lead impedance, and sensing amplitude were tested after lead fixation and after 6 months post procedure.

Result: GLS in the RVA pacing was -17.18 with SD of 2.06 at the time of the procedure, 6 months post procedure there was a significant reduction in the GLS (-16.33 with SD of 1.96) with P value < 0.001. There was no difference in the LV ejection fraction between the two groups. Stimulation thresholds were 1.12 +/- 0.47 in the HBP at the time of implantation, the thresholds at 6 months post procedure significantly increased to 1.56 +/- 1.30. In comparison, RVA stimulation thresholds were 1.06 +/- 0.74 at the time of implantation and decreased to 0.96 +/- 0.29 6 months post procedure. The lead impedance of the HIS lead was 774.56 with SD of 179.75 at the time of implantation and the impedance decreased to 589.89 with SD of 114.80 at 6 months follow up. The RV lead had an impedance of 750.95 with SD of 136.96, the impedance decreased to 609.20 with SD of 145.17. No significant differences were detected between the two groups during the 6-month observation. The R-wave amplitudes were relatively lower in the SHBP group at baseline (5.8 +/- 2.3 vs 10.2 +/- 4.8 mV) and were stable 6-month follow-up visits. No differences were noted in ventricular pacing (%) during follow-up. The QRS duration was significantly narrower in the HBP group compared to the RVA pacing group.

Conclusion: In conclusion, the RVA group had a significant reduction in GLS 6 months post procedure, The HBP group had stable GLS, a significantly narrower QRS duration, with increased stimulation thresholds, and the R wave amplitude was significantly lower in the HBP group compared to the RVA pacing group.