Evaluation of paced QRS reduction with alternative right ventricular site pacing

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Introduction: Direct His-Bundle pacing (DHBP) and RV Septal pacing provides most physiological form of ventricular activation when compared to RV Apical pacing. The purpose of this data collection was to share our experience on QRS narrowing with DHBP and Modified high RV septal pacing (mRVSP) at our Institute using conventional screw-in leads since additional tools required for accessing these sites would raise overall cost of procedure.

Methods: We performed 12 consecutive cases in this series; DHBP and mRVSP (6 each) using conventional active fixation leads. All patients had conventional Atrio-ventricular synchronous pacing indication. HB was approached using standard Abbott pacing lead Tendril STS 2088TC-58 by reshaping conventional stylet to precisely position lead at a site near HB with support from fixed shape CPS Direct™ Universal Outer Catheter (DS2C019) from Abbott. The HIS potential was confirmed electrophysiologically by demonstrating largest His deflection on Prucka GE CardioLab Electrophysiology Recording System and confirmed using unipolar signals in Merlin Pacing System Analyser EX3100 from Abbott. The helix was extracted to maximum while maintaining a counter clockwise torque in the stylet. mRSVP technique ensures highly accurate reproducible stable positioning and relies on anatomical identification of target zone in LAO view fixed shape CPS Direct™ Universal Outer Catheter (DS2C019) from Abbott. We used Abbott 7Fr. Therapy Ablation catheter (83456) to stabilise sheath and tried penetrative force to allow catheter to partially puncture Ventricular septum. We used standard Abbott pacing lead Tendril STS 2088TC-58 and did deep penetration using maximum screw in turns while maintaining the clockwise torque on catheter to maintain orientation of lead tip perpendicular to septal surface and provide adequate support to rapidly screw-in lead into septum.

Result: All 6 patients in DHBP had capture threshold <2.5 V at 0.4ms. Patients in mRVSP showed relatively high acute thresholds 1.5-2.5 V at 0.5ms which stabilised to <1.0 V at 0.5 ms on subsequent day of implant. Post-implant QRS duration was reported to be 105-135ms and 110-140 ms in DHBP and mRSVP patients respectively. We found 9 out of 12 patients had QRS narrowing at first attempt while 3 patients were switched to alternate site pacing.

Conclusion: From our experience, mRVSP positioning was relatively easier to achieve than DHBP. Both techniques demonstrated reduction in Paced QRS. The current tools are not best suited for either techniques and would require further learning. Long term follow-up data would be needed to confirm which technique helps to achieve stable thresholds and long term clinical outcome.