Implementation of a HIS Bundle Pacing Program at Two Australian Centres: Learning Curve and Initial Experience

Luke Dawson
Julie Cadden
Derk Pol
Irene Stevenson

Introduction: HIS Bundle Pacing (HBP) has emerged as a promising technology to avoid pacing complications associated with dyssynchrony in right ventricular (RV) pacing. There are limited Australian data on HBP and most international data are limited to experienced operators and centres. We aimed to evaluate the implementation and outcomes of an HBP program in an Australian setting.

Methods: Data were retrospectively collected on 45 consecutive HBP procedures at two Victorian centres from commencement of the program in March 2018 to February 2019. The cohort was divided into three groups (cases 1-15, 16-30, and 31-45) to determine changes in procedural success over time in relation to operator experience.

Result: Mean age was 70 +/- 18 years, 69% were male. Impaired LV function was present in 27%, atrial fibrillation in 47%, 13% had a previous device, and 5% and 30% had a pre-existing right or left bundle branch block (BBB) respectively. Mean QRSD pre-HBP was 121 +/- 35 ms, mean procedure time was 120 +/- 53 minutes, and mean fluoroscopy time was 21 +/- 18 minutes. HBP was successful in 82% of procedures, but was less likely to be successful if AV block was the indication (70% vs 100%, p=0.02). QRSD decreased by 5 +/- 13 ms overall (increasing by mean 10 +/- 19 ms in patients without BBB, while decreasing by mean 21 +/- 44 ms in patients with BBB). Rates of procedural success, QRSD improvement, and use of an RV backup lead were 80%, 50%, and 40% respectively for cases 1-15, and 93%, 78% and 27% respectively for cases 31-45. Across the three groups, both procedural and fluoroscopy time changed reflecting operator experience (procedural time 114 +/- 30 minutes for cases 1-15, 143 +/- 64 minutes for cases 16-30, and 90 +/- 45 minutes for cases 31-45, p=0.05; fluoroscopy time 15 +/- 7 minutes for cases 1-15, 28 +/- 22 minutes for cases 16-30, and 8 +/- 3 minutes for cases 31-45, p<0.001). Figure 1 demonstrates an electrocardiograph with no change in QRS duration prior to HIS pacing (panel A) and following HIS pacing (panel B) in a patient with atrial fibrillation.

Conclusion: HBP has a high success rate and is feasible in an Australian setting with improvements in procedural performance and outcomes seen with operator experience. BBB appears to affect procedural success.