New Insights in Electrostimulation from Implantation to Follow-Up

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DEEP SEPTAL LEFT VENTRICULAR PACING VS HIS BUNDLE PACING: A SINGLE-CENTER EXPERIENCE COMPARISON

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Introduction: Right ventricular apical pacing (RVAP) causes ventricular dyssynchrony, impairing ventricular function. Biventricular pacing (BVP) improves on RVAP but still has a non-physiological activation pattern. Alternative pacing sites like His Bundle Pacing (HBP) and Left Bundle Branch Area Pacing (LBBaP) address this issue. However, HBP implantation has higher capture thresholds and longer procedures, increasing peri-procedural risks and reducing battery life. LBBaP, defined by MELOS study, resolves the capture threshold issue but may not consistently achieve successful implantation due to strict electrocardiographical signs of success. Deep Septal Left Ventricular Pacing (DSLVP) is an alternative, but more studies are needed.

Aim: This study compares HBP and DSLVP, assessing their hemodynamic impact on left ventricular systolic function over a year through semestral re-evaluation. We also evaluate implantation success rates, capture thresholds, and sensing amplitude during follow-up.

Methods: This observational retrospective study included 51 patients eligible for bradycardia/resynchronization therapy according to guidelines. Among them, 35 received successful HBP implants, while 16 initially underwent BVP failure and later received DSLVP based on individual anatomic considerations. Patients underwent follow-ups at 6 months and 1 year, where we collected echocardiographic data, capture thresholds, and sensing amplitudes.

Results: Both pacing systems demonstrated a comparable increase in Ejection Fraction (EF) from implantation to the end of the follow-up period (HBP: 40% to 46%, p < 0.47; DSLVP: 40% to 48%, p < 0.01). DSLVP did not significantly narrow QRS duration before and after implantation (146 ms vs. 136 ms, p = 0.2). HBP had a 97% implantation success rate (34 out of 35 patients), while DSLVP achieved a 100% success rate (16 out of 16 patients). Capture thresholds and sensing amplitudes remained satisfactory for both techniques, with no significant increases during follow-up (DLVSP: 0.55 V vs. 0.58 V, p > 0.05; HBP: 1.24 V vs. 1.38 V, p > 0.05). However, HBP had significantly higher capture thresholds than DSLVP at both implantation (0.55 V vs. 1.24 V, p < 0.002) and follow-up (0.58 V vs. 1.38 V, p < 0.01).

Conclusion: DSLVP offers comparable hemodynamic benefits at implantation and post-implantation results to HBP. Lower capture thresholds in DSLVP extend battery life, making it a valid alternative to HBP.