Elementary analysis of His-Purkinje system pacing in patients who underwent cardiac resynchronization therapy with failure of the LV lead placement via coronary sinus

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Introduction: His-Purkinje system pacing (HPSP) is a physiological pacing therapy. We aimed to explore the clinical application of in patients who underwent cardiac resynchronization therapy (CRT) with failure of the LV lead placement via coronary sinus (CS).

Methods: Pacing parameters and cardiac function indicators of 7 CRT patients undergoing HPSP with failure of the LV lead placement successfully from December 2017 to March 2019 were retrospectively analyzed in this study.

Result: Among them, 3 underwent His-bundle pacing, another 4 underwent left bundle branch area pacing. The His-bundle (HB) capture threshold was $2.03 \pm 0.42\text{V}/1.0\text{ms}$ at implant and $2.00 \pm 0.35\text{V}/1.0\text{ms}$ at 3-month follow-up. However, the LBBAP capture threshold was $0.75 \pm 0.25\text{V}/0.4\text{ms}$ at implant and $0.63 \pm 0.10\text{V}/0.4\text{ms}$ at 3-month follow-up. Besides, the average QRS duration ($175.7 \pm 13.5 \text{ vs } 125.4 \pm 9.6\text{ms}; P<0.001$), left ventricular ejection fraction ($31.7 \pm 6.6 \text{ vs } 41.0 \pm 6.4\% ; P=0.005$), left ventricular end-diastolic diameter ($71.0 \pm 6.9 \text{ vs } 63.0 \pm 7.4\text{mm}; P=0.001$) and six-minute walk distance test ($306.6 \pm 32.5 \text{ vs } 391.9 \pm 69.8\text{m}; P<0.001$) were significantly improved at 3-month follow-up.

Conclusion: HPSP, as an alternative for patients undergoing CRT with failure of LV lead placement, can ameliorate electrical dyssynchrony and improve cardiac function in patients with heart failure.