Effect of Intrinsic QRS Morphology on Response to His-Purkinje System Pacing in Atrial Fibrillation Patients with Atrioventricular Node Ablation

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Introduction: Studies have demonstrated clinical benefits of His-Purkinje system pacing (HPSP) combined with atrioventricular node (AVN) ablation in atrial fibrillation (AF) patients with narrow QRS. This study aimed to assess the effect of different intrinsic QRS morphology on HPSP response.

Methods: From Aug 2012 to Dec 2018, AF patients who were screened for AVN ablation and permanent HPSP were included. Intrinsic QRS morphology and pacing parameters were recorded. Echocardiographic left ventricular ejection fraction (LVEF), left ventricular end systolic volume (LVESV), cardiothoracic ratio (CTR) were assessed before implantation and during follow-up.

Result: A total of 259 patients were enrolled (age 70±10 years; ICM 13%; NICM 58%; LVEF 42±15%), of them, 239 (92.3%) patients received permanent HPSP and AVN ablation with a mean 25±19 months follow-up time. We divided the patients with permanent HPSP into three groups according to their intrinsic QRS morphology: group 1 (n=183): intrinsic narrow QRS or RBBB pattern, group 2 (n=36): LBBB pattern and group 3 (n=20): IVCD. In those with reduced baseline LVEF who had implanted permanent HPSP more than 1-year, LVEF improved from baseline of 31±6% to 48±14% at 1-year follow-up in group 1 (N=46, P <0.001), from 31±5% to 57±10% in group 2 (N =16, P<0.001) and from 31±6% to 38±10% in group 3 (N =11, P=0.049), with the highest improvement in group 2. The similar improvements were observed in LVESV and NYHA function class.

Conclusion: Permanent HPSP combined with AVN ablation significantly improved cardiac function in AF patients with different intrinsic QRS morphology, especially in LBBB.