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Outcome of 3D electroanatomic mapping-guided permanent pacing in parahisian and septal pacing sites in children.

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Introduction: Right ventricular (RV) parahisian, mid septum, outflow tract (PHP-MS-RVOT) pacing sites have been proposed to prevent pacing-induced left-ventricular (LV) dysfunction. 3D-electroanatomic mapping systems (EAM) guide cardiac catheter navigation and reduce fluoroscopy during procedures. The aim of the study was to evaluate the results of EAM-guided pacemaker system implantation (PMI) in PH-MS-RVOT in pediatric patients.

Methods: Children/adolescents with complete atrioventricular block (CAVB) and no other congenital heart defects prospectively underwent EAM-guided PMI into PH-MS-RVOT. With EAM, a geometric reconstruction of right heart was initially performed; then a pacing map identified RV septal sites with narrower paced QRS complex. The maps obtained guided the implantation of atrial/ventricular leads. ECG, LV contractility (ejection fraction, EF, Global Longitudinal Strain, GLS) and synchrony (Systolic Dissynchrony Index, SDI, Septal to Posterior Wall Motion Delay, SPWMD, Interventricular Delay, IVMD) were evaluated before and after implantation, up to 2 years. Data are reported as mean±SD. *P<0.05 was significant*.

Results: Twenty patients (15 females), 9.9±3.9 years, 35±16 kg, 138±23 cm, underwent PMI (13 VVIR, 7 DDD) in PHP-MS-RVOT (respectively, 7-11-2 patients). Procedure time (167±38 minutes) and radiation exposure (4.8±3.1 mGy, 114±83 microGy/m2) were recorded. DDD patients were older than VVIR (14±2 years vs. 7±2, P<0.001), *had longer procedure time (200±35 min. vs. 150±26, P=0.002) and exposure (7±4 mGy vs. 3.6±2.0, P=0.015).* One ventricular lead dislodged and was repositioned (censored). QRS duration increased significantly after implantation, LV EF and synchrony were normal throughout follow-up without significant variations (table 1), pacing was 100%. No significant differences were observed between patients with DDD-VVIR, and PHP-MS-RVOT.

Conclusions: EAM-guided PMI in PH-MS-RVOT in pediatric patients showed preserved LV function at 2 years follow-up.

Table 1	QRS ms	EF %	SDI ms	SPWMD ms	IVD ms	GLS %
Pre-implant	89±23*	64±11	/	/	/	/
Post-implant	108±12* P=0.004	61±6	2.9±2.2	90±24	18±13	-23 ± 3
1 Year	/	62±7	1.7±0.7	87±24	23±8	-23 ± 3
2 Year	/	60±6	2.7±1.1	92±24	20±15	-23 ± 2