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TREATMENT OF PAEDIATRIC ATRIAL TACHYCARDIA ORIGINATING FROM ATRIAL APPENDAGES BY RADIOFREQUENCY CATHETER ABLATION UNDER THREE DIMENSIONAL ELECTROANATOMIC MAPPING SYSTEM COMBINED WITH APPENDECTOMY

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Objectives To evaluate the electrocardiographic characteristics of atrial tachycardia (AT) originating from atrial appendages in children and to investigate the effects of radiofrequency catheter ablation (RFCA) under guidance of CARTO system and appendectomy.

Methods Of the 17 children with incessant AT receiving RFCA under CARTO system in our electro cardiac lab, five were diagnosed as AT originating from atrial appendages, age 8.1 ± 4.6 (3.2~12.8) years. Male:Female 1:4. AT appeared to be incessant in all of these five children, resisting to diverse antiarrhythmic drugs or only minimal effects were gained. Decreased cardiac systolic function were detected in four children (80%) whose left ventricular ejection fraction (LVEF) were 44%~50%. Electroanatomical mapping under CARTO system revealed atrial appendage origin for these five children, RFCA by cooled tip catheter (Navi-Star THERMO COOL) were performed at the location of earliest AT origin. We investigated the P' wave configurations in electrocardiogram of this AT type and effects of RFCA. Appendectomy was used for patients with AT recurrence after RFCA, and effects of this surgical procedure were evaluated.

Results Increased focal automaticity was regarded as electro physiologic mechanism for AT originating from atrial appendages proved by CARTO mapping. Three from right atrial appendage

(RAA) and two from left atrial appendage (LAA). P' wave configuration for AT from RAA: (1) positive P' wave in I and aVL leads; (2) positive P' wave in II, III and aVF leads; (3) negative and double-peak P' wave in V1 lead. P' wave configuration for AT from LAA: (1) negative P' wave in I and aVL leads; (2) positive P' wave in II, III and aVF leads (3) positive P' wave in V1 lead (1 case) or bidirectional P' wave with positive tendency (1 case). Immediate success rate for RFCA was 100%. three recurred (60%) during follow-up (5–14 months). Of these recurred, two originated from RAA (2/3, 66.7%) and one from LAA (1/2, 50%). Appendectomies were performed under general anaesthesia with beating heart, reversions to sinus rhythm were gained at time the appendages were incised. No recurrence was detected during 5–14 months' follow-up.

Conclusions (1) The electrocardiographic characteristics of AT originating from atrial appendages in children are unique. (2) RFCA under CARTO mapping system by cooled tip catheter is safe and effective for AT originating from atrial appendages in children while recurrence rate is high. (3) Appendectomy for AT originating from atrial appendage is reliable, while the assurance of AT origin by CARTO mapping system should be gained preoperatively.