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Catheter ablation for tachyarrhythmia in children. The impact of Electroanatomic Mapping Systems on Fluoroscopic Exposure Reduction

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Objective: Retrospective study aimed to describe the results of catheter ablation for SVT in children<17 years at a single institution during the period 2013–18 and to compare the safety and efficacy of procedures with and without electroanatomic mapping system guidance.

Patients and Procedures: 98 consecutive patients who underwent a total of 106 catheter ablation procedures were included (9 with cryoablation and 97 with radiofrequency energy). Median age was 11,1 years (range 0,1 to 16,9 years) and median weight was 45 kg (0,3 to 80 kg). 57 were males. Congenital heart disease was present in 6 patients. Arrhythmia substrates was Wolff–Parkinson–White syndrome in 42, concealed accessory pathway in 27, atrioventricular nodal re-entry tachycardia in 23, permanent junctional reciprocating tachycardia in 3, focal atrial tachycardia in 3. 63 procedures (group 1) were performed only under fluoroscopic guidance and 43 (group 2) using an electroanatomic mapping system (Carto or NavX).

Results: The acute success rate was 95% and 98% when including repeat procedures. Arrhythmia recurrence occurred in 5 patients (5%). 3 complications were observed: 1 pericardial effusion and 2 Wenckebach atrioventricular block that spontaneously regressed. The acute success did not differ between group 1 and 2 (p 0,629) and no difference was registered in procedure time (median 104 versus 100 minutes, p 0,7). Complication rate did not differ significantly between groups (p 0.56), although the incidence was higher in group 1 (3 cases versus 0 in group 2). Fluoroscopic exposure was significantly reduced in group 2 compared to group 1 (median 0,7 versus 11,2 minutes; p<0,001). Catheter ablation was completely performed without fluoroscopy in 17 patients.

Conclusion: Catheter ablation can be undertaken in children with a high success rate, few recurrences and complications. Non-fluoroscopic electroanatomic mapping can significantly reduce the radiological exposure. This is especially important in children as radiation can be potentially more harmful in younger individuals.