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Safety of transseptal puncture procedures in pediatric patients weighing ≤ 15 kg

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Objectives: Transseptal puncture (TSP) is a routinely used approach to the left heart in cardiac interventions. The most common complication after TSP is pericardial effusion (PE). Few data exist on safety of TSP in infants and small children.

Methods: Retrospective data analysis from all patients ≤ 15 kg who had TSP at our institution from 10/02 to 01/18. We evaluated diagnosis, biometrics, procedure time, fluoroscopic time, and complications. Complications were defined as any incidents attributable to TSP requiring additional diagnostic and /or therapeutical measures beyond standard of care. Procedures with access to the left heart through a patent foramen ovale and patients with other than normal bi-atrial anatomy were excluded. All TSP were performed using standard Brockenbrough needle under fluoroscopic guidance. Biplane X-ray in right anterior oblique (30°) and left anterior oblique (60°) projection was used in all patients.

Results: 23 patients with a body weight of ≤ 15 kg (female, $n=10$, 43%) had TSP in a total of 26 cardiac catheterization procedures. 3 individuals had TSP twice. TSP indication was catheter ablation of left sided accessory pathway (AP) in 11/23 (48%) and hemodynamic compromise (such as pulmonary vein stenosis) in 12/23 patients (52%). At TSP, median age was 1.0 (range 0-4.9) years, median body weight was 8.1 (range 1.8-15.0) kg, median procedure time was 215 (range 67-425) min. and median fluoroscopy time was 20.4 (range 3.7-66) min. Patients requiring TSP for hemodynamic reasons were smaller than patients receiving TSP for ablation (6.8 vs. 10.8 kg, $p=0.014$). 3/12 patients (25%) requiring TSP for hemodynamic reason developed PE after TSP with 2 patients requiring pericardiocentesis/ thoracotomy. In the remaining patient, PE resolved without further therapy. No patient receiving TSP for catheter ablation developed PE. There was no TSP associated death.

Conclusions: TSP in children ≤ 15 is feasible. However, PE after TSP was associated with lower body weight and the presence of hemodynamic compromise.