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Cryoablation of Mahaim Pathways in Children

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Introduction: Cryoablation is a safe and effective alternative to radiofrequency ablation (RFA) for many cardiac arrhythmias. Main advantages of cryoablation include cryomapping and increased catheter stability. Mahaim pathways (MPs) are characterized by decremental atrioventricular node like conduction properties and are involved in antidromic AV reciprocating tachycardia. The aim of this study was to report the initial experience of cryoablation of MPs in children.

Methods: Between January 2010 and November 2011, 358 patients underwent electrophysiological studies. Patients with the MPs were reviewed in this study. These patients underwent either RFA or cryoablation. A three-dimensional, surface electrode-based navigation system (EnSite NavX™, St.Jude Medical Inc., St. Paul, MN, USA) was used in all procedures.

Results: A total of 8 patients underwent catheter ablation for MPs. The median age was 10 years (range: 8 -16). The median weight was 55 kg (range: 31- 80). There were 6 males and 2 females. Locations of the MPs were at the right lateral (n=2) and right posterolateral (n=6) tricuspid annulus. Mapping was based on the finding of a specific Mahaim potential in 5/8 patients. One patient underwent successful ablation with RFA. Cryoablation was performed in 7 patients. In 2 of these patients initial attempt with RFA failed and cryoablation was successful. In 1 patient neither RFA nor cryoablation was effective. The acute success rate was 88% (7/8). A 6-mm tip cryoablation catheter was used in 2 patients and an 8-mm tip cryoablation catheter was used in 5 patients. The median fluoroscopy time was 2.9 minutes (range: 0 - 14.6). The median procedure time was 250 minutes (range: 170 - 420). There was one minor procedure-related complication. No major complications were observed. Arrhythmia recurrence was noted in 2/7 patients. One of these patients was successfully treated using an 8-mm tip cryoablation catheter resulting in a long-term ablation success rate of 84% (6/7 patients).

Conclusions: Cryoablation appears to be a safe and effective alternative therapy in children with MPs. Further studies are needed to assess the efficacy and safety of cryoablation in comparison to RFA.