

**Figure 1.** The patient's initial chest X-ray was normal (A). But on the chest X-ray taken next day; there was perihilar consolidations, increased width of vascular pedicle and peribronchial cuffing due to the newly occurring pulmonary edema (B).

cium gluconate and glucagon are considered as possible adjuvant therapy for CCB toxicity (3, 6, 7). According to currently available data these therapies should be considered for the refractory cases (7). Owing to high protein binding and extensive tissue distribution of CCBs hemofiltration or dialysis are not useful in overdose cases (4).

Physicians should be aware that patients may not be telling the truth every time. Especially in some psychiatric disorders such as factitious disorder (Münchausen syndrome); patient may act as if he/she has an illness by deliberately producing or exaggerating symptoms by taking drugs with overdoses (8). Factitious disorders are not rare psychiatric disorders and many clinicians may encounter them during their career. Our patient can be considered as malingering, because he had false physical symptoms intentionally produced and motivation of the behavior involved external incentives. Whereas factitious disorder has no other incentive than to be a patient and experience the sick role (8, 9).

## Conclusion

This report underlines that the reliability of anamnesis should be questioned in complicated, suspicious shock cases with unknown origin. Drug overdoses and psychiatric disorders should be kept in mind in such suspicious patients.

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## Successful elimination of a Mahaim pathway using an 8 mm tip cryoablation catheter in a child

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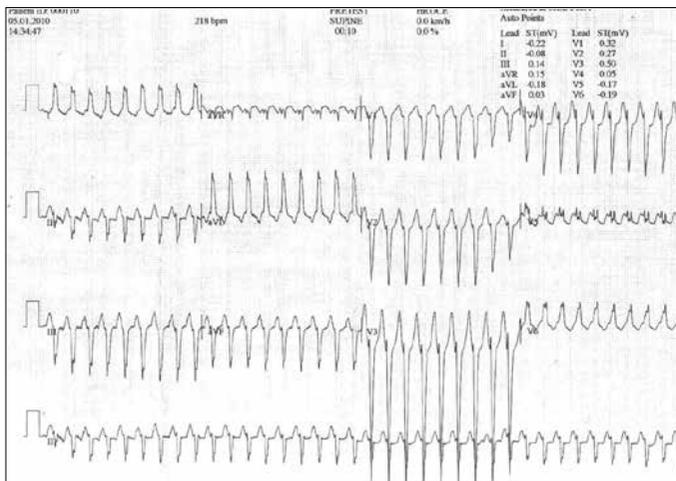
### Introduction

Mahaim fibers typically demonstrate decremental conduction properties and constitute approximately 3% of preexcitation syndromes (1). Mahaim pathways are usually right-sided, however several left-sided cases have been reported (2). Conventionally Mahaim pathway ablation is performed with radiofrequency ablation (RFA). We report a patient who presented with a wide QRS tachycardia with left bundle branch (LBBB) pattern. The electrophysiology study demonstrated Mahaim tachycardia and the patient was successfully treated with cryoablation following a failed attempt with RFA.

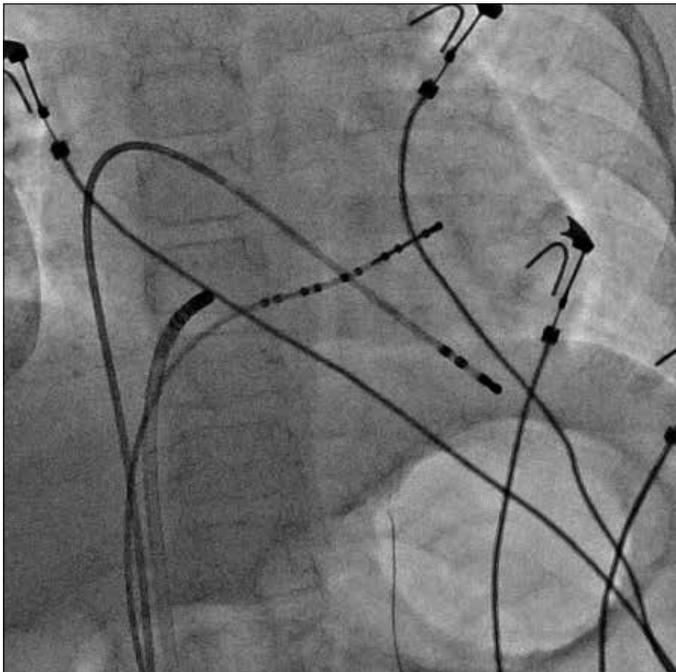
### Case Report

An 8-year-old girl was referred to our clinic with the preliminary diagnosis of ventricular tachycardia. Her palpitations started at the age of 2. Metoprolol was started 2 months prior to the presentation, however tachycardia episodes continued. A resting 12-lead electrocardiogram showed no abnormalities. A 24-hour Holter monitoring demonstrated wide QRS tachycardia with leftward superior axis deviation and LBBB morphology. During the exercise test tachycardia was induced and the test had to be terminated due to sustained wide QRS tachycardia (Fig. 1).

An electrophysiology study was carried out under general anesthesia, following the parents' consent for the procedure. Two quadripolar catheters and a decapolar catheter (St. Jude Medical Inc., St. Paul, MN) were positioned at the high right atrium, coronary sinus and right ventricle. The Ensite Velocity system (St. Jude Medical Inc., St. Paul, MN) was used for mapping and navigation of the catheters. A wide QRS tachycardia with LBBB and superior axis started spontaneously. Intravenous adenosine was administered as 200 mcg/kg, resulting in sudden termination of the tachycardia. However, following a few ventricular escape complexes, sinus rhythm returned with pre-excitation with the same QRS morphology similar to that of during the tachycardia. With programmed ventricular stimulation, earliest ventriculoatrial conduction was observed in the His region with decremental properties. When the diagnostic catheter was at the His position, there was no His signal preceding the ventricular signal during the wide QRS tachycardia. All of these electrophysiological features were strongly suggestive

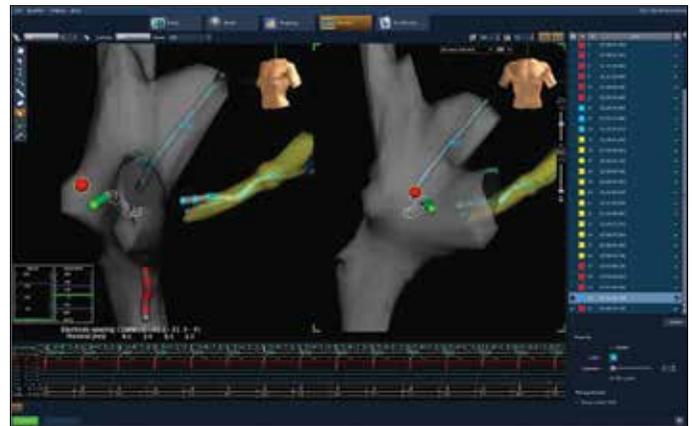


**Figure 1. Electrocardiogram tracing showed wide QRS tachycardia with leftward-superior axis and LBBB pattern during pretest period in Bruce protocol exercise test**



**Figure 2. The cryoablation location for the Mahaim pathway is shown in antero-posterior view in this Figure**

of a Mahaim pathway. Mahaim potential could not be identified around the tricuspid valve annulus. Therefore, ventricular pace mapping was done around the tricuspid annulus to locate the insertion site of the Mahaim pathway. Consequently, we induced the tachycardia with similar morphology in the right posterolateral area where pace mapping QRS morphology was very similar to that of during the tachycardia. Radiofrequency application was performed with a power of 48-55 W and temperature of 47°C for 30-60 sec at each successful ablation site. Radiofrequency applications were only temporarily effective despite good catheter stability. Therefore, we suspected a deeply seated epicardial pathway. After that an 8-mm tip cryocatheter (FreezorMax, Cryocath Technologies Inc, Kirkland, Canada) was used (Fig. 2). During cryoablation tachycardia terminated within 13 seconds (Fig. 3). Cryoablation was carried out 4 times for 4 minutes and once for 6 min-



**Figure 3. The ablation site (right posterolateral area) and catheter is shown in Ensite-NavX electroanatomic mapping system**

utes. Cryoablation was applied for total of 1320 seconds. There was no further conduction via the accessory pathway and tachycardia was not inducible by stimulation and metoprolol infusion. The procedure time was 180 minutes and fluoroscopy time was 2.1 minutes, at a dose of 5.2 mGy. She was discharged in normal sinus rhythm on the following day.

## Discussion

To our knowledge, this is the first report of successful cryoablation of a Mahaim pathway using an 8-mm tip cryocatheter following a failed attempt with RFA.

Mahaim potential can be mapped at the lateral tricuspid annulus in the majority of patients with Mahaim tachycardia and RFA at that site is associated with a high success rate (3, 4). In our case, Mahaim potential could not be recorded during the procedure, however due to the electrophysiological properties, Mahaim pathway was suspected and ablation was attempted. RFA failed to eliminate the Mahaim pathway in our patient. Parvez et al. (5) showed that lesion size created with an 8 mm tip cryocatheter is larger than lesion of open irrigated radiofrequency catheter. Potential advantages of 8 mm tip catheter are stability and effectiveness for deeper targets. Short-term results in patients with atrioventricular nodal reentry tachycardia showed that the use of 8 mm tip cryocatheter reduced recurrences (6). Due to mentioned properties above we used 8-mm tip cryocatheter and we achieved the elimination of Mahaim pathway.

## Conclusion

Conventionally Mahaim pathway ablation is performed with RFA. However, in patients with failed radiofrequency attempts, cryoablation with an 8-mm tip catheter can be an alternative approach.

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## Near zero fluoroscopy radiation exposure during successful catheter ablation of atrial tachycardia from the non-coronary aortic cusp using 3-dimensional electroanatomic mapping system

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### Introduction

Atrial tachycardia (AT) rarely originates from the paraHisian region (1). Catheter ablation of paraHisian AT carries a substantial risk of atrioventricular (AV) block. Cryoablation offers a safer ablation strategy for these patients (2). There is a small risk of AV block with cryoablation. Ablation of paraHisian AT from the non-coronary aortic cusp (NCC) is an option in these patients. We report a patient with paraHisian AT that was successfully ablated from the NCC by 3-Dimensional (3-D) mapping system with using near zero fluoroscopy (NZF).

### Case Report

A 62-year-old woman, was referred to our institution due to symptomatic supraventricular tachycardia. She had undergone paraHisian AT ablation from right atrium at another center one year ago. She had recurrence of AT after 3 months. At the time of her admission, electrocardiogram (ECG) during tachycardia revealed AT. Echocardiogram showed mild mitral regurgitation and normal left ventricular function. An electro-



**Figure 1. 3-D geometry of aorta was constructed by En-Site system**  
HB - his bundle; IVC - inferior vena cava; NCC - non-coronary cusp; RA - right atrium; SVC - superior vena cava



**Figure 2. Local atrial activity preceded onset of the P wave by 53 msec**

physiological (EP) study was undertaken. Multi-electrode catheters were positioned into His bundle region and coronary sinus and an electroanatomic mapping system was used (EnSite NavX® system, St. Jude Medical, Inc., St. Paul, MN, USA). His region was tagged on the 3-D anatomy of the right atrium (RA). Supraventricular tachycardia was induced by programmed atrial stimulation. AT was diagnosed by using the EP maneuvers. The tachycardia was mapped by using the En-site system and the earliest activation was found at the His region. Cryoablation catheter was advanced to the His region. Then, cryoablation could not be performed due to transient AV block during cryomapping of the tachycardia at the point of earliest activation. There was AV block even during manipulation of the cryoablation catheter. Then, 3-D anatomy of the aorta and aortic cusps were constructed (Fig. 1). The earliest local activation was detected within the NCC. Here, local atrial activity preceded onset of the p wave by 53 msec (Fig. 2). Location of the radiofrequency (RF) catheter was confirmed using fluoroscopy and electro mapping system. A single application of RF energy (power: 30 Watts, maximum temperature 55 degree) completely terminated the tachycardia. Total fluoroscopy time was 1 min 38 seconds. The patient was asymptomatic, ECG and rhythm Holter recordings showed no recurrence of AT.

### Discussion

Focal ATs may originate in the right atrium around crista terminalis, coronary sinus, paraHisian region, tricuspid annulus and right atrial appendage. In left atrium, they primarily originate from pulmonary veins, mitral annulus, left atrial appendage and left septum (3). ATs originating