

CATHETER ABLATION OF PREMATURE VENTRICULAR BEATS IN PEDIATRIC POPULATION: A SINGLE CENTER EXPERIENCE

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ORIGINAL ARTICLES

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Etiology is a predictor of recurrence after catheter ablation of ventricular arrhythmias in pediatric patients

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BACKGROUND

- Ventricular arrhythmias (VA) are rare in **pediatric patients**, especially in absence of structural heart disease (SHD).
- Few data are available regarding the invasive VAs treatment with catheter ablation (CA) in pediatric patients and **predictors of outcomes have not been fully investigated**.

AIM

Purpose of the study was to describe the clinical presentation, procedural characteristics and outcomes in pediatric patients undergoing catheter ablation (CA) for VA.

STUDY POPULATION

- Methods:** **experimental prospective study** of patients undergoing catheter ablation for Ventricular Tachycardia (VT) and Premature Ventricular Beats (PVBs). Enrollment period: Jul 2010 - Jan 2019.
- Inclusion criteria:** age < 18 years at diagnosis | ECG documentation of at least 1 VA episode | At least 1 CA of VA in our Hospital.
- Endpoints:** **VA recurrence** after the last CA procedure and **mortality for any cause**.
- Procedural outcomes:** **95 procedures** were performed in **81 patients**, 52 (55%) PVBs and 43 (45%) VT ablations.

Abstract

Background: Ventricular arrhythmias (VAs) are rare in pediatric patients, especially in absence of structural heart disease (SHD). Few data are available regarding the invasive VAs treatment with catheter ablation (CA) in pediatric patients and predictors of outcomes have not been fully investigated.

Objective: To describe the clinical presentation, procedural characteristics, and outcomes in pediatric patients undergoing CA for VAs.

Methods: Eighty-one consecutive pediatric patients (58 male [72%], 15.5 ± 2.2 years) treated by CA for ventricular tachycardia (VT) or premature ventricular beats (PVBs) were retrospectively evaluated. Study endpoints were VAs recurrence and mortality for any cause.

Results: Ninety-five procedures were performed in 81 patients, 52 (55%) PVBs and 43 (45%) VT ablations. During a follow-up of 35.0 months (interquartile range = 13.0–71.0), 14 patients (14.7%) had a VA recurrence: 11 (33.3%) patients treated with CA for VT and 3 (6.2%) patients treated for PVBs ($p < .001$). One patient (1%) died 26 months after the procedure during an electrical storm. Patients with SHD had higher VAs recurrence rate, as compared with idiopathic VAs (pairwise log-rank $p < .001$). Patients treated with CA for VT had higher VA recurrence rate, as compared with PVB patients (pairwise log-rank $p = .002$). At Cox multivariate analysis only SHD was an independent predictor of VAs recurrence (hazard ratio = 5.56, 95% confidence interval = 2.68–11.54, $p < .001$).

Conclusion: CA of VAs is effective and safe in a pediatric population. CA of idiopathic and fascicular VAs are associated with lower recurrence rate, than VAs in the setting of SHD.



FOLLOW-UP

- During a follow-up of 35.0 months (IQR: 13.0-71.0), 14 patients (14.7%) had a VA recurrence: 11 (33.3%) patients treated with CA for VT and 3 (6.2%) patient treated for PVBs (**$p < 0.001$**).
- One patient (1%) died 26 months after the procedure during an electrical storm.

RESULTS

- Patients treated with **CA for VT had higher VA recurrence rate**, as compared with PVB patients (Pairwise Log-Rank $p = 0.002$).
- At Cox multivariate analysis **only structural heart disease (SHD) was an independent predictor** of VAs recurrence (HR = 5.56, CI 95% 2.68 - 11.54, $p < 0.001$).

MAIN FINDINGS OF THE STUDY

- Catheter ablation in pediatric patients is an **effective procedure**, with low recurrence rate (mortality of 1% during FUP).
- Patients treated with CA for VT had higher VA recurrence rate, as compared to PVB patients.
- The **absence of SHD** appeared to be **predictive of higher success rates** in patient undergoing VA catheter ablation.