Transjugal approach for radiofrequency ablation of permanent junctional reciprocating tachycardia in a newborn with bilateral femoral vein thrombosis

İki taraflı femoral ven trombozu olan bir yenidoğanda sürekli kavşak resiprokal taşikardisinin transjuguler yol ile radyofrekans ablasyonu

Mustafa Gülgün, M.D., Tevfik Karagöz, M.D., Hakan Hayrettin Aykan, M.D., İlker Ertuğrul, M.D.

Department of Pediatric Cardiology, Hacettepe University Faculty of Medicine, Ankara

Summary—Although radiofrequency ablation is the first line therapy in some children with supraventricular tachycardia, its application in small children is still limited. Herein, we presented a premature newborn diagnosed as multidrug-resistant permanent junctional reciprocating tachycardia, and treated by radiofrequency ablation via the jugular vein approach because of bilateral femoral vein thrombosis. We think that when there is limited vascular access, the transjugular route for radiofrequency ablation might be considered as an alternative treatment in newborns with multidrug-resistant supraventricular tachycardia.

Abbreviations:
- PJRT: Permanent junctional reciprocating tachycardia
- RFA: Radiofrequency ablation

Herein, we present a premature newborn diagnosed with PJRT and treated using RFA via the jugular vein because of bilateral femoral vein thrombosis due to genetic thrombophilia.

CASE REPORT

An 11-day-old premature girl presented with a diagnosis of supraventricular tachycardia. Her mother had been on sotalol (160 mg daily) and digoxin (0.5 mg daily) treatment because of fetal tachycardia with the rate of 220 beats/minute since the 22nd week of gestation. She was started on amiodarone (10 mg/kg daily) and propranolol (3 mg/kg daily) treatment because the tachycardia was present postnataally. On physical examination, the patient’s heart rate was 200 beats/minute. An electrocardiogram showed narrow QRS tachycardia with long R-P and inverted P wave in DII, DIII, and aVF. Ejection fraction was 67%. Multiple drug
therapy failed to completely control the tachycardia, and impaired ventricular function with 52% ejection fraction occurred within a few days, despite propafenone (10 mg/kg/day) being added to her medication. RFA was planned for when she reached 29 days old. We noticed clogged femoral veins with extensive collateral vessels, bilaterally due to thrombophilic risk factors including mutations in the methylenetetrahydrofolate reductase gene, PAI-1 gene, and Factor V Leiden. We inserted a 5 Fr deflectable 35 mm curve ablation catheter with a 4 mm tip into right atrium via the right jugular vein, and the tachycardia converted to sinus rhythm, with radiofrequency energy (5-10 watt) at a temperature of 50°C at the site recorded at the earliest atrial activation. The tachycardia recurred one week later while she was on drug therapy. When the patient was 56 days old, RFA with a 7 Fr ablation catheter via the left jugular vein was performed again at the posterolateral area next to the coronary sinus ostium with radiofrequency energy (15-20 watt), and sinus rhythm was obtained (Figure 1). The patient has been followed up with no symptoms and medication for 18 months.

**DISCUSSION**

Permanent junctional reciprocating tachycardia is usually resistant to medical treatment. Patients with PJRT are generally diagnosed by chance or present with tachycardia-induced cardiomyopathy because of tachycardia rate within almost normal limits and intermittent clinical course.[1] In small children, antiarrhythmic drugs are the treatment of choice. However, if medical treatment fails to control the tachycardia,
RFA therapy might be considered as an alternative option.[3-5]

Femenía et al.[4] reported a successful RFA in a premature newborn with PJRT. Vaksmann et al.[5] determined 85 patient with PJRT, aged 0-20 years, with an average follow-up of 8.2 years. In this study, 57/85 (67%) patients had been admitted to hospital in the first year of life, 24/85 (%28) patients had heart failure at admission, 19/84 (22%) patients had improved spontaneously, 18/85 (21%) patients had undergone RFA, which was successful in 3 of 6 patients who underwent RFA before the age of 10 years. In our case, ineffectiveness of the first RFA might be attributed to the patient being a newborn, limited vascular access, the choice of a small size ablation catheter, and/or the use of a low level energy.

Akdeniz et al.[6] reported the effectiveness and safety of transcatheter cryoablation and RFA in infants with refractory supraventricular tachycardia. We did not elect to use cryoablation, as transcatheter cryoablation had less catheter steerage ability, affecting its usage in our case.

We think that RFA via the jugular route may be considered as an alternative treatment in newborns and infants with multidrug-resistant PJRT even when they have limited vascular access.

*Supplementary video files associated with this article can be found in the online version of the journal.*

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**REFERENCES**


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**Anahtar sözcükler:** Katater ablasyonu/enstrümentasyon; elektrokardiyografi; yenidoğan.