

**TITLE: EVALUATION OF T-WAVE MEMORY AFTER ACCESSORY PATHWAY ABLATION IN PEDIATRIC PATIENTS WITH WOLF-PARKINSON-WHITE SYNDROME**

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**Running Title: T-wave memory after accessory pathway ablation in pediatric patients**

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## **Abstract**

**Objectives:** The T-wave (cardiac) memory (TWM) phenomenon is a rare cause of T wave inversion. Alterations in the ventricular activation due to abnormal depolarization may cause repolarization abnormalities on the electrocardiogram (ECG), even if myocardial conduction returns to normal. These repolarization changes are defined as TWM. Changes in ventricular depolarization due to manifest accessory pathway (Wolf-Parkinson-White Syndrome-WPW) conduction may present as a repolarization abnormality even after ablation. In adults; these abnormalities may be misinterpreted as ischemia and may lead to unnecessary interventions. In this study, it is aimed to emphasize that the TWM seen after WPW ablation in the pediatric population has a benign course and does not require further investigation.

**Methods:** The data of patients with WPW who underwent electrophysiological studies and ablation between 2015 and 2021 were analyzed retrospectively. The study included 178 patients who were under 18 years of age and had at least one year of follow-up after ablation. Patients with structural heart disease, intermittent WPWs, recurrent ablation, other arrhythmia substrates, and patients with less than one year follow-up were excluded from the study. The ECG data of the patients before the procedure, in the first 24 hours after the procedure, 3 months, 6 months and in the first year were recorded. Standard ablation technique was used in all patients. Statistical analysis was performed by dividing the patients into two groups as those with and without TWM.

**Results:** Of the 481 patients who met the study criteria 178 were included in the study. 112 (62.9%) were male. Mean age was  $11.8 \pm 3.5$  years and mean body weight  $48.4 \pm 19.8$  kg. Post-procedure TWM was observed in 116 (65.2%) patients. The data of the patients are given in *Table 1*. Ninety patients had a right-sided accessory pathway, and 88 patients had a left-sided accessory pathway. In patients with right posteroseptal, right midseptal and right posterior accessory pathways, statistically significant post-procedural TWM was observed. Of these patients, 3 (2.5%) had improved at the first month, 93 (80.1%) at the third month, and 11 (9.4%) at the first-year follow-up. In total, 107 (92.2%) patients showed improvement in TWM at the end of the first year. No adverse events were observed.

**Conclusions:** TWM is seen less frequently in children than in adults and usually returns to normal 3 months after ablation. No further research needed. The most predictive features for the development of TWM include a right-sided pathway location, specifically right posteroseptal, and posterior pathway location.

**Keywords:** Ablation; Cardiac memory; Electrophysiological study; T wave; Wolff-Parkinson-White syndrome

**Table 1.** Distribution of patient data by groups

		No TWM	TWM	p
Age		12.4± 3.5	11.5±3.6	0.112
Gender	Female	20	46	
	Male	42	70	
Weight		50.3±18.8	47.0±20.3	0.294
BSA		1.44±0.33	1.37± 0.36	0.207
Pre-procedural	PR interval*	95 (85-105)	90(75-100)	<b>0.007</b>
	QRS interval*	120 (110-135)	120(111-132)	0.680
	QTc interval	448±26	451±23	0.433
	QRS-T angle*	32(17-54)	80(41-120)	<b>&lt;0.0001</b>
	QRS axis	57±26	15±59	<b>&lt;0.0001</b>
	T axis*	56(41-75)	72(45-97)	0.079
	T peak to end*	80(72-90)	84(74-91)	0.500
Accessory Pathway Location	Right	19	71	<b>&lt;0.0001</b>
	Left	43	45	
Post-procedural	PR interval	126 (115-140)	130(120-146)	0.229
	QRS interval*	82(78-90)	80(74-86)	<b>0.020</b>
	QTc interval	442±21	445±18	0.261
	QRS-T angle*	15(9-29)	47(22-68)	<b>&lt;0.001</b>
	QRS axis	47±23	38±30	0.042
	T axis*	50(36-64)	12(-12-24)	<b>&lt;0.0001</b>
	T peak to end*	90(78-102)	89(78-98)	0.744

\*Given as median (25-75p) for non-normally distributed. The mean±SD for normally distributed.