

**COST EFFECTIVENESS OF PENTARAY HIGH DENSITY MAPPING CATHETER IN TREATMENT OF VENTRICULAR TACHYCARDIA IN TURKEY**

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**OBJECTIVES**

Ventricular tachycardia (VT) is among the main causes of sudden cardiac deaths. There are three methods of VT treatments: implantable cardioverter defibrillator (ICD), antiarrhythmic drugs and catheter ablation. The success rate of catheter ablation is over 90% with lower rates of recurrence rate and side effects. Pentaray is a diagnostic mapping catheter assisting complex mapping catheter in treatment of atrial tachycardia, atrial fibrillation, atrial flutter and idiopathic and ischemic VT. The objective of this study is to assess the cost effectiveness of Pentaray in treatment of VT in Turkey.

**METHODS**

A simple decision making model was used in assessing the cost effectiveness of Pentaray. As there are no studies comparing Pentaray with alternatives, use of Pentaray was compared with non-use. Both the cost of procedures and cost of treatment after relapse were included in the cost of treatment. The ICER was calculated as cost per avoided VT. The analysis was made from the perspective of the Social Security Institution (SSI). Cost data regarding the type and frequency of resources used in treatment of VT were obtained from expert views. Epidemiologic data were obtained from literature and expert views. The SSI reimbursement lists and price lists were used to calculate the cost of treatment. The following data were used in the analysis.

1. Rate of patients with VT was taken as 0,1% (expert view).
2. Rate of VT patients undergoing catheter ablation was taken as 10% (expert view.)
3. Rate of relapse in VT patients with catheter ablation (without Pentaray) was taken from the guideline of the Turkish Cardiology Association as 45% (Türkiye Kardiyoloji Derneği, 2002).
4. Rate of relapse with Pentaray was taken from Berte et al (2015) as 30%.
5. The cost of treatment of VT after relapse (average cost per patient) was taken from expert views. Cost of treatment covered ICD, catheter ablation and antiarythmic drug use.

**FINDINGS**

**Table 1: Number of Patients**

15-65 Age Population	59,854,833
% of Patients with VT	0.1
Number of Patients with VT	59,855
% of VT Patients with Catheter Ablation	10
No of VT Patients with Catheter Ablation	5,986

**Table 2: Summary of Treatment Costs for Relapsed VT After Catheter Ablation**

Treatments Used in Relapsed VT after Catheter Ablation	Total Cost (TRY)
ICD	3,257.30
Antiarrhythmic Drug Treatment	122.74
Catheter Ablation	7,183.22
<b>TOTAL COST</b>	<b>10,563.26</b>

**Table 3: Number of Patients and Cost of Treatments Without Pentaray**

Relapse Rate of VT Patients after Catheter Ablation	45%*
Number of Relapsed VT Patients After Catheter Ablation	2,694**
Cost of Catheter Ablation Without Pentaray (Per Patient) (TRY)	14,908.54
Cost of VT Treatment After Relapse (Per Patient) (TRY)	10,563.26
<b>Total Cost (TRY)</b>	<b>117,699,920.98***</b>

\*Türkiye Kardiyoloji Derneği, (2002)  
 \*\* Number of VT patients with catheter ablation x relapse rate  
 \*\*\* (Number of VT patients with catheter ablation x cost of catheter ablation) + (No of patients with relapse x VT cost after relapse)

**Table 4: Number of Patients and Cost of Treatments With Pentaray**

Relapse Rate of VT Patients after Catheter Ablation	30%*
Number of Relapsed VT Patients After Catheter Ablation	1,796**
Cost of Catheter Ablation with Pentaray (Per Patient) (TRY)	17,758.54
Cost of VT Treatment After Relapse (Per Patient) (TRY)	10,563.26
<b>Total Cost (TRY)</b>	<b>125,274,215.81***</b>

\* Berte et al, 2015  
 \*\* No of VT patients with catheter ablation x relapse rate  
 \*\*\* (No of VT patients with catheter ablation x cost of catheter ablation with Pentaray) + (No of relapsed patients x cost of VT after relapse)

**Table 5: Cost Effectiveness Analysis of Contour Curved Cutter Stapler in LAR in Turkey**

	No of Relapsed VT	Incremental Relapse	Total Cost (TRY)	Incremental Cost (TRY)	ICER (TRY)
With Pentaray	1,796	-898	125,274,215.81	7,554,294.83	8,434.63
Without Pentaray	2,694		117,699,920.98		

**RESULTS**

Percentage of patients with VT in 15-65+ population was taken as 0.1% from expert opinions. The recurrence rates for catheter ablation with and without Pentaray were taken from the literature as 30% and 45% respectively. Number of patients with recurrence was 1,796 and 2,694 respectively for intervention with and without Pentaray. Total cost of treatment of recurrence per patient was 10,563 TRY. Annual total cost for treatment of recurrence was 125,274,215 TRY with Pentaray and 117,699,920 TRY without Pentaray.

**CONCLUSION**

The ICER was estimated as 8,434 TRY. As this figure is well below the recommendations of the WHO threshold, Pentaray is regarded as a cost-effective option in treatment of VT in Turkey.

**References**

Berte, B et al, (2015), 'Impact of Electrode Type on Mapping of Scar-Related VT' J Cardiovasc Electrophysiol, Vol. 26, pp. 1213-1223  
 Türkiye Kardiyoloji Derneği, (2002), Pacemaker Ve Kardiyoverter Defibrilatör (ICD) İmplantasyonu Endikasyonları Kılavuzu, Ankara.

*This study was sponsored by Johnson & Johnson Turkey*