

# A Novel Scoring System for Preoperative Prediction for Pain-Free Survival After Microsurgery for Trigeminal Neuralgia: TN-MVD Score

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## Learning Objectives

By the conclusion of this session, participants should be able to:

- (1) Have a greater understanding of the factors that effect outcome following surgical intervention for Trigeminal Neuralgia, (2) Be able to implement this simple scoring system when considering likelihood of pain-free outcomes in heterogeneous patient populations, (3) identify factors which predict a greater likelihood of successful operative intervention in Trigeminal neuralgia

## Introduction

Pain relief following microsurgery for trigeminal neuralgia (TN) may be related to multiple factors including pain type(1), degree of neurovascular conflict(2), arterial compression, and location of compression(3). The objective of this study was to construct a predictive scoring system based on clinical and radiographic factors that can preoperatively prognosticate long-term outcomes in TN following surgery.

## Methods

275 patients with Type 1 or Type 2 TN underwent microvascular decompression(MVD) or internal neurolysis(IN) following a preoperative high-resolution MRI. Outcome data was obtained retrospectively by chart review and/or phone follow-up. Characteristics of neurovascular conflict were obtained from preoperative MRI. Factors that resulted in a probability value of <0.05 on univariate logistic regression analyses were entered into a multivariate cox regression analysis in a backward stepwise fashion. For the multivariate analysis, significance at the 0.15 level was used.(4) A prognostic system was then devised (see Table 1) with four possible composite scores (0, 1, 2, or 3) and survival analyses were conducted. Composite scores were additive, except in TN2 patients who recieved a score of zero regardless of degree of neurovascular compression.

Composite Score Components	Points	Multivariate Cox Regression		Composite Score Construct	
		Univariate	Cox Regression		
<b>Pain type Score</b>	TN2 (n=37) TN1 (n=238)	0 1	p=0.013 p=0.034	p=0.005	
<b>Vessel Score</b>	No Vessel near nerve (n=48)	0	p=0.042 p=0.105		
	Vein(n=38)	1			
	Artery(n=189)	1			
<b>Compression Severity Score</b>	No vessel near nerve (n=49)	0	p=0.038 p=0.122		
	Grade I (touching) (n=98)	0			
	Grade II (compression)(n=65)	1			
	Grade III (distortion) (n=63)	1			
<b>Total Score =</b>					

## Composite Score Components

### Figure 1. Pain-Free Survival

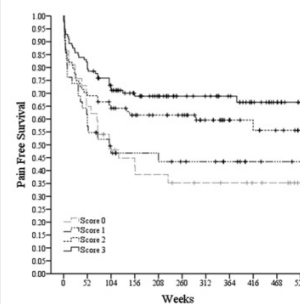


Fig. 1. Kaplan-Meier Curve plotting pain-free survival by composite score (Log rank p=0.05)

## Results

Univariate predictors of pain-free survival were pain type(p=0.013), presence of any vessel(p=0.042), and neurovascular compression severity(p=0.038). Scores of 0, 1, 2, and 3 were found to be significantly different in regard to pain-free survival(log rank, p=0.005) (Figure 1). At 5 and 10 years, pain-free survival was 36, 43, 61 and 69% and 36, 43, 56, and 66% in groups 0, 1, 2, and 3, respectively. TN1 patients with severe neurovascular conflict (score of 3) had the best outcome, which was significantly better than TN1 patients without neurovascular conflict(score of 1)(log rank, p=0.005) while the worst outcomes occurred in patients with TN2. Severe neurovascular conflict is more likely to have arterial compression (99%) (p<0.001).

## Conclusions

Pain-free survival of TN patients after microsurgery can be predicted in a step-wise statistically significant fashion, by a simple scoring system based on preoperative clinical and radiographic findings.

## References

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