

# A novel perspective on trigeminal neuralgia progression

- Patients with trigeminal neuralgia (TN) typically experience shock-like episodes of pain.<sup>1,2</sup>
- With time, the character of their pain may modify in frequency and quality, with eventual development of burning or dull overtones.<sup>3,4,5</sup>
- Previously several subtypes of TN have been described (TN type 1, TN type 2).<sup>1,2</sup>

**Hypothesis:** TN is a syndrome with a spectrum of grades, each with different brain imaging correlates, pain characteristics and surgical outcomes.

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3. W. J. Elias, K. J. Burchiel, *Curr. Pain Headache Reports*, 62. 6, 115-124 (2002).
4. K. J. Burchiel, K. V. Slavin, *Neurosurgery*. 46, 152-155 (2000).
5. M. Moayed, M. Hodaie, *Pain reports*. 4 (2019).

**Objective:** We propose a novel machine learning (ML)-driven grading system for TN based on brain imaging and clinical data. We then use this system to estimate the likelihood of long-term pain relief.



# Design of study

## Demographics and analysis pipeline

Dataset demographics	Initial diagnosis of Classical TN
Sample size (n)	104
Age (years)	60.3 ± 14.4
Sex (males : females)	44 : 60
Pain side (L : R)	38 : 66
Surgery (GK : MVD)	71 : 33

Patients were followed up for 5 years after the surgery or until pain recurrence

**TN**: trigeminal neuralgia, **PCA**: principal component analysis, **PC**: principal component, **DWI**: diffusion-weighted imaging, **DTI**: diffusion tensor imaging, **JHU**: Johns Hopkins University, **ML**: machine learning

