Long-Term Pain Outcomes in Patients with Trigeminal Neuralgia and Depression Following Microvascular Decompression

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Abstract

We retrospectively analyzed 163 patients (175 MVDs) for trigeminal neuralgia to evaluate whether pre-existing depression predicted long-term pain outcomes. Depression was present in 18% of patients. Residual long-term pain was similar with vs without depression (24% vs 22%), and depression was not associated with long-term pain relief (HR 1.04, p=0.93). In subgroup analysis of depressed patients, symptom duration ≥5 years predicted higher recurrence risk (HR 9.52, p=0.014) and shorter median pain relief (32.9 vs 67.2 months, p=0.0048).

Introduction

Depression is a psychiatric comorbidity often experienced by patients with trigeminal neuralgia. Beyond its psychological burden, depression has been shown to alter pain perception and impair coping mechanisms. Despite this, its impact on long-term outcomes for trigeminal neuralgia following microvascular decompression (MVD) have not been well characterized. The aim of this study was to compare long-term pain outcomes in patients with and without pre-existing depression after MVD as well as identify predictors of pain relief within each group.

Methods and Materials

A retrospective analysis of patients with trigeminal neuralgia and pre-existing depression who underwent microvascular decompression from 2008–2025 at a single institution was conducted. Demographics at presentation and operative data were collected. The primary outcome was long-term pain relief, defined as absence of pain at last-follow-up. Chi-square/Fisher's exact test assessed association between categorical variables and pain outcomes. Univariate Cox proportional hazards regression analysis and Kaplan-Meier survival analysis assessed prognostic factors for long-term pain relief.

Results

In total, 163 patients underwent 175 microvascular decompression (MVD) procedures for trigeminal neuralgia. Pre-existing depression was present in 29 patients (18%), predominantly women (24/29, 83%), compared with 77/134 (57%) in the non-depressed group (p= 0.0114). Most patients presented with purely paroxysmal pain (138/163, 85%). Residual long-term pain was similar between groups (depression: 7/29, 24% vs no depression: 36/134, 22%). On univariate analysis, depression was not associated with long-term pain relief (HR 1.04, 95% CI 0.48–2.25; p=0.93). However, within the depression subgroup, symptom duration ≥5 years was strongly associated with higher risk of long-term pain recurrence (HR 9.52, 95% CI 1.57–57.9; p=0.014). Kaplan–Meier analysis showed shorter median duration of long-term pain relief among depressed patients with symptoms ≥5 years (32.9 months) versus <5 years (67.2 months; p=0.0048).

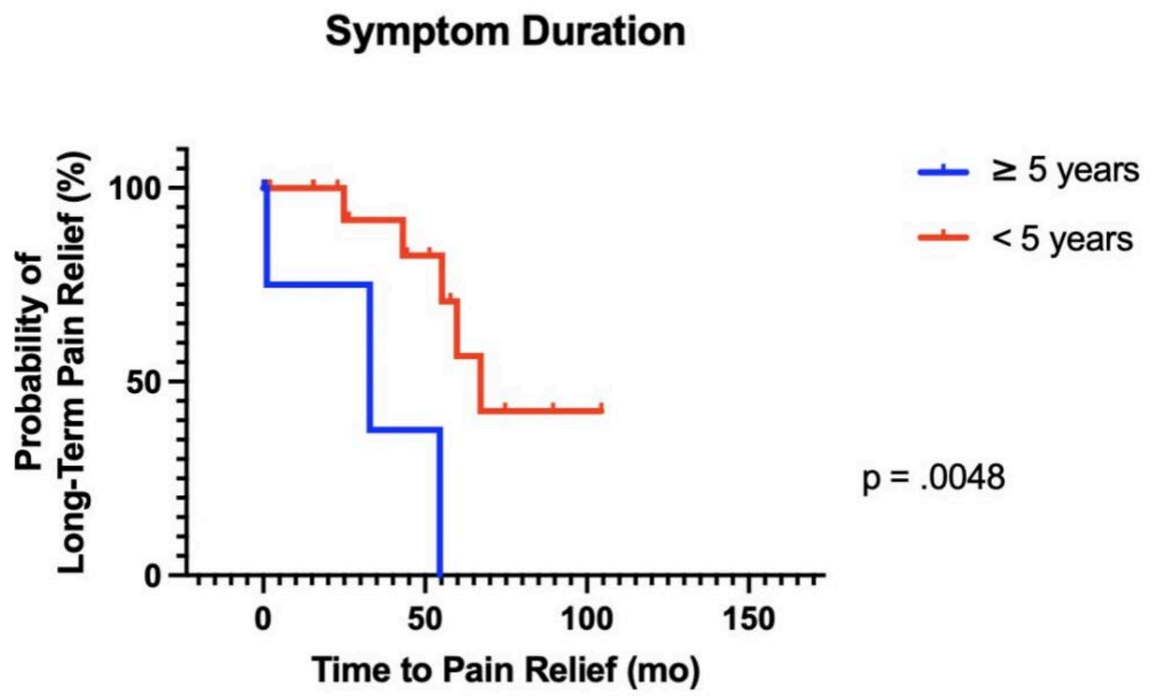

Figure 1. Kaplan-Meier analysis of long-term pain relief of TGN patients following microvascular decompression in patients with depression, based on baseline symptom duration. Patients with a symptom duration of ≥ 5 years (blue) experienced significantly shorter pain-free survival compared with those with <5 years of symptoms (red).

Discussion

Pre-existing depression was not associated with long-term pain relief following MVD for trigeminal neuralgia, suggesting that depression alone should not be considered a negative prognostic factor for surgical benefit. However, among patients with depression, symptom duration ≥5 years was associated with substantially higher risk of long-term pain recurrence and shorter durability of pain relief, highlighting a potential high-risk subgroup. This pattern may reflect the effects of prolonged disease burden (e.g., central sensitization or chronic pain-related neurobiological changes) and/or care factors such as delayed referral and treatment. Clinically, these findings support timely surgical evaluation and emphasize the importance of counseling depressed patients, particularly those with long-standing symptoms, regarding recurrence risk and expectations after MVD. Given the retrospective design, limited subgroup sample size, and potential unmeasured confounding, prospective studies are needed to confirm this interaction and evaluate whether early intervention or perioperative mental health optimization improves outcomes.

Conclusions

Depression at presentation was not an independent predictor of long-term recurrence. However, for patients with depression, longer baseline symptom duration (≥5 years) was significantly associated with higher risk of long-term pain recurrence.

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