



THERAPEUTIC EFFICACY OF MICROVASCULAR DECOMPRESSION FOR TRIGEMINAL NEURALGIA: NASCENT EXPERIENCE

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ABSTRACT

Objective: Trigeminal neuralgia (TN) is a chronic facial pain disorder most caused by neurovascular compression of the trigeminal nerve. Microvascular decompression (MVD) directly addresses this underlying pathology. This study evaluates the therapeutic outcomes of MVD. **Methods:** A retrospective observational study of patients undergoing MVD between March 2017 and June 2025 was conducted. Pain severity was assessed using the Barrow Neurological Institute (BNI) pain score. A postoperative BNI score ≤ 3 was considered satisfactory. **Results:** Thirty-two patients (14 males [43.8%], 18 females [56.2%]; mean age 52.5 years) were included. Neurovascular conflict was identified in all patients. Three patients (9.4%) had cerebellopontine angle tumors (1 acoustic schwannoma, 2 epidermoid tumors). At a mean follow-up of 16.67 months, all patients achieved postoperative BNI score 1. **Conclusions:** Microvascular decompression provides excellent and durable pain relief in appropriately selected patients.

KEYWORDS :

INTRODUCTION

Trigeminal neuralgia is a chronic facial pain disorder characterized by brief episodes of severe, electric shock-like pain triggered by routine activities. Neurovascular compression at the root entry zone is the most accepted etiological mechanism [1]. Despite optimal medical therapy, a subset of patients remain refractory or intolerant to medications, necessitating surgical intervention [2]. Microvascular decompression directly addresses the underlying pathology while preserving trigeminal nerve function and offers durable pain relief [3,4].

MATERIALS AND METHODS

This retrospective observational study was approved by the institutional ethics committee. Patients undergoing microvascular decompression between March 2017 and June 2025 were included. All patients underwent MRI to identify neurovascular conflict and exclude secondary causes. Pain severity was assessed using the validated Barrow Neurological Institute pain score [5]. Descriptive statistical analysis was performed.

RESULTS

Thirty-two patients underwent microvascular decompression. The cohort included 14 males (43.8%) and 18 females (56.2%), with a mean age of 52.5 years. Neurovascular conflict was present in all patients. Three patients (9.4%) had secondary trigeminal neuralgia due to cerebellopontine angle tumors, including one acoustic schwannoma (3.1%) and two epidermoid tumors (6.3%). At a mean follow-up of 16.67 months, all patients achieved a postoperative BNI score of 1.

Table 1. Demographic And Clinical Profile (N = 32)

Variable	Value
Male	14 (43.8%)
Female	18 (56.2%)
Mean age	52.5 years
Neurovascular conflict on MRI	32 (100%)
CPA tumors	3 (9.4%)
Acoustic schwannoma	1 (3.1%)
Epidermoid tumor	2 (6.3%)

Table 2. Preoperative BNI Pain Scores

BNI Score	Patients	Percentage
5	28	87.5%
4	4	12.5%

Table 3. Postoperative BNI Pain Scores

BNI Score	Patients	Outcome
1	32	Excellent

Figures

Pre-operative BNI Pain Score Distribution (N=32)

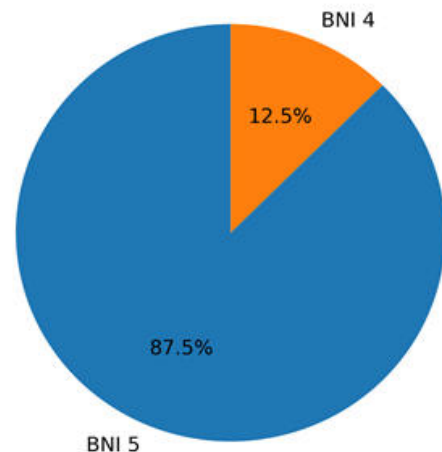


Figure 1. Preoperative BNI pain score distribution.

Post-operative BNI Pain Outcome (N=32)

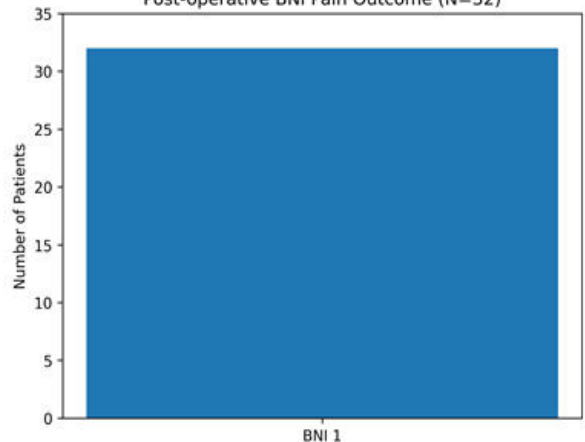


Figure 2. Postoperative BNI pain outcome following microvascular decompression.

DISCUSSION

The present study demonstrates that microvascular decompression provides excellent postoperative pain relief in patients with trigeminal neuralgia refractory to medical therapy. The uniform achievement of a postoperative Barrow Neurological Institute pain score of 1 in all

patients reflects appropriate patient selection and meticulous surgical technique.

The consistent identification of neurovascular conflict on preoperative MRI underscores the importance of radiological evaluation in predicting favorable outcomes. Contemporary literature has repeatedly demonstrated superior pain control following microvascular decompression in patients with clearly defined neurovascular compression, supporting imaging-based selection criteria [1,3,4].

Delayed referral for surgical intervention remains a notable concern, as reflected by the prolonged interval between diagnosis and surgery observed in this cohort. Earlier consideration of surgical management in medically refractory patients may reduce disease burden and improve overall quality of life.

Secondary trigeminal neuralgia due to cerebellopontine angle tumors was identified in a small subset of patients, including acoustic schwannoma and epidermoid tumors. This finding highlights the necessity of routine preoperative imaging to identify secondary causes, which may influence both surgical strategy and prognosis.

Compared with ablative procedures and stereotactic radiosurgery, microvascular decompression offers durable pain relief without intentional trigeminal nerve injury. Although less invasive options may be appropriate in select patients with advanced age or significant comorbidities, microvascular decompression remains the definitive surgical treatment for trigeminal neuralgia in appropriately selected patients when performed in experienced centers [2,4].

CONCLUSION

Microvascular decompression is a highly effective surgical treatment for trigeminal neuralgia, providing excellent pain relief with preservation of trigeminal nerve function.

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