Case Report

# Glossopharyngeal Neuralgia Treated with Microvascular Decompression

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***Abstract***

*Glossopharyngeal neuralgia (GPN) poses a unique challenge in that its clinical symptoms, especially pain in the facial area, can be misinterpreted as other cranial nerve and dental disorders. Microvascular decompression (MVD) is typically the definitive treatment. We encountered a case in which MVD was successfully performed to relieve pain in a patient with left-sided GPN in a 38-year-old male who presented with severe episodic pain in the tongue, cheek, and jaw. The patient had undergone dental surgery and pharmacological therapy only to experience temporary relief from gradually worsening clinical symptoms. Fiberoptic endoscopic evaluation of swallowing and brain magnetic resonance imaging with constructive interference in steady-state sequences were used to support the diagnosis of GPN. MVD was then performed to surgically relieve the vascular compression of the left glossopharyngeal nerve, resulting in significant clinical improvement. MVD could be an option to decrease pain and other symptoms in patients with GPN that could not be treated with pharmacological therapy.*
***Keywords:*** *glossopharyngeal neuralgia, cranial nerve compression, neurovascular, microvascular decompression.*

# Pembedahan *Microvascular Decompression* pada Neuralgia Glossopharyngeal

***Abstrak***

*Neuralgia glossopharyngeal (NGP) merupakan tantangan klinis yang unik karena gejalanya, terutama nyeri pada wajah, dapat salah didiagnosa sebagai gangguan saraf kranial dan penyakit gigi. Microvascular decompression (MVD) merupakan terapi definitif yang terpilih. Kami menangani kasus yang menunjukkan keberhasilan terapi MVD dalam menghilangkan nyeri di NGP sisi kiri pada pasien laki-laki berusia 38 tahun dengan nyeri episodik pada lidah, pipi, dan rahang. Pasien sebelumnya telah menjalani tindakan bedah gigi dan terapi farmakologis, namun hanya memberikan perbaikan sementara dan gejala klinisnya memburuk secara bertahap. Fiberoptic endoscopic evaluation of swallowing dan magnetic resonance imaging otak dengan sekuens constructive interference in steady state menunjukkan diagnosis NGP. MVD kemudian dilakukan untuk menghilangkan kompresi vaskular pada saraf glossopharyngeal kiri melalui pembedahan, yang menghasilkan perbaikan klinis yang signifikan. MVD dapat menjadi pilihan terapi untuk mengurangi nyeri dan gejala lain pada pasien GPN yang tidak merespons terapi farmakologis.*
***Kata kunci:*** *neuralgia glossopharyngeal, kompresi saraf kranial, neurovaskular, microvascular decompression.*

## Introduction

Glossopharyngeal neuralgia (GPN) is a rare condition that is painful and disruptive to daily life. It causes sudden, sharp, and stabbing pain in areas such as the throat, back of the tongue, tonsils, and ear. These painful episodes are often triggered by simple actions such as swallowing, talking, or coughing, turning routine tasks into distressing experiences.[1,2] While GPN is uncommon, its impact can be profound, leaving patients struggling to manage pain. This condition is usually linked to irritation or compression of the glossopharyngeal nerve, which may be caused by blood vessels pressing on the nerves, tumors, or other unknown factors.[1,2] Modern imaging techniques, such as high-resolution magnetic resonance imaging (MRI), have made it easier to identify these underlying issues and improve the accuracy of diagnosis. Treatment options vary from medications such as carbamazepine or gabapentin to surgical procedures such as microvascular decompression in more severe cases. However, the GPN remains challenging to understand fully, and its rarity can lead to delays in diagnosis or confusion with other conditions, such as trigeminal neuralgia.[1,2] This case report presents a unique phenomenon of GPN that was treated with microvascular decompression surgery, aiming to improve awareness and understanding of this rare condition. By sharing this experience, we emphasize the importance of early diagnosis and personalized treatment to ensure better outcomes for patients with this challenging disorder.

## Case Description

A 38-year-old male presented with severe episodic pain localized to the left side of his tongue base, inner cheek, and jaw. The pain was first noticed approximately one year prior to presentation and was initially triggered by swallowing, chewing, and moving the tongue. The episodes were described as sharp and stabbing, with pain intensity rated at 6–7 on the numerical rating scale (NRS), occurring once daily. Initially suspected to be dental in origin, the patient underwent dental cleaning and tooth extraction, which provided temporary relief and reduced the pain to an NRS score of 1. However, the patient did not pursue follow-up care. Several months later, the pain re-emerged with similar triggers and frequency but increased in severity. Within weeks, the episodes intensified, occurring up to 20 times daily with an NRS of 7–8, significantly impacting his quality of life. Despite carbamazepine being prescribed by a neurologist, the relief was partial and short-lived. The pain subsided briefly with sensory desensitization therapy but recurred, leading to a 10 kg weight loss over two months.

Clinical evaluation revealed no neurological deficits, except for tenderness in the left tonsillar fossa and jaw during swallowing and tongue movements, with restricted tongue mobility secondary to pain. Fiberoptic endoscopic evaluation of swallowing (FEES) showed normal oropharyngeal swallowing mechanics, confirming odynophagia due to left-sided GPN. MRI with constructive interference in steady-state (CISS) sequences detected vascular compression of the left glossopharyngeal nerve from the AICA branch in the root entry zone (REZ) (Figure 1).

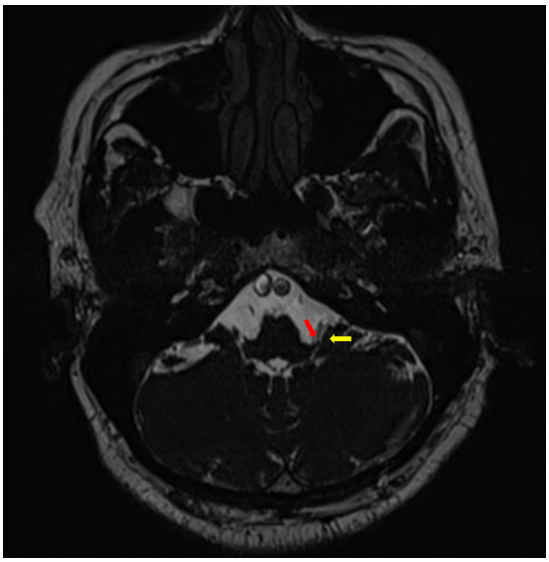

**Figure 1. CISS Sequences of Brain MRI. Left N. IX (Yellow Arrow); AICA Branch (Red Arrow)**

The patient underwent microvascular decompression (MVD) as a definitive treatment. Under general anesthesia, retrosigmoid craniotomy exposed the glossopharyngeal nerve complex (Figure 2a). Intra-operative findings confirmed neurovascular compression by the vascular loop of the posterior inferior cerebellar artery (PICA) branch at the nerve root entry zone (Figure 2b). The offending vessel (PICA branch) was carefully dissected from the nerve to prevent recompression. Teflon was also inserted between the N. IX-X complex and the left vertebral artery (Figure 2c). Intraoperative neurophysiology monitoring showed resolution of the abnormal neural activity of N IX without irritating other cranial nerves (n. V, VII, VIII, X, XI, and XII), confirming the decompression success after Teflon insertion (Figure 3).

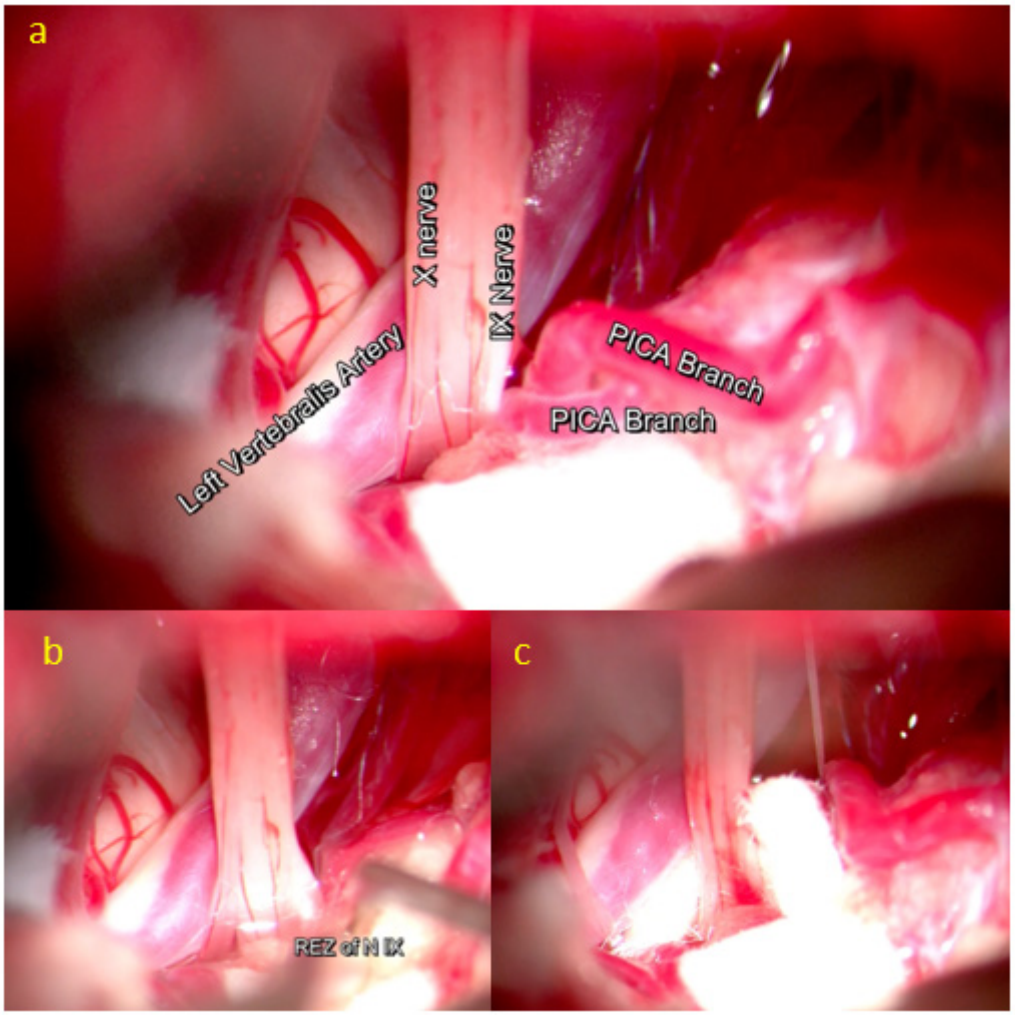


**Figure 2. Intra-operative Findings**
a. N. IX and X Complex with the Surrounding Tissue; b. REZ of N. IX is Shown After the PICA Branch was Removed; c. Teflon was Placed Around the N. IX-X Complex.

Three weeks after surgery, the patient experienced no pain in the tongue base, inner cheek, and jaw, which improved his quality of life and marked a successful resolution of this debilitating condition. Postoperative neurological deficits were not observed.

## Discussion

GPN is a rare but profoundly painful condition that affects the throat, tongue, and ear, causing sharp paroxysmal pain episodes triggered by simple actions such as swallowing, chewing, or coughing. Although less common than trigeminal neuralgia, GPN often presents with greater intensity and can lead to serious complications, such as bradycardia or syncope. Neurovascular compression at the REZ of the glossopharyngeal nerve, often caused by the PICA, is the most common underlying cause. Diagnosing GPN can be challenging due to symptom overlap with other facial pain syndromes, while it can be symptomatically different from the criteria of The International Classification of Headache Disorders (Table 1). Advances in imaging, particularly high-resolution MRI with CISS sequences, have improved diagnostic accuracy by revealing vascular compression.

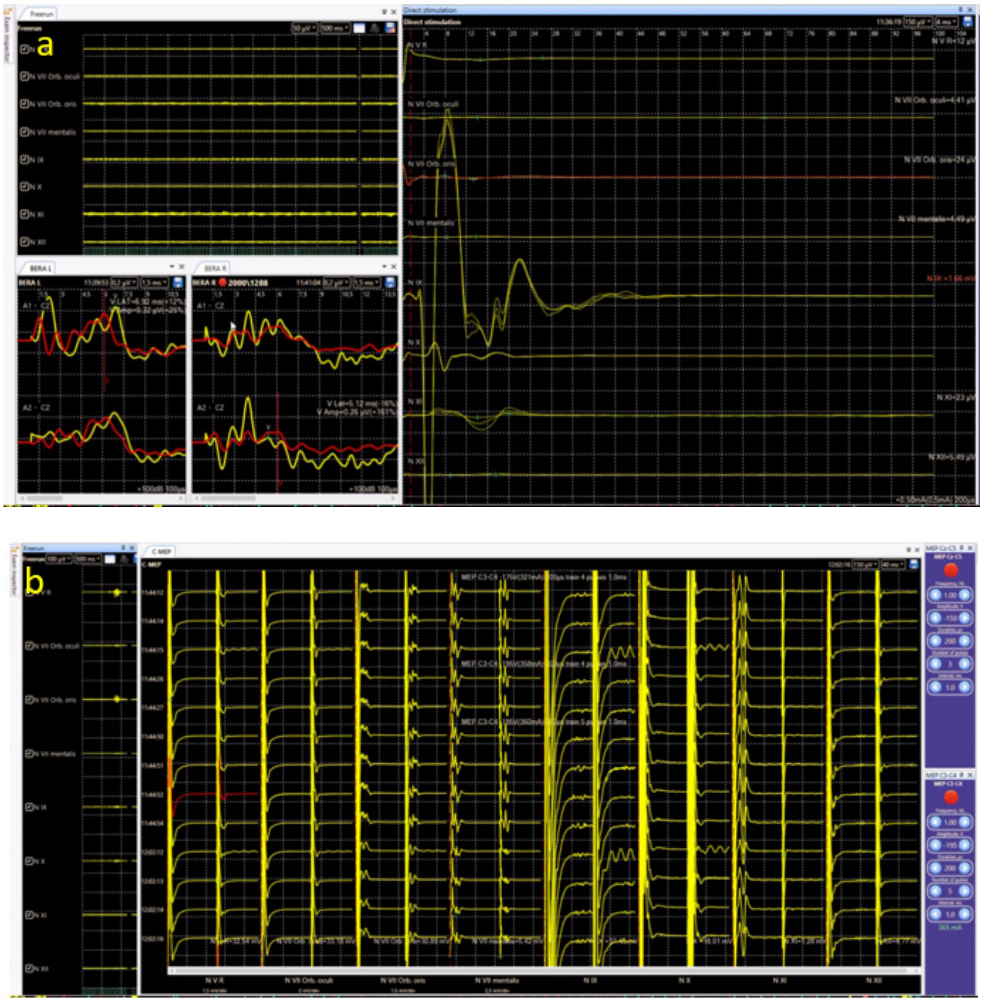


**Figure 3. Intraoperative Neurophysiology Monitoring (N V, VII, VIII, IX, X, XI, XII)**
a. Free-run Electromyography (EMG) Showed No Myotonic Discharge during Surgery (Left Upper Box), and Brainstem Auditory Evoked Potential (BAEP) Showed No Change of Latency of I, III, And V Wave Before, During, and After Surgery (Left Lower Box), The Glossopharyngeal Nerve Was Identified by Direct Nerve Stimulation (Right Box); b. Motor evoked potential (MEP) Showed No Change in MEP Response During the Surgery.

**Table 1. Diagnostic Criteria of Glossopharyngeal Neuralgia**

| | |
|---|---|
| A. | At least three attacks of unilateral pain fulfilling criteria B and C occurred. |
| B. | Pain is located in the posterior part of the tongue, tonsillar fossa, pharynx, or beneath the lower jaw angle and/or in the ear. |
| C. | Pain has at least three of the following four characteristics:<br>- Recurring paroxysmal attacks lasting from a few seconds to 2 min.<br>- Severe intensity<br>- Shooting, stabbing, or sharp in quality<br>- Precipitated by swallowing, coughing, talking, or yawning. |
| D. | No clinically evident neurological deficits. |
| E. | Not accounted for better by another The International Classification of Headache Disorders – 3 (ICHD-3) diagnosis. |

MVD is the gold standard treatment for GPN when medication fails. Kim et al[1] analyzed the outcomes of MVD in 30 patients with primary GPN over a follow-up period of at least two years. Their findings showed that 96.7% of patients experienced significant pain relief, becoming either pain-free or requiring no medication for occasional mild pain. The most common offending vessel was the PICA, alone or in combination with others. The study utilized different surgical techniques, including transposition and interposition with Teflon materials, and found that outcomes were not significantly affected by the choice of method, highlighting the importance of tailoring the approach to each patient's anatomy.[2]

Our patient's case closely reflected these findings. After enduring severe pain for over a year and failing medical therapy, including dental surgery, the patient underwent MVD. Preoperative MRI confirmed vascular compression at the REZ of the glossopharyngeal nerve. The offending vessel was carefully separated from the nerve during surgery, and Teflon was placed to prevent recompression. Postoperatively, the patient experienced immediate and sustained pain relief without complications, aligning with the high success rate reported in this study.

This study also underscores the diagnostic challenges of GPN. Many patients, including this patient, were frequently misdiagnosed as having dental problems, trigeminal neuralgia, or other disorders initially. Differentiating GPN from others requires a thorough clinical history to identify pain triggers and localization, supported by imaging to confirm neurovascular compression.

Surgical precision in MVD is of utmost importance. In some cases, rhizotomy may also be performed, especially in cases in which there is no obvious nerve compression. It is hoped that it may improve the chances of long-term pain control, but this maneuver also increases the risk of permanent dysphagia and vocal cord paralysis.[3,4] In this case, rhizotomy was not performed, and in addition to the high risk, nerve compression was visible; therefore, it was deemed unnecessary to perform rhizotomy.
In some cases, endoscopic MVD can be performedsafely and effectively, although microscopic is still commonly used.[2] Transposition techniques minimize the use of foreign materials but require careful handling to avoid damaging small vessels. Interposition techniques, while simpler, carry a higher risk of recurrence due to adhesions. These considerations emphasize the need for individualized surgical planning to optimize outcomes. In this case, a combination of interposition and transposition was performed. Intra-operative monitoring also plays a pivotal role in supporting the operation's success and reducing the risk of injury to other cranial nerves.

## Conclusion

This case demonstrates the effectiveness of MVD in addressing neurovascular compression, providing durable relief for GPN, and validating MVD as a safe and reliable treatment with a high success rate and minimal complications, making it the preferred approach for managing this challenging condition.

## Conflict of Interest

There are no conflicts of interest.

## Acknowledgment

None

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