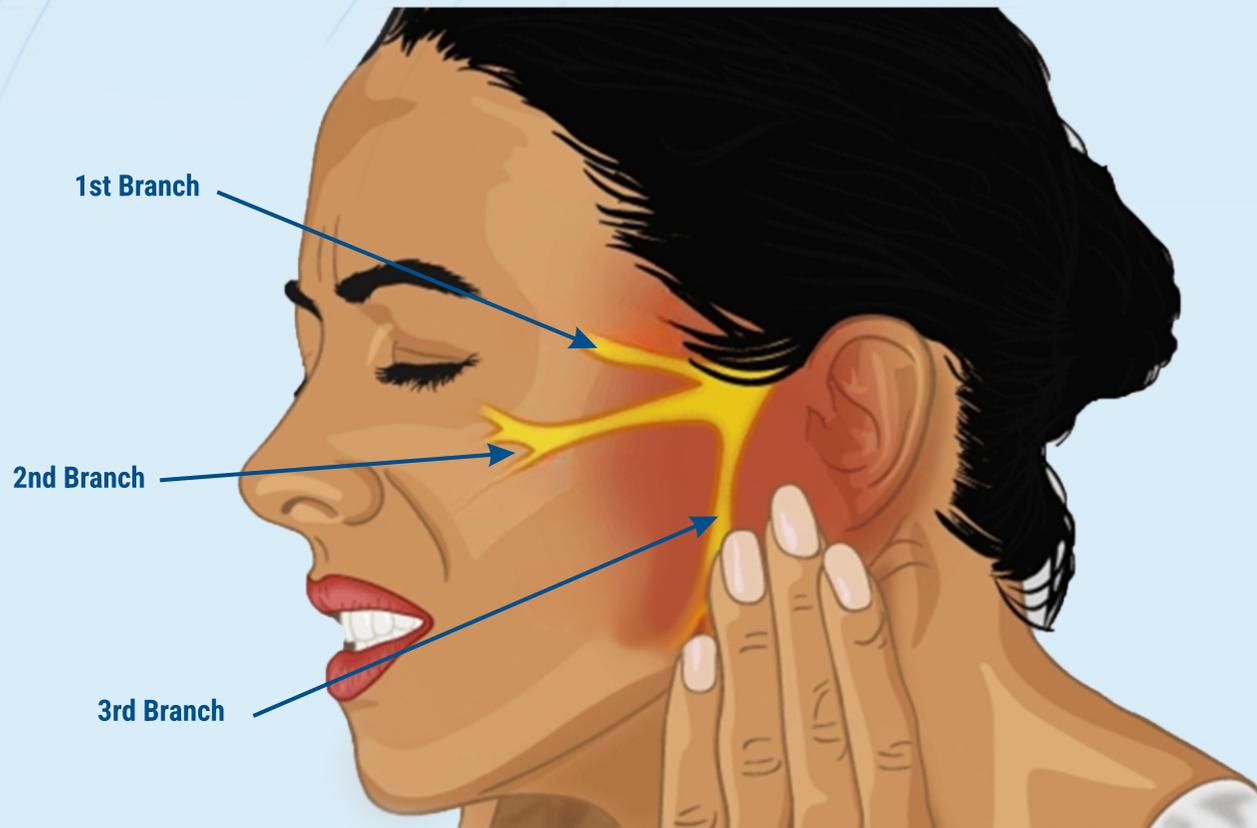


Neuron

Newsletter from Neuro One Hospital

Issue -05 ■ October-2025



Trigeminal Neuralgia: From Agony to Relief

Microvascular Decompression

A Keyhole Neurosurgical Breakthrough

Neuron - A Newsletter from



Neuro One Hospital

Leaders in neuro care

When Pain Becomes Life -Altering – And Relief Becomes Possible

Trigeminal neuralgia is not just another type of facial pain – it is often described as one of the most agonizing conditions known. Patients live in constant fear of the next pain episode, triggered by simple acts like brushing, chewing, or even wind on the face.

While medications work initially, many find their effects wear off or the side effects become intolerable. For those who continue to suffer, **Microvascular Decompression (MVD) offers a safe, precise and curative option.**

At Neuroone Hospital, we have performed **112 MVDs over the past 8 years**, transforming the lives of patients. This newsletter shares that journey – from understanding the condition to achieving lasting relief.

Regards,

Dr **S.Vijay Kumar** MCh.,

Keyhole Brain and Spine Surgeon

Founder and Managing Director

Neuroone Hospital

What is Trigeminal Neuralgia?

Trigeminal neuralgia (TN) is a chronic pain condition involving the trigeminal nerve, which supplies sensation to the face. The pain is:

- Sudden, shock-like, and stabbing
- Usually on one side of the face
- Triggered by light touch, brushing, eating, talking, or shaving
- Typically affects the V2 (maxillary) or V3 (mandibular) branches

Patients often identify trigger zones—small areas on the face or inside the mouth where a light touch can provoke intense pain. These triggers play a key role in both diagnosis and the disabling nature of the disease.

Pathogenesis: The Root Cause

In most cases, TN is caused by vascular compression at the root entry zone of the trigeminal nerve, usually by the superior cerebellar artery. This causes focal demyelination, leading to abnormal nerve firing.

Some cases are secondary TN, caused by tumors (meningiomas, schwannomas, epidermoids), infiltrative diseases (carcinomatosis, amyloidomas), or brainstem vascular lesions – though often with an associated vascular loop.

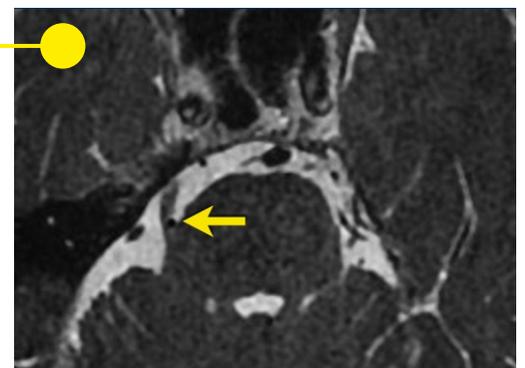
Differential Diagnosis: What It Isn't

Because of its distinct presentation, TN must be differentiated from other facial pain disorders:

Condition	Key Features
Pre-TN	Dull, aching prodrome; evolves into classic TN
Postherpetic Neuralgia	Constant burning pain in V1 after shingles
Glossopharyngeal Neuralgia	Pain in throat/ear during swallowing
Tic Convulsif	TN with hemifacial spasms
Geniculate Neuralgia	Stabbing pain deep in the ear
Dental Pain	Sharp, stimulus-provoked, localized to teeth
TMJ Disorders	Dull ache in jaw; worsens with movement
Maxillary Sinusitis	Throbbing cheek pain, worse in mornings / head-down
Migraine	Throbbing head pain with aura/nausea
Giant Cell Arteritis	Temporal pain, systemic symptoms, vessel tenderness

Neurovascular compression at the root entry zone

High-resolution MRI is used to rule out secondary causes and confirm vascular compression.

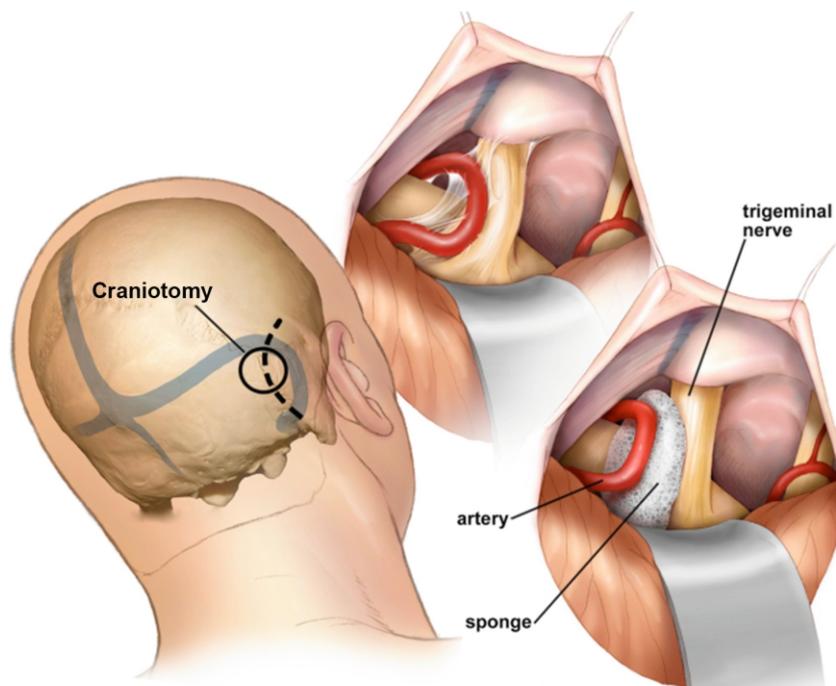


When Medications Fail

Medical therapy with carbamazepine or oxcarbazepine is the first line of treatment. However, side effects like sedation, imbalance, or liver toxicity limit long-term use. When medications no longer provide relief, surgical intervention is warranted.

Microvascular Decompression: A Keyhole Cure

Our Six-Step Surgical Technique in MVD



At Neuroone Hospital, we follow a meticulous, microsurgical keyhole approach to Microvascular Decompression (MVD), designed to minimize trauma and maximize outcomes. The entire technique is rooted in the principles of precision, minimal invasiveness, and anatomical preservation.

Step 1: Patient Positioning – The Foundation of Success

“Vertex position dictates cranial nerve exposure.”

Optimal surgical exposure begins long before the incision. After anesthesia and intubation, the patient is placed supine with a three-point head fixation. The head is:



Patient Positioning

“Supine position with head fixation, 10° rotation away from the affected side and 20° vertex tilt – enabling gravity-assisted cerebellar fall and optimal access to the trigeminal nerve.”

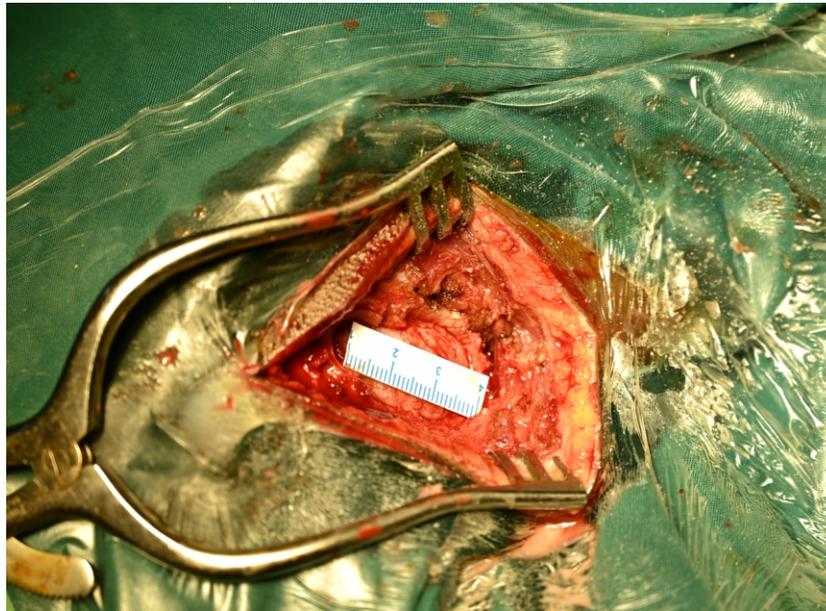
- Rotated 10° away from the affected side
- Vertex tilted 20° towards the floor
- Neck flexed so the chin is two finger breadths from the sternum

Shoulders are taped down and the body secured to allow table rotation. This setup allows a gravity-assisted cerebellar fall, providing atraumatic access to the cerebellopontine angle.

Step 2: Surgical Incision – Guided by Landmarks

"Incision varies based on patient anatomy, but precision minimizes tissue disruption."

A 3 × 3 cm area behind the ear is shaved and anatomical landmarks are identified:



Craniotomy with 3 cm Scale

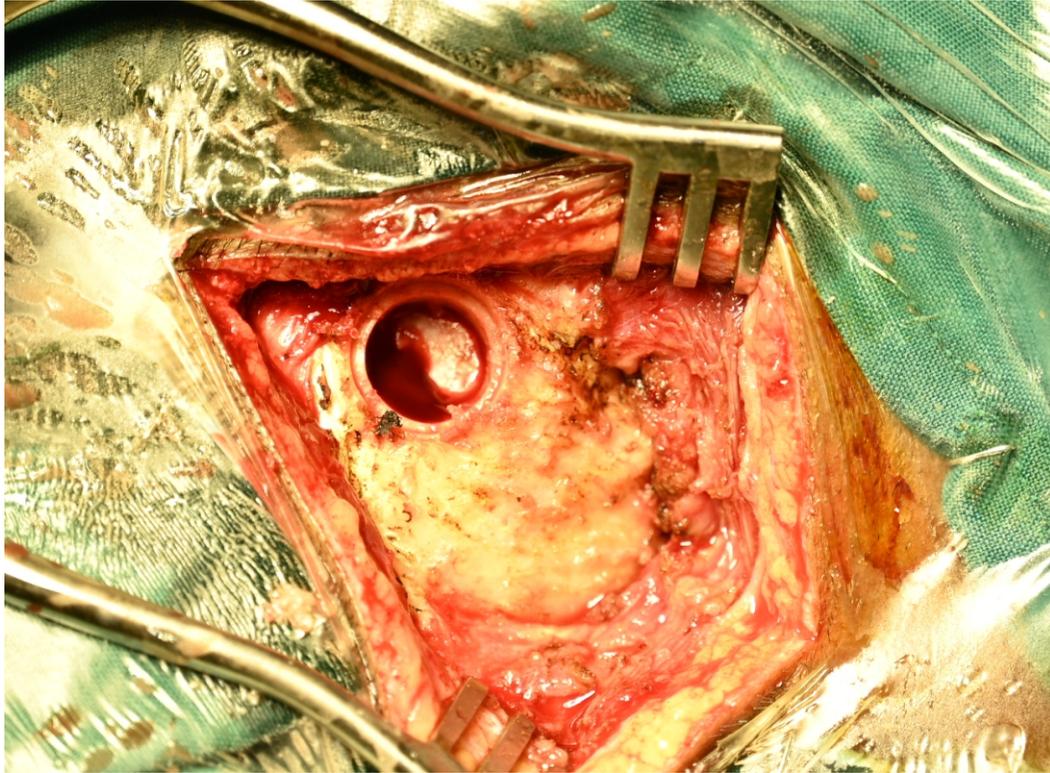
"Posterior fossa mini craniotomy measuring approximately 3×3 cm – the hallmark of a keyhole approach ensuring minimal access with maximal safety."

- Mastoid eminence
- Digastric groove
- Inion

Using an inion-meatal line and vertical line over the digastric groove, the junction of transverse and sigmoid sinuses is located. The burr hole is placed ~1.5 cm above and medial to the digastric groove, ensuring a short incision with optimal exposure.

Step 3: Bone Work – No Burring, Minimal Access

“The sinus junction must be visualized, but mastoid drilling is avoided.”



Burr Hole Placement

“Strategic burr hole placement above the mastoid emissary vein and medial to the digastric groove, guided by external bony landmarks.”

Soft tissue is carefully dissected to expose the digastric groove and mastoid emissary vein, guiding the burr hole. A 3 × 3 cm mini-craniotomy is made using a perforator.

We do not burr the bone unless absolutely necessary. If mastoid air cells are opened inadvertently, they are sealed with bone wax before and after dural closure to prevent CSF leak.

Step 4: Turning the Corner – Gaining Access to the CPA

"This is the most delicate part and demands patience."

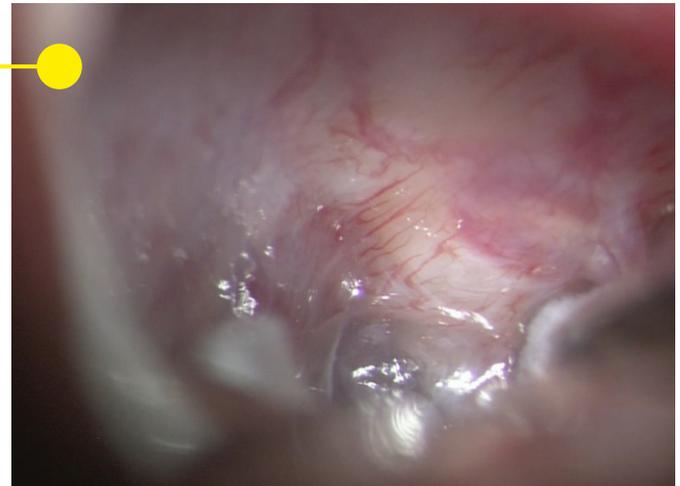


Identifying the Cisterna Magna

"Anatomical exposure of the cisterna magna during CSF drainage to facilitate cerebellar fall and atraumatic access."

Turning the Corner

"Microscopic view of cerebellar relaxation and safe access to the cerebellopontine angle without retraction – the turning point of MVD surgery."

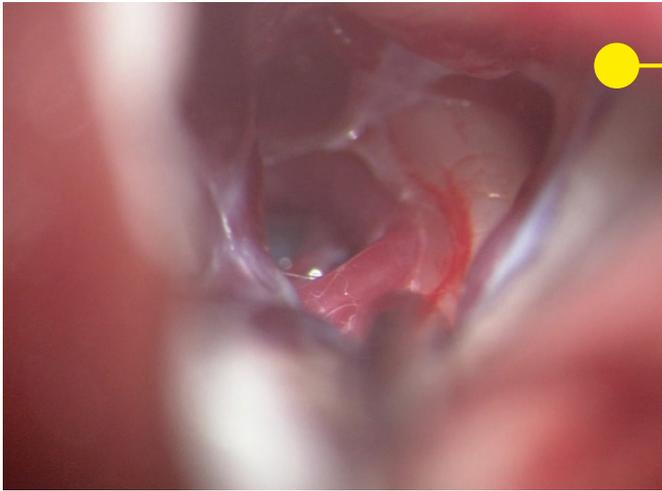


After dural opening, the operative microscope is introduced. CSF is allowed to drain slowly by advancing a cottonoid into the cerebellopontine angle, allowing the cerebellum to fall gently and naturally.

This exposes the trigeminal nerve without cerebellar retraction, preserving neurological integrity.

Step 5: Nerve Decompression – Seek and Separate

“There must be a vessel – and it's our job to find it.”

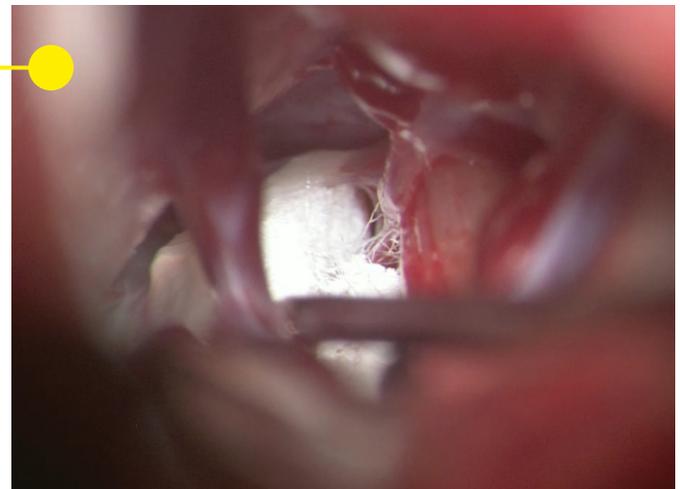


Nerve Root Compression

“Close-up view showing vascular loop impinging upon the root entry zone of the trigeminal nerve – the pathophysiological target of MVD.”

Teflon Placement

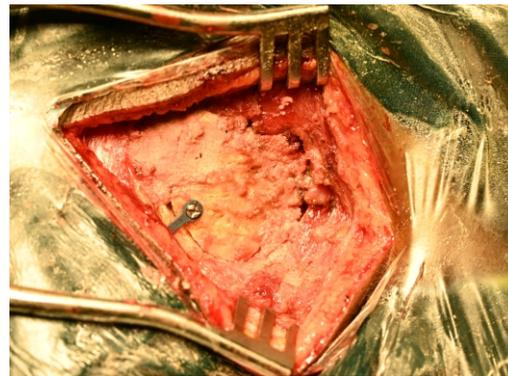
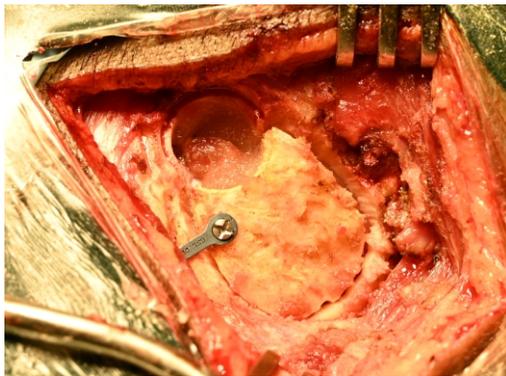
“Precise interposition of non-absorbable Teflon pledgets between the offending vascular loop and the trigeminal nerve to relieve neurovascular conflict.”



The entire length of the trigeminal nerve, from its brainstem origin to its exit in the cerebellopontine angle, is carefully inspected. Arachnoid dissection allows mobilization of compressing arterial loops, typically the superior cerebellar artery.

The loop's memory is reset and Teflon pledgets are inserted gently between the nerve and vessel – without manipulating the nerve – to ensure long-term decompression.

Step 6: Surgical Closure – Integrity Restored



Dural Closure

"Watertight dural closure reinforced with fascial sutures and bone flap secured using titanium miniplates to prevent CSF leak and ensure anatomical restoration."

"A watertight closure is critical to prevent complications." The dura is closed tightly, and the bone flap is replaced with titanium mini plates for rigid fixation. Layer-by-layer closure is performed:

- ✓ Watertight fascial closure using interrupted sutures
- ✓ No drains are typically required
- ✓ Skin closed with minimal scarring

Rapid Recovery, Lasting Results

Patients are typically:

- ✓ Discharged in 2 days
- ✓ Pain-free immediately after surgery
- ✓ Back to daily life in 3–4 days
- ✓ Off medications permanently

Our Results: 112 Success Stories

In the last 8 years, we have performed **112** MVD procedures with outstanding results:

- ✓ **> 95%** immediate pain relief
- ✓ **> 90%** long-term cure
- ✓ **< 2%** minor complications
- ✓ **No** facial numbness or weakness

Why Choose MVD?

Unlike other treatments like radiofrequency ablation or gamma knife, which damage the nerve and may cause facial numbness, MVD preserves nerve function and provides a potential permanent cure.

Final Word

For patients who suffer silently with this devastating condition, Microvascular Decompression offers a life-changing solution. At Neuroone Hospital, we combine cutting-edge keyhole techniques with microsurgical precision to restore not just smiles—but lives.

Surgical Team

Neurosurgery

Dr S Vijay Kumar

Dr Ramakrishna Easwaran

Dr Sadyojata

Anaesthesia

Dr Ramgopal Gupta

Dr S Rakul Prasath

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