



MANAGEMENT OF TRIGEMINAL NEURALGIA: OUR INSTITUTIONAL EXPERIENCE

Neurosurgery

Dr. Hemant R. Sable

M.CH Neurosurgery Resident, Nhl Medical College And V. S Hospital, Ahmedabad.

Dr. Mukesh. P. Patel*

Professor And Head Of Department Of Neurosurgery, Nhl Medical College And V. S Hospital, Ahmedabad. *Corresponding Author

ABSTRACT

Trigeminal neuralgia also called tic douloureux leads to paroxysms of short-lasting but very severe pain. Between attacks, patients are usually asymptomatic, but a constant dull background pain may persist in some cases. The etiology of most cases of trigeminal neuralgia has been suggested to be vascular compression of the central axons of the trigeminal nerve at the level of Ponto cerebellar region. There are a wide range of medical and surgical treatments available. The preferred medical treatment for trigeminal neuralgia consists of anticonvulsant drugs, muscle relaxants and neuroleptic agents. For patient's refractory to medical therapy, Gasserian ganglion percutaneous techniques, gamma-knife surgery and microvascular decompression are the most promising invasive treatment options. This article bring about a retrospective study of 172 patients of trigeminal neuralgia treated by microvascular decompression and percutaneous radio frequency thermocoagulation at a tertiary institute.

KEYWORDS

Trigeminal neuralgia, microvascular decompression, percutaneous thermocoagulation

INTRODUCTION

Trigeminal Neuralgia, also known as Tic Douloureux, is a nerve disorder that causes abrupt, paroxysmal, lancinating, electric-shock-like facial pain⁽¹⁾. Most commonly the pain involves the lower face jaw, but symptoms may appear near the nose, ears, eyes or lip. Etiology is multifactorial, including vascular compression of root entry zone, demyelination, and physical damage to nerve by surgical procedures, tumor and multiple sclerosis etc.⁽²⁾

Chronic vascular compression of the trigeminal nerve has focal demyelination effect. This leads to dysfunction of local inhibitory interneurons and development of ectopic neuronal pacemakers. Attacks may be triggered by things such as touching the face, chewing, speaking and brushing teeth or blow from a fan etc. which usually last for seconds to minutes. The diagnosis is usually made on the basis of a typical history and the exclusion of secondary causes. MRI is done to rule out structural abnormalities. Trigger zones are most commonly located on cheek, lip, nose or buccal mucosa

TREATMENT OPTIONS

Initial management of the pain is medical. Carbamazepine is the drug of choice although some patients respond to other drugs including Gabapentin, Phenytoin, Baclofen, Sodium Valproate and Clonazepam^(3,4,5,6). Surgical therapy should be considered if medical treatment fails or cannot be tolerated^(7,8,9)

INDICATIONS FOR SURGERY:

- Debilitating pain refractory to drugs.
- Patients directly opting-for surgery.
- Failure or recurrence of pain after percutaneous ablative procedures.
- Young age
- No comorbid conditions that contradict surgery
- MRI suggesting a vascular compression

Surgical procedures for trigeminal neuralgia:

- Percutaneous ablative procedures

Radiofrequency thermocoagulation (RFT)/ percutaneous stereotactic

- Radiofrequency rhizotomy (PSR)
- Percutaneous glycerol rhizolysis (PGR).
- Balloon compression (BC)
- Microvascular decompression (MVD)
- Stereotactic radiosurgery
- Gamma knife
- Linac-based
- Peripheral ablative procedures
- Peripheral branch neurectomy
- Alcohol neurolysis
- Open destructive procedures
- Partial sensory rhizotomy

- Sub temporal ganglionectomy (Frazier-Spiller procedure)

SURGICAL TREATMENT

Microvascular decompression – An invasive surgery to place a sponge or Teflon between the trigeminal nerve and the compressive loop of the artery

Rhizotomy – A probe is inserted in the cheek through the foramen ovale and the trigeminal nerve is damaged through multiple techniques including ablation or mechanical damage

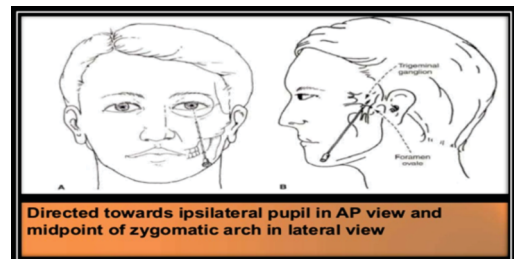


Figure 1(Direction of probe during rhizotomy)

AIMS AND OBJECTIVES

- To analyze the etiopathogenesis of trigeminal neuralgia.
- To study the clinical presentation of trigeminal neuralgia.
- To study the role of Microvascular decompression and radiofrequency thermal coagulation in the management of trigeminal neuralgia.
- To evaluate the results, complications and post-operative follow up of patients after Microvascular decompression and radiofrequency thermal coagulation.

MATERIALS AND METHODS

A retrospective study of 172 patients was done at our hospital that were Diagnosed and confirmed clinically as trigeminal neuralgia over period of 6 Yrs from July 2012 to August 2018.

150 patients had undergone microvascular decompression and 22 had Undergone radiofrequency ablation

Inclusion criteria:

- All patients of trigeminal neuralgia, typical or atypical, referred with medical therapy started.
- Patients taking one or more medications for variable time period, but with no pain relief or recurrence of pain.
- Patients who have had previous surgery or radiofrequency ablation for the same but were not benefitted or have had a recurrence.
- Old age patients with medical comorbidity and high surgical risk

had undergone radiofrequency ablation

Exclusion criteria:

- Symptomatic Trigeminal neuralgia caused by a demonstrable structural lesion other than vascular compression.
- Demographic data collected were name, age and sex. Presenting symptoms were noted and a detailed neurological examination was performed. Data like type of neuralgia (typical or atypical), duration of pain, distribution of pain and which side of face ,surgical findings, complications and long term follow-up were recorded
- MRI with Trigeminal neuralgia protocol (T1, T2, FLAIR, Diffusion and FIESTA sequence) was used as a corroborative investigation for the diagnosis

RESULTS

AGE WISE DISTRIBUTION OF RESULTS

The predominant age group of affected patients was in 51 – 70 years of age. There ages ranged from 30-72 yrs with average age of 53.6 yrs.

GENDER WISE DISTRIBUTION

There was male predominance with 92 male patients (52 %) and 80 female patients (48%) Distribution of patients based on duration of pain Most of patients presented with pain duration for an average of 4.3 yrs with some patients presenting late to opd.

Distribution of patients based on localisation of pain Most patients presented with pain in V2-V3 region i.e. 37% (65 patients) followed by in 42 patients in V1 V2 V3 region i.e. 22.2% and 25 patients in V1 V2 region i.e. 18.5% Distribution of patients based on side of neuralgia 108 patients presented with pain on right side (63%) and 64 patients had pain on left side (37%).

Distribution of patients based on type of neuralgia 126 (74%) patients presented with classical trigeminal neuralgia and 46(26%) patients presented with atypical neuralgia.

Intraoperative findings during MVD In 141 patients (81%), superior cerebellar artery (SCA) was found compressing 5th cranial nerve. In 26 patients (14.8%) there was combined arterial and venous compression i.e. SCA +petrosal vein.

Pain relief after MVD Immediate complete pain relief was achieved in 131 patients (88%), 14 patients (7.4%) had partial relief and 5 patients had no relief Pain relief after radiofrequency thermocoagulation Out of 22 patients, Complete relief was seen in 16 patients (72.7%), 4 patients (18.18) had partial relief and 2 patients (9%) had no relief.

Complications after MVD

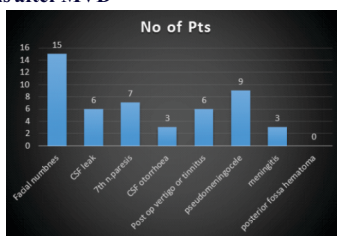


Table 1 (complications after MVD)

15 Patients(10%) had facial numbness,6 patients (4%)had csf leak,7 patients (4.6%) had partial seventh paresis, csf otorrhea in 3 patients (1.5%), meningitis in 3 patients(1.5%), post-operative vertigo or tinnitus in 6 patients (4%), pseudomeningocele in 9 patients (6%).

Complications after Radiofrequency ablation

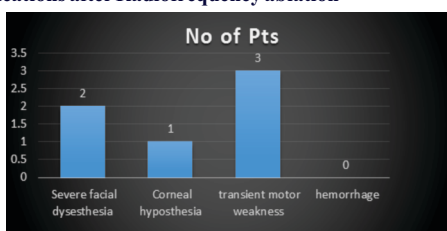


Table 2 (complications after radiofrequency ablation)

2 patients (7%) had severe facial dysesthesia, 1 patient (5%) had corneal hypoesthesia and 3 patients (15%) had transient motor weakness.

CONCLUSION

- Trigeminal neuralgia is predominantly seen in patients aged 50 - 70 years and chiefly involves the V2V3 division of the nerve mostly on right side, predominantly of typical variety with male predominance
- Medical management of the patients, though initially may have a benefit, cannot usually offer complete resolution of the complaint.
- MVD is a safe and effective treatment option in the treatment of patients with typical TN. In atypical TN also MVD is an effective and safe treatment method but with more recurrence rate, probably due to demyelinating changes in the nerve.
- MVD is the interventional treatment of choice for trigeminal neuralgia with better long term pain relief, low recurrence and with less complication rates. .
- Radiofrequency ablation also provides pain relief but is of short term and relief is less as compared to MVD. It is preferable in old age patient >65 yrs, who have associated medical comorbidity and high risk for surgery, in patients with multiple sclerosis and in those who have recurrent pain after MVD.

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