



Novel Approach to Mandibular Neurectomy in Trigeminal Neuralgia-Hashmukh's Technique.

KEYWORDS

Tic Dolorex, Trigeminal Neuralgia, Hashmukh's Operation, Ginwala Technique.

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ABSTRACT Aim Trigeminal neuralgia(TGN) is common disease in routine maxillofacial practice, initially the disease is managed conservatively by medicines, however gradual increase in dosage of medicine and refractory increase in symptoms makes surgery mandatory for treatment. Incidences of involvement of Inferior Alveolar Nerve (IAN) are highest in TGN. Peripheral neurectomy is the first line of surgical treatment which is routinely practiced. In current article, we propose simpler approach for performing peripheral neurectomy (PN). Settings and Design: Multicentric retrospective clinical trial for performing PN in cases of TGN of mandibular nerve was done. Material and Methods: Patients who reporting at clinics in past 3 years, diagnosed as suffering from TGN of mandibular division, not responding to medicines, were considered for the surgery, Hashmukh's operation was performed for PN of inferior alveolar nerve (IAN), and results were obtained by recording, post operative mouth opening, recurrence of symptoms and healing by visual analogue scale on subsequent follow up of atleast 2 years. Result & Conclusion: Hashmukh's Operation seems to be a novel approach, because of ease to perform and less time for complete healing and functioning. We propose that Hashmukh's Operation is a better modality of PN for IAN in cases of TGN.

Introduction:

First known description of TGN or similar disease was written in the second century AD by Areteaus of Cappadocia, a contemporary of Galen. Jujani an 11th century Arab physician, also mentions unilateral facial pain causing spasm and anxiety in his writings. He also suggested that the cause of pain is "the proximity of the artery to the nerve". First comprehensive description of TGN was put forth in 1773 by John Fothergill in his presentation in Medical Society of London. He described typical clinical feature of the disease in detail which included paroxysm of unilateral pain evoked by eating or speaking or touch, starting and ending abruptly and associated with anxiety. Nicolaus Andre coined the term Tic Douloureux for the clinical entity. Sporadic observation in 18th and 19th century by Pujol, Chapman and Tiffany helped to complete the description of TGN from other forms of facial pain like tooth ache.[1]

A diagnosis of TGN is always based on the patient's clinical history. The hallmark pain is described as agonizing, paroxysmal, and lancinating. Pain is perceived in one or more divisions of the trigeminal nerve, is usually brief, with repetitive bursts every few seconds, and may be triggered by activities such as chewing, speaking, swallowing, touching the face, or brushing the teeth.

Trigeminal neuralgia: definition and classification A wide range of surgical treatment modalities can be traced back to 1925, when vascular compression was introduced. However it took almost half a century for micro vascular decompression came in vogue and gained wide spread acceptance as a treatment method.[2] Surgical treatments are generally reserved for patients with debilitating pain refractory to an adequate trial of at least three drugs including CBZ in sufficient dosage. The surgical modalities for TGN includes: (1) Peripheral procedures (targeting portions of trigeminal nerve distal to gasserian ganglion), (2) Percutaneous procedures (targeting gasserian ganglion), (3) Open procedures (posterior fossa exploration) and (4) Stereotactic radiosurgery (targeting trigeminal root).[3]

We, suggest that most of the clinical signs occur due to irritation of the trigor zones (TZ) and therefore, before going for severe ablative surgeries like gasserian ganglion cauterization or radiofrequency ablation, which have 31% relapse in first 12 months, patient should be considered for Peripheral Neurectomy (PN).

Materials and Methods

Ginwala, described an incision to approach mandibular nerve at the mandibular foramen for conducting a PN, where he described the incision along the anterior border of ramus of along the ascending coronoid process of mandible, and splitting the mucosperiosteal flap in form of an inverted "Y" at the juncture of internal and external oblique ridges, for the exposure of the mandibular nerve, which is situated at the mandibular foramen on the medial aspect of ramus of mandible below the lingula. We propose, Hashmukh's Operation (named after Dr. Hashmukh Varma), in which we have made a 1 cm incision (Pushkar's Incision, named after Dr. Pushkar Waknis) (figure 1) at the anterior border of ramus of mandible at the coronoid notch. Mandibular nerve is identified after careful dissection of temporalis muscle fibers by a nerve hook. Gentle twisting motions are made to release the nerve, which is then ligated at proximal and distal part after transaction. Another incision is deepened through mucosa, muscle and periosteum at the premolar region of mandible and mental foramen is identified. Gentle teasing motion of mental nerve is commenced till the entire IAN branch of mandibular nerve is excised from the body of mandible. Complete nerve excision can be ascertained by confirming the ligature at distal end of the nerve being identified. Gentle teasing of mental nerve is done to deliver it from adjoining soft tissue adnexia in premolar region. Mental foramen is sealed by placing a 5mm Titanium screw after osteotomy preparation, under continuous irrigation of normal saline at room temperature. Closure is commenced at both the surgical sites by a resorbable suture to facilitate healing(4-0 Vicryl NW 2443). Patients are then followed up for 7th post day, 12th post op day, 6 months post op, 12 months post op, 18 months post op and 24th month post op.

Case Report:

Authors serve as Consultants to various hospitals in the city of Bhopal and Pune. Patients who were referred to the clinics diagnosed as suffering from TGN of mandibular division of trigeminal nerve, not responding to medicinal management for at least 3 years, complaining of recurrent bouts of pain, were selected for the study. A total of 10 patients who were otherwise systemically fit for surgery, were included in the current study. TZ were marked by a removable ink on the patient's face and clinical picture were taken for future reference. After informed consent and discussing the complications and relapse rate of the surgery, PN was planned by Hashmukh's Operation. Patients were discharged on 7th day post operatively and kept on regular follow up for atleast 2 years.

Results:

Post operative mouth opening at first follow up was 3.0 cm with $SD \pm 0.5$ cm, difficulty in mouth opening was observed in one case which prolonged for more than 7 days. All the patients operated by Hashmukh's Technique had satisfactory mouth opening and mandibular movements from 2nd follow up visit. Permanent sensory loss was observed in all the cases. After 1 year of follow up, no patient reported with the symptoms of neuralgic pain. After 18 months post operatively, 2 patients reported, tingling sensation in the area of surgery and no symptoms were reported at previously depicted TZ. 2 patients reported to the clinics after 3 months post operatively, with infection of the screw, which had to be surgically delivered out of the mandible. 3 out of 10 operated patients reported recurrence of the symptoms of TGN at different TZ when compared to their clinical photographs after 2 years of follow up, out of those 3 patients 1 patient had undergone removal of the screw at 3rd post operative month. PN is an established approach in treatment of TGN. Patients who are refractory to medicinal management, reluctant to undergo sever ablative surgeries, not convinced by the outcome of brain surgeries, and should be considered for PN prior to advance treatment modalities. Ginwala's approach to mandibular nerve, causes more trauma to the temporalis muscle fibers, which is one the principal muscle for mandibular movements. This increases the discomfort to patients to revert back to their normal life style and functional and parafunctional mandibular movements and increases morbidity. Hashmukh's Operation with Pushkar's incision reduces this discomfort. This technique is easy, less morbid, requires minimal surgical skills and can be practiced by young maxillofacial surgeons also. Therefore in our opinion Hashmukh's operation with Pushkar's incision appears to be a better modality for peripheral neurectomy of IAN of mandibular division of trigeminal nerve in cases of medicinally refractory TGN. Nevertheless we also suggest that this study should be considered for clinical trial at more number of centers and with larger sample size for a better learning and understanding of the disease and improving the quality of treatment options for the patients.

Discussion:

The general recommendation is to start with medical therapy and consider surgical procedures in patients who are refractory to medical treatment. First-line therapy should be carbamazepine (CBZ; 200_1200 mg/day) and oxcarbazepine (OXC; 600_1800 mg/day) according to current evidence-based treatment guidelines [4], however, over time, higher doses may be needed to maintain efficacy, which declines to approximately 50% of patients due to auto-induction of CBZ [5]. Common initial side effects include drowsiness, nausea, dizziness, diplopia, ataxia, elevation

of transaminases and hyponatremia. Potentially serious but uncommon side effects are allergic rash, myelosuppression, hepatotoxicity, lymphadenopathy, systemic lupus erythematosus, Stevens_Johnson syndrome and aplastic anaemia. Second-line treatment is based on very little evidence and includes add-on therapy with lamotrigine (400 mg/day) [Zakrzewska et al. 1997], or a switch to lamotrigine, baclofen (40_80 mg/day) [Fromm et al.1984] or pimizide (4_12 mg/day).[6]

Legends**Pushkar's Incision****Identification of mental nerve****References**

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