

Trigeminal Neuralgia: Microvascular Decompression is the Ultimate Answer

Islam MA, Shahriar R, Chowdhury RU, Salek MAA

Abstract:

Trigeminal neuralgia also known as 'Fothergill's disease' or 'tic douloureux' is a very peculiar disease. The severe pain is paroxysmic and can be triggered by a mild cutaneous stimulus on the face or "trigger zone". The disease has a wide variety of etiology and clinical presentation. The management will include both medical and a surgical approach. A 58-year-old female patient had reported with a complaint of pain for 8 years. On thorough history taking and clinical examination, we were able to confirm the final diagnosis as trigeminal neuralgia (TN). We present a case of trigeminal neuralgia of the maxillary and mandibular division along with clinical history, MRI (Magnetic Resonance Imaging) findings and treatment approach.

Bang. J Neurosurgery 2019; 8(2): 105-107

Introduction:

Trigeminal neuralgia (TN) is called as tic douloureux, meaning "painful tic" in French, was first explained by Arateus in the first century AD. Later, Nicolaus Andre described the TN as a distinct clinical disease in 1756. TN is the most common orofacial pain under neuralgia and is among the most painful conditions in orofacial pains. TN causes physical distress to the patient, moreover, it causes psychological distress to the patient which compromises their quality of life. Causes for TN may be neoplasia, diseases of the connective tissue, infections, and demyelination of nerve or can be of idiopathic nature.¹

The largest cranial nerve is the trigeminal nerve which got its name - "trigeminal" - is derived from the fact that each nerve, one on each side of the pons, has three major branches: the ophthalmic nerve (V1), the maxillary nerve (V2) and the mandibular nerve (V3). Purely sensory are the ophthalmic and maxillary nerves, the mandibular nerve has both sensory and motor functions

Case Report:

The patient Mrs. Masuma Begum 58 years of age admitted in CMH Dhaka with the complaints of pain in right side of the face for 7 years. She mentioned that pain aggravates while eating, swallowing, washing her face, clenching her teeth and even on touching. She doesn't experience pain while sleeping. Patient described the pain as severe, unbearable, intermittent, shock like and unilateral. She visited a private dentist in Dhaka and also consulted to neurophysician. The patient was treated by conservative treatment for last 7 years. For last 7 months she is refractory to conservative treatment. She is hypertensive for 5 years and under control with medication. On examination Pt is conscious & oriented. GCS -15/15 Pupils : Bil reacting to light. Haemodynamically stable. Hyperesthesia rt side of face. MRI & MRA brain – Revealed vascular loop of right superior cerebellar artery crossing right Trigeminal nerve.

Operative procedure- Patient placed in park bench position with right side up. S shaped incision given in right suboccipital retromastoid region. Craniotomy done upto Transverse and sigmoid sinus. Durotomy done under microscope. Superior cerebellar artery found compressed by trigeminal nerve (rt). Artery was isolated from surrounding tissue. Fibrosis is released. A patch of artificial dura placed in between artery and nerve (Teflon not available). Haemostasis secured. Dura repaired air tight. Skin closed in layers keeping a drain.

1. Col. (Dr.) Md. Aminul Islam, Head of Department of Neurosurgery, CMH, Dhaka.
2. Maj. (Dr.) Rajib Shahriar, Consultant Surgeon, Department of Surgery, CMH, Saidpur.
3. Col. (Dr.) Rukun Uddin Chowdhury, Consultant Neurosurgeon, Department of Neurosurgery CMH, Dhaka.
4. Lt. Col. (Dr.) MAA Salek, Consultant Neurosurgeon, Department of Neurosurgery CMH, Dhaka.

Address of Correspondence : Col. (Dr.) Md. Aminul Islam, **Head,** Department of Neurosurgery, CMH, Dhaka.



Fig.-1:

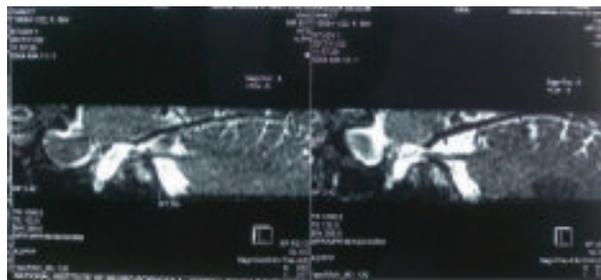


Fig.-2:

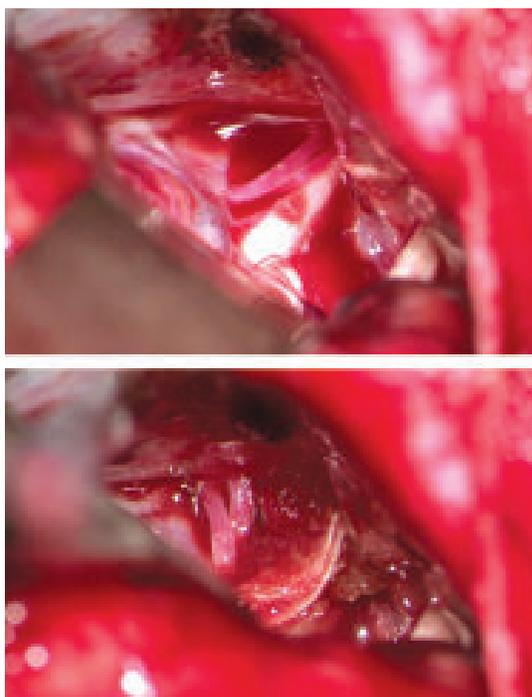


Fig.-3:

Discussion:

TN is not very common in neurosurgical patient ; it is also not common in armed forces military hospitals .It is also difficult to diagnose the case with proper clinical evaluation. It is an absolute clinical diagnosis, need careful evaluation of the patient. The classical TN has some diagnostic criteria which is mentioned in table 2.

Table-II

Diagnostic criteria for classic trigeminal neuralgia

Paroxysmal attacks of pain lasting from a fraction of a second to 2 min that affects one or more divisions of the trigeminal nerve

Pain has at least one of the following characteristics: Intense, sharp, superficial, or stabbing precipitated from trigger areas or by trigger factors

Attacks are similar in individual patients

No neurological deficit is clinically evident

Not attributed to another disorder

There are some etiological factors are considered to cause the problem..The etiological factors may be grouped into three major theories . 1) Disease related 2) Direct injury to the nerve and 3) Poly etiologic origin although compression of the trigeminal nerve root is considered the most common cause of neuralgia nerve (Table 3).

Table-III

Related to systemic Diseases: Multiple Sclerosis vascular diseases, rheumatism etc Injury to Trigeminal nerve Directly :

Peripheral nerve: "Compression syndrome hypothesis" due to narrowing of the canal, trauma etc and "Allergic Hypothesis" infection, ENT pathology etc

Central nerve: "Neurovascular compression Hypothesis" arteriovenous malformation, , meningiomas. Schwannoid cyst, aneurysms, tuberculomas etc.

Idiopathic Causes : Conditions that evoke dystropy and demyelination.

The treatment modalities of TN can be divided into pharmacological and surgical intervention. In general, patients show a good response to drug therapy with over 80% using anticonvulsants. Carbamazepine

(Tegretol, Summit) is generally used as the first drug of choice in the management of TN. Its mechanism of action is neuronal excitability depression, blocks Na⁺ channels, thereby leading to a selective reduction in the ectopic neural discharges that are responsible for the pain. This drug is used for therapeutic diagnosis of TN. Usually, we start with low dose and gradually increase the dosage. Maximum dosage of carbamazepine that can be given is 1200-2400 mg. Periodic follow-up and blood tests should be conducted to rule out neutropenia as it is an adverse effect of long-term use of carbamazepine. Second-line therapeutics includes drugs such as phenytoin and baclofen, which has carbamazepine-like mechanism of action. Other drugs such as pimozide, sodium valproate, and clonazepam are also used. Clonazepam 0.5 mg t.i.d is preferred dosage. However, the drawback is that these drugs have shown unclear efficacy. These drugs are associated with major side effects such as nausea, weakness, gingival enlargement, ataxia, and erythematous skin rashes. For approximately 30% of patients with TN, pharmacological intervention fails due to unsuccessful pain control or because of the adverse reactions of the drugs, and 50% eventually become unresponsive due to the tolerability of medication. For these patients, surgical procedures are carried out. Cryotherapy, alcohol or anesthetic injection, or neurectomy will help in attaining peripheral block of trigeminal branches. Cryotherapy when performed leads to necrosis of the affected nerve branch. This method initially gives good results but has higher recurrence rate. The surgical management of trigeminal neuralgia is resorted as a treatment only when the medical management does not provide relief for the patient and pain continuous to manifest its severity. Just as our patient experienced severe pain even after a trial of various drugs. The surgical management include the following procedures Microvascular decompression, Glycerol gangliolysis,

Radiofrequency gangliolysis, Balloon compression, Stereotactic radiosurgery, peripheral neurectomy, Cyber knife in trigeminal neuralgia etc.. The choice and prognosis of surgical management depends upon the etiology of the disease and also patient considerations like age and associated diseases. Our patient underwent microvascular decompression which gives a good outcome.²

Conclusion:

it is important to recognize that very small tumors would cause TN. Since such tumors can be overlooked on routine MR studies, high-resolution thin-sliced MR examinations and careful radiological interpretations are required for correct diagnosis and treatment. But most important thing is, if no definite pathology is identified and patient having pain refractory to medical treatment: micro vascular decompression is the final remedy.

References:

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