

Gasserian ganglion thermal radiofrequency and alcohol ablation therapy in patients with an idiopathic trigeminal neuralgia Of 20 years duration

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Abstract

Trigeminal Neuralgia (TN) is a neuropathic, stabbing recurrent episode of pain within the distribution of one or more branches of the trigeminal nerve affecting the face. Trigeminal neuralgia is idiopathic in 50% of the patients leading to focal demyelination and aberrant neural discharge.

Treatment must be individualized to each patient. Carbamazepine remains the drug of choice and the first-line treatment of TN but ineffective in 60%. Minimally invasive interventional pain therapies and surgery are possible options when drug therapy fails. Patients with poor surgical risk may be more suitable for other types of interventional therapy.

A case of idiopathic trigeminal neuralgia in a 49 years old female, presented with a 20 years history of severe lancinating intermittent pain, not relieved by oral medications. In our case we will discuss the role of radiofrequency therapy in combination with alcohol ablation for this chronic pain and follow up for 1 year duration.

Keywords: Trigeminal Neuralgia, Radiofrequency, Alcohol ablation therapy .

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INTRODUCTION

Trigeminal Neuralgia (TN) is the most painful condition known to man and severely affects quality of life in some patients^[1], usually unilateral, brief, stabbing recurrent episodes of pain within the distribution of one or more branches of the trigeminal nerve the 5th cranial nerve^[2] as seen in Figure(1). It is a chronic condition, resulting in sporadic intense burning and shock-like pain lasting for seconds to minutes that can be incapacitating to patients. Atypical TN includes additional features such as continuous pain and sensory disturbances in the area innervated by one or more branches of the trigeminal nerve^[3]. It commonly affects patients aged over 50 years and occurs more frequently in women than men with a ratio of 1.5:1-2:1^[4]. The diagnosis is made on history alone, and time needs to be taken to elicit the key

features and differentiate from toothache or one of the trigeminal autonomic cephalalgias. Most trigeminal neuralgia is idiopathic^[2].

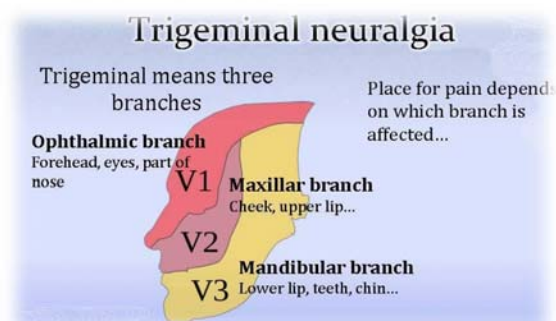


Figure 1. Anatomical Divisions of Trigeminal Nerve

There is convincing evidence that the idiopathic form develops from focal demyelination at the trigeminal root entry zone with subsequent ephaptic cross-talk between axons^[5], but a small percentage is due to secondary causes—for example, tumors or multiple sclerosis which can be picked up on CT – Scan or MRI^[2], attention should be paid to the possibility that lateral extension of a pituitary tumors into the cavernous sinus may compress the trigeminal nerve divisions and presented as 5th cranial nerve palsy^[6].

Recently published international guidelines suggest that carbamazepine and oxcarbazepine are the first-line drugs. There is limited evidence for the use of lamotrigine and baclofen. If there is a decrease in efficacy or tolerability of medication, surgery needs to be considered^[2].

Pharmacological treatment is effective only in 60% of patients, surgical options include: microvascular decompression; balloon compression; radiofrequency thermocoagulation or glycerol rhizotomies; and subcutaneous alcohol branch blockade. Stereotactic gamma knife radiosurgery is a further option. Motor cortex stimulation and transcranial magnetic stimulation, although having shown initial promise for trigeminal neuropathic pain, seem to be ineffective for classical TN. The choice of drug, whether or when to operate, and which procedure to choose should be individualized to the particular needs and conditions of the patient^[7].

CASE REPORT

A 49 years old married female, attended to the pain clinic at Sheikh Zayed Hospital, complaining from right facial pain. The pain was intermittent with attack of sudden lancinating (like electric shock) with devastating intensity lasting only few seconds. Sometimes the complaint was coming in attacks of multiple severe pain one after the other and sometimes the pain was continuous and experienced in both maxillary and mandibular branch of trigeminal nerve. The painful attack is unilateral and is at right nasolabial area, induced by eating, speaking and cold weather, not relieved by drugs, and is not associated with vomiting.

The patient has no history of hypertension or diabetes mellitus, no history of smoking, no alcohol consumption no trauma, no familial history, no history of visual disturbances, and no history of face surgery. The patient complaining from this pain since her twenties and she was diagnosed as idiopathic trigeminal neuralgia and she was seen by many physicians inside and outside the country with prescription of, pain medications and anti-seizure

medications, also she had tried acupuncture, physiotherapy for pain control, unfortunately longer-term relief could not be obtained.

Her condition getting worse when the number of her oral carbamazepine tablets (200mg) reached 11 tab/day, during clinical examination found that she rated her pain at 10/10 on a numerical rating scale, the worst pain she had.

Neurological examination of the cranial nerves found no sensory loss at the trigeminal distribution, the motor and sensory examinations are normal; medical examination was normal; no meningeal or cerebellar sign, MRI brain and CT –Scan were normal.

At Sheikh Zayed Hospital she received 4 sessions of radiofrequency ablation therapy at right trigeminal nerve with maxillary branch according to anatomical landmark, procedure was done under full aseptic technique.

Intravenous access is obtained, and standard monitors including electrocardiogram, blood pressure monitoring, and pulse oximetry are applied. Sedation is usually necessary to increase patient comfort and reduce anxiety with fentanyl 50 mic and midazolam 1 mg as premedication.

The patient is positioned in supine decubitus with the Patient head is in extension, rotated approximately 30° opposite to the painful side; with the mouth open, the foramen ovale is identified medially to the mandibular ramus. The insertion point is 3 cm lateral to the lip commissure, following an imaginary line to the pupil with the target at a 3 cm depth anterior to the external auditory meatus lidocaine 2% about 3 ml as local injection then a 22-gauge, 10 cm-long radiofrequency cannula with an active tip is directed towards the medial portion of the foramen ovale then the foramen was entered.

The stimulation process is initiated with the tip inside the foramen in order to determine which branch is blocked for stimulation to be considered, adequate, thresholds must be lower than 0.4 volts. Once the target branch is identified, deep sedation is administered in order to perform the lesion with an initial test at 40° for 30 sec. in order to test for tolerance, the final lesion is performed at 80° for 90 sec.

The patient is awakened in order to assess the result and determine the need for a repeat procedure. Two lesions – maximum three – were performed based on the response and the branches involved, interval about one month duration between each session, the patient during this period get moderate improvement and according to her description, her pain subside about 50% with decrease

dose of carbamazepine to 2tab/day, after last fourth session she received radiofrequency ablation therapy with alcohol 1% about 2 ml, the patient visited the pain clinic after 10 months she get good improvement. She reported her symptom improvement verbally using a scale of 1–10 with no pain improvement being 0 and all better being 10 (or 100%) with decrease the dose of carbamazepine (200mg) about 1 tablets every other day.

Overall, she was pleased with the treatment outcome as it helped to control her pain and improve quality of her life, with decrease medication doses.

She received another session of radiofrequency and alcohol ablation therapy on the same basis above as pain return back with less frequency and less severity after 10 months improvement, and at the most recent follow-up, she is “better than ever”, without significant head or face pain for the past 3 months and with her oral medication of carbamazepine about ½ tablets every other day.

DISCUSSION

TN continues to be a treatment challenge for physicians to successfully manage and remains the cause of great suffering, impaired function, and poor quality of life for afflicted patients^[8].

Documented cases of TN have dated back to the 18th century. Today, there are roughly 140,000 people suffering from this condition. Conventional treatments for this disorder include medical management with anti-convulsants such as carbamazepine, which decrease the nerves response to peripheral stimulation. These agents have good initial pain relief, but relief rates fall off dramatically over the long-term. Cases refractory to medical management can be treated with surgical microdecompression or minimally invasive procedures such as Peripheral techniques including the administration of streptomycin, lidocaine, alcohol and phenol, cryotherapy, acupuncture or surgical section over distal nerve portions. However, most of these therapies have not been effective and one-year recurrence is greater than 50%^[7].

Thermal Radiofrequency (TR) consists of using heat to destroy nociceptive A-delta and C fibers, sparing the A-alpha and beta fibers responsible for tactile sensation, considering that lower temperatures are needed to create a lesion in the former^[9].

The treatment of patients with idiopathic TN is often a challenge in clinical practice, and conservative management with drug therapy is always the first-line

treatment. When drugs are not efficacious or produce intolerable adverse effects, interventional pain treatment or surgery is the possible option^[4].

Patients with TN who have good to excellent pain relief with a diagnostic trigeminal ganglion block may be suitable candidates for percutaneous RF rhizotomy, especially if the pain relief is of a short duration. It is performed by destruction of the trigeminal ganglion or roots using RF.

RF is the most common percutaneous procedure used to treat TN, especially in elderly patients^[4] in RF rhizotomy, initial pain relief can be achieved in 98% of patients, as high as that obtained with MVD^[10].

Among the various interventional pain therapies, RF rhizotomy offers the highest rate of complete pain relief^[4] Although 15%–20% of patients may experience recurrence of pain in 12 months, recurrence rate is the lowest among all the percutaneous techniques^[11].

It can be repeated in the same patient if required. In addition, it is a viable option for poor surgical risk patients or for elderly patients who are not fit for MVD because of lower morbidity and mortality rates associated with RF rhizolysis.

Our case report showed idiopathic trigeminal neuralgia with long standing complain of chronic pain and suffering for about 20 years on oral medical treatment with increasing the dose and suffering from drug side effects, we tried multiple sessions using combination of 2 models of therapies which was used for 1st time in our country alcohol ablation therapy and radiofrequency, we notice good immediate improvement after therapy and significant pain relief without significant complication.

In comparison to other studies which only use alcohol ablative therapy showed result that alcohol injections may provide temporary relief for trigeminal neuralgia. Pain relief usually lasts days to months and the treatment often must be repeated^[12], other studies showed that among the various interventional pain therapies, RF rhizotomy offers the highest rate of complete pain relief^[4].

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rhizolysis, regarding associated complications for this technique.

In a large-scale, long-term follow-up of 1600 patients who had received percutaneous RF rhizotomy of the trigeminal ganglion, complications reported include diminished corneal reflex (5.7%), masseter weakness and paralysis (4.1%), dysesthesia (1%), anesthesia dolorosa (0.8%), keratitis (0.6%), and transient paralysis of cranial nerves III and VI (0.8%). Permanent cranial nerve VI palsy was observed in two patients, CSF leakage in two, carotid-cavernous fistula in one, and aseptic meningitis in one^[13].

TN is a disease with significant deleterious effects on quality of life. Interventional procedures are being used at present time with good results. In our experience, radiofrequency thermal ablation of the Gasserian ganglion is an effective technique with a low complication rate, available in our setting that can be repeated and should be further evaluated in a large patient group with long term follow up.

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