

Use of glycerol in treatment of refractory trigeminal neuralgia - A report of 2 cases

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Abstract

We present 2 cases of Trigeminal neuralgia (TN) refractory to medicinal therapy. The patients had pain that was unilateral along distribution of the trigeminal nerve trunk, particularly the second and third trunk. Peripheral glycerol injection is a “minimally invasive therapy” that can be considered for patients refractory to medicinal treatment. Ease of administration and repeatability favors its use in a clinical setup. Both the patients responded very well to the treatment and 6 month follow up showed no recurrence of TN.

Keywords: Trigeminal neuralgia, Glycerol injection, Treatment.

Introduction

Trigeminal neuralgia (TN) is characterized by sudden, paroxysmal, excruciating electric shock like pain which can cause severe distress and morbidity. The causes of trigeminal neuralgia include compression of trigeminal nerve by vascular loops at some distance (few millimeters) to the pons. Other causes include multiple sclerosis, arterio-venous malformation and tumors.¹ Various authors have made a significant contribution by articulating precise and succinct diagnostic criteria for TN.² The current International headache society criteria (International Classification of Headache Disorders II (ICHD-II)) places trigeminal neuralgia under general classification of cranial neuralgias and central cause of facial pain, as a definite clinical diagnosis.³ Treatment can be medicinal, minimally invasive or surgical. Pharmacologically, Carbamazepine is the first choice of drug. But some patients may be allergic, non-responsive or intolerant to this drug. In case, monotherapy does not suffice, baclofen and clonazepam may be added. The second line of medicinal therapy includes monotherapy with phenytoin and valproate. Minimally invasive therapy includes peripheral 100% anhydrous glycerol injection and absolute alcohol injection. Other approaches include peripheral neurectomy, cryotherapy, microvascular decompression, radiofrequency, thermocoagulation and gamma knife radiosurgery. Peripheral glycerol injection technique is simple, quick and easy to perform and can be used as outpatient procedures. Also it is valuable when the patient cannot tolerate surgical procedures. Following are two case reports treated with 100% glycerol injection, refractory to medicinal therapy.

Case Report 1

A 70 year old, male patient, reported to the Department of Oral & Maxillofacial Surgery with chief complaint of sharp, shooting electric shock like,

intermittent pain in the left lower premolar region for past 6 months. Past medical history revealed that he was previously diagnosed with trigeminal neuralgia and was under medication for past 2 years. Now, for the last 3 months he had the same sign and symptoms as mentioned above. Patient gave a score of 10 on Visual Analogue Scale (VAS). On extra-oral examination, face was symmetrical and a trigger point was identified at 1 cm below corner of mouth (left side) (Fig. 1). Lymph nodes were not palpable. On intra-oral examination, patient had edentulous upper and lower jaws. Orthopantomogram (OPG) revealed no abnormalities. A diagnostic local anaesthetic agent, 1 ml of 0.5% Bupivacaine, was injected at left mental nerve region. After injection the patient was completely asymptomatic till the action of bupivacaine persisted. Hence, a diagnosis of Refractory Trigeminal Neuralgia was made involving left mental nerve. Informed consent was taken from the patient, 1.5ml of anhydrous glycerol (100%) was injected near the mental nerve through extraoral approach. The patient was also started on Tablet Carbamazepine 200 mg TDS. Patient was recalled after 1 week and he had marked reduction in pain. On 6 month follow up, patient was pain free without any complication.



Fig. 1: Showing trigger point at left mental region (Frontal view and Profile view)

Case Report 2

A 45 year old female patient, reported to the Department of Oral & Maxillofacial Surgery with chief complaint of sharp, shooting electric shock like, intermittent pain over left ala of nose and adjacent area since past 6 months. The pain radiated to the left temporal region. Past medical history revealed that she had been diagnosed previously with Trigeminal neuralgia and had undergone medicinal therapy for the same. Patient gave a Visual Analogue Score of 9. On extra-oral examination, face was symmetrical and revealed a trigger point adjacent to left ala of nose 2 cm below the infra-orbital rim (Fig. 2). Intra-orally she had full complement of teeth. Intra oral radiograph of the area revealed no pathology. A diagnostic local anesthetic agent 1 ml of 0.5% Bupivacain was injected at left infra-orbital foramen region. After injection the patient was completely asymptomatic till the action of bupivacaine persisted. Hence, a diagnosis of Refractory Trigeminal Neuralgia was made involving left infra-orbital nerve.

Informed consent was taken from the patient. 1.5 ml of anhydrous glycerol (100%) was injected near the infraorbital nerve through extra-oral approach (Fig. 3). The patient was also started on Tablet Carbamazepine 200 mg TDS. Patient was recalled after 1 week and she had marked reduction in pain. On 6 months follow up, patient was pain free without any complication.



Fig. 2: Showing trigger point at left infraorbital region (Frontal view)



Fig. 3: Extraoral technique of giving glycerol injection

Discussion

TN presents itself with periods of remissions and exacerbations.⁴ It is caused due to anomalies in the root entry zone of trigeminal neuralgia, the gasserian ganglion or the trigeminal nerve itself.⁵ Loeser et al. gave the theory of presynaptic inhibition. They showed that focal changes in the myelination or the axon diameter of Vth cranial nerve could cause TN.⁶ The symptoms of TN can also be explained by ignition hypothesis.⁷ According to this theory, physiological changes are induced, resulting in growth of functional and hyper excitable primary sensory neurons. The discharge from a single neuron quickly spreads and activates the whole set of neurons. This sudden discharge can be related to the sudden, piercing pain that is characteristic of TN. This model can, thus, be used for further research and clinical investigation. Clinical evaluation of any patient with trigeminal neuralgia should include head and neck examination with special attention to trigeminal sensory system. Careful search for cutaneous /intraoral trigger zones should be done. Oral cavity, oropharynx, salivary glands and associated structures should be carefully examined to rule out odontogenic or nonodontogenic source of pain. According to White and Sweet, there are 5 clinical features to diagnose TN which are as follows: The pain is unilateral, paroxysmal, provoked by trigger zones and is along distribution of trigeminal nerve. Clinically sensory examination is normal. Typically pain is relieved by low dose carbamazepine gradually titrated to higher dose, if required. In patients with intolerability to carbamazepine and refractory TN, a variety of other procedures like glycerol rhizotomy, balloon microcompression, radiofrequency rhizotomy and stereotactic radiosurgery can be employed to induce axonal degeneration of nerve.⁸ These procedures provide excellent pain relief but late relapse is often a possibility. Hakanson was the first to inject anhydrous glycerol into trigeminal cistern in 1981. Stajcic (1989) introduced peripheral injection into the different affected nerves.⁹ He stated that comparative results can be obtained with percutaneous retrogasserian glycerol injection and peripheral glycerol injection with the latter providing faster pain relief with less side effects.¹⁰ Various authors have also reported breakdown of myelin sheath and lysis of axon after peripheral glycerol injection.¹¹ Al-Kateeb (1998) concluded that relief of pain obtained with extra neural glycerol injection is related to partial dehydration and compression of the affected nerve with little evidence of actual destruction.¹² Factors determining the choice of procedure depends on age of patient, symptoms of patient, clinical co-morbidities and prior treatment modalities. Acceptable level of side effects and complete pain relief should be the goal of treatment.^{13,14} Also, treatment should be free of relapse. Many patients are unable to tolerate extensive surgical procedure due to infirmity or financial constraints. Therefore there is

this need for a minimally invasive technique for pain removal/treatment that can be repeated without many side effects. Glycerol injection fits right here.

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