ORAL MEDICINE

TRIGEMINAL NEURALGIA: CASE REPORTS OF TWO DIFFERENT TREATMENT MODALITIES

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ABSTRACT

The aim of this study was to compare results of two different treatment modalities recommended for trigeminal neuralgia (TN). TN is a debilitating disorder that typically occurs in middle to old age with a slight female predominance. Six cases are presented with trigeminal neuralgia, all cases were treated with medications including carbamezapine and showed various degrees of response and no complete relieve of severe pain. Patients were not satisfied with pharmaceutical treatment. This required resort to other methods of treatment prior to the traditional nerve surgery. Three were treated with radiofrequency thermal rhizotomy (RTR) and the other three with auricular electrical stimulation (auriculotherapy). Numerical rating scale was used. The cases highlight variable responses to these two treatment modality, both are not considered permanent management for TN with RTR having a longer-term of pain relief effect than auriculotherapy, whereas auriculotherapy shows no side effects.

Key words: trigeminal neuralgia, auriculotherapy, carbamezapine, radiofrequency thermal rhizotomy, acupuncture.

INTRODUCTION

Trigeminal Neuralgia (TN) was not well described in ancient medicine, and not until the eleventh century did the first description of this problem reach the medical literature. These early accounts realized the nature of the problem with descriptions of severe spasms of facial pain, without loss of power or sensation. The relationship of the pain to the jaws and the roots of the teeth was also noted. At that time, one of the recommended treatments was wine and rest in a darkened room, a home remedy not uncommon today.2

TN is a debilitating disorder that typically occurs in middle to old age individuals. It is the most common cephalic neuralgia in people over the age of fifty, with a mean incidence of 4 per 100,000.3 It is among the most challenging pain conditions in the orofacial area.4 Early literature suggested a strong preponderance in woman; however, current data indicate that only approximately 60% of patients with TN are female.5 The disease is commonly idiopathic although it is thought that the most likely pathogenesis involves demyelination of the retrogasserian ganglionic fibers just before entry into the pons, with or without associated localized...
In about 60% of cases, the maxillary and mandibular divisions or the maxillary branch alone are affected. Only 3% to 10% of cases are bilateral. Neuralgia is typically characterized by unilateral pain attacks that start abruptly and last several seconds but may persist for 1 to 2 minutes. The pain quality is usually described as sharp, stabbing, lancinating, electric shock-like, burning and excruciating. The attacks are initiated by non-painful physical stimulation of specific areas (trigger points or zones) that are located ipsilateral to the pain such as talking, eating and touching. In most cases, the trigeminal points are found in the region supplied by the trigeminal nerve although there have been reports of trigger points outside the innervations of the trigeminal nerve. Each paroxysm of severe pain is followed by a pain-free refractory interval that can last several minutes. In rare cases, however, attacks can follow each other almost continuously.

The condition is usually treated with carbamazepine (which still remains the first line of treatment) or other anticonvulsant drugs, but surgical management including cryotherapy, alcohol injections, thermocoagulation, neurectomy, radiofrequency, intracranial microvascular decompression, glycerol rhizolysis, posterior fossa exploration and more recently gamma knife radiosurgery has also been reported. Prior to resorting to invasive surgical procedures, attempts must be made to relieve pain through other treatment modalities. Alternative treatments that may be beneficial in this type of disorder are auriculotherapy, Capsaicin Cream, biofeedback, exercise, laser treatment and placebo therapy. Unfortunately, although some of the treatment modalities are being standard, there is no single treatment that is effective for all sufferers, therefore it is recommended that new methods of treatment should be studied.

Radiofrequency thermal rhizotomy RTR is a technique of controlled thermal ablation of nerve fibers in the trigeminal ganglion or nerve route, producing loss of pain with relative preservation of touch and more complex facial sensations. Percutaneous radiofrequency thermocoagulation of the gasserian ganglion involves using a high-frequency current to precisely heat tissue, so that A-delta and C-fiber nociceptors are preferentially destroyed. Under fluoroscopic guidance, an insulated needle is passed through the foramen ovale next to the gasserian ganglion, and the technique is then performed. Taha and coworkers, in 1995, concluded that percutaneous stereo-tactic radiofrequency rhizotomy is an effective and safe treatment for trigeminal neuralgia. Serivani et al also as well as Mathews and Scrivani evaluated the effectiveness of RTR for trigeminal neuralgia, after failure of pharmacological management and concluded that RTR can be a successful management for TN patients.

Auricular electrical stimulation (auriculotherapy), on the other hand, is a form of acupuncture that is proven clinically effective treatment modality utilized for the relief of chronic pain and the alleviation of substance abuse. The external ear has been shown to have a somatotopic organization in an inverted fetus pattern; where each part of the auricle corresponds to a specific part of the body. Detection of electrical conductance and tenderness palpation can reveal specific auricular reflex points which can be stimulated to alter pathological reflex patterns in the brain, in internal organs, and in different peripheral regions of the musculoskeletal body. Tsurumi University School of Dental Medicine in Japan evaluated the effect of meridian acupuncture treatment on TN concluding that meridian acupuncture treatment is useful and can be a therapeutic approach in the management of TN. In 1995 Costantini et al concluded that acupuncture is an elective treatment in all kinds of secondary trigeminal neuralgia, while in the idiopathic form its validity is conditioned by preceding medical treatments and by beginning of the disease.

This paper reports six cases of TN in which three had been treated by medication and RTR whereas the other three been treated with medication and auriculotherapy as an intermediate methods of treatment prior to resorting to invasive open surgery. Numerical rating scale (0-10) was used with all patients.

Case 1

A 43-year-old Saudi male had his first episode of right-sided facial pain in 1982 just after graduating from college. He described the pain as severe electric-like shock, with stabbing feeling under the mandibular right molar teeth with sensation of fainting and a desire of hitting anything until getting his balance back. The pain scale was maximum and verbally de-
scribed it as far more than 10. Pain affected both jaws in the right side of his face, stimulated by lightly touching the face or eating hot, spicy and sour food and increasing in cold weather. The intensity and frequency of pain attacks increased until it became every day and lasted for a few seconds. His personal and family life was affected significantly by his condition.

He received different types of medications such as analgesics and antibiotics. The patient had CT scan examination in 1983 and was diagnosed with a benign intracranial tumor. A decision for surgery to remove the tumor was made and performed in United States, after which the condition was significantly improved and the pain decreased to zero on numerical pain scale.

In 1984, another CT scan was obtained which revealed no pathological findings. Pharmacological medication was instituted immediately and aggressively with carbamezapine 200 mg three times a day and was gradually increased to 2400 mg per day. His pain became 3 on the numerical pain scale but with the same frequency of pain attacks. The patient continued to have this medication for several years but reported drowsiness, loss of concentration in his business meetings, loss of memory in his professional work and laziness.

In the year 2000 he reported back to Pain Clinic Military Hospital in Riyadh. Given the history, age, physical findings, normal CT, current medication and level of dysfunction, a right RTR therapy was considered as an appropriate option and discussed with the patient. This procedure was performed successfully and the patient was immediately pain free following the procedure. He stopped all medications, although he complained of numbness in both jaws at the right side, which was expected as a side effect of the procedure. The patient was extremely satisfied and remained pain free for three years without any medication. In late 2003, mild pain reappeared and he started, on his own, taking carbamezapine 200 mg three times daily until present time with a pain scale of three. He was advised to have RTR for a second time and the patient is willing to repeat it.

Case 2

A 55-year-old Saudi female reported pain in the right side of the face, started ten years earlier in 1993. It was stimulated with gargling in early morning. The patient could not determine if the pain was in the upper or lower jaw. At the beginning, the pain was mild, but gradually increased to a pain scale of 10, creating daily extremely uncomfortable paroxysmal attacks. She sought medical help and had several investigations at various clinics including dental clinic at which she was diagnosed to have trigeminal neuralgia.

Different types of analgesics were prescribed which slightly reduced the pain but the pain attacks continued. She sought different medical opinions. Two years later, carbamezapine 200 mg three times a day was prescribed which was increased to 400 mg three times a day. It did not relieve the pain significantly and she was feeling sleepy and drowsy which affected her normal daily activities.

In September 1997, she was advised to have a right RTR therapy. The patient was pain free and all her medications were stopped few days after the procedure. Although she had numbness in her right cheek as a result of the RTR therapy, which decreased by time, but it was well accepted by the patient.

On recall examination in 2003, the patient indicated being completely pain free till 2002. Later on slight sensation of pain started in the left side of her face again with a pain scale of one to two triggered by gargling.

Case 3

A 77-year-old Saudi male was admitted in Riyadh Military Hospital as a case of TN. The patient described his first pain attack, starting in 2000, as an electrical shock-like sensation at the right side of his face, affecting both his maxilla and mandible. He reported a pain scale often with several episode attacks occurring every one to three weeks.

He was treated with carbamezapine 400 mg three time per day and analgesic (Fevadol) resulting in mild pain relief for two years. In 2002, he had MRI investigation that showed no abnormality in the basal cistern and in the trigeminal nerve. Later on that year, he was referred to the pain clinic where he received his RTR therapy.

The patient was almost pain free there after with rare attacks reaching a pain scale of two to three
required taking analgesic and carbamezapine. He reported some numbness and itching sensation in his right cheek.

Case 4

In 1995, a 42-year-old female patient complained of her first attack of facial pain in the right side of the lower jaw. It started suddenly as severe electric shock-like pain radiating to her right ear and eye with several daily episodes lasting for few seconds. Pain scale was 10. The patient had several medical investigations including MRI, which relieved no pathological abnormality; she was diagnosed with trigeminal neuralgia.

Carbamezapine was prescribed, starting with a dose of 200 mg three times per day gradually increased to 800 mg then 1200 mg where the pain was decreased but did not diminish completely. The patient continued on medication for six years. In 2001, she stopped the medication for two months only to avoid side effects of dizziness. The pain reoccurred, and she resumed taking carbamezapine combined with analgesic. In 2002 the patient sought another type of treatment, which was traditional Chinese needle acupuncture.

In October 2003, she visited the College of Dentistry, King Saud University for consultation where she received her first auriculotherapy. She was still on medication and needle acupuncture. Her pain scale was 5 to 6 on numerical scale. Auriculotherapy was done once a week for both ears. During therapy, the pain initially increased but reduced later on the same day and remained as such for five days where it gradually increased demanding the patient to repeat the therapy again. Because of inconvenience, the patient was not fully satisfied with her treatment and started seeking other types of therapy.

Case 5

A forty-four year old Sudanese woman referred to the Oral Medicine Clinic at Collage of Dentistry, King Saud University and gave the following history: She was complaining of severe pain in the left side of the lower jaw. She indicated that the pain started four years earlier with a stabbing-like character occurring in episodes, each lasting from several seconds to five minutes without a specific stimulus. The pain scale was 10 on numerical pain scale.

She had several investigations including a CT scan, which revealed no abnormality. She was given carbamezapine 200 mg 3 times per day and was decreased gradually over 3 months to be 100 mg per day. The pain scale became 5. The patient continued on the treatment for about one year and then she stopped it and was taking Paracetamol 500 mg when needed. Three months later pain recurred and she resumed taking carbamezapine. She continued on for three years until she was seen at the oral medicine clinic in 1999.

She started receiving auriculotherapy and could reduce carbamezapine to 400 mg per day. The pain scale was described to be around 4 with the auriculotherapy treatment. This treatment was done once per week for both ears. The pain attacks usually returns on the fifth day after auriculotherapy was done. Later on, she started receiving auriculotherapy every two to four weeks, as the pain relief period was getting longer, she stopped the carbamezapine for five months but then started again as the pain recurred, but she was taking only 200 mg.

The patient complained of numbness on the left side of the lower lip during her first session of auriculotherapy that soon disappeared at the end of the appointment. No other side effects were observed with auriculotherapy. The patient is satisfied with this type of treatment.

Case 6

In 1987, a fifty-two year old Filipino female patient complained of her first attack of facial pain in the right side of the face after wearing new removable partial denture. It started as slight pain with several episodes each day lasting for few seconds. Pain intensified to become severe burning pain. She indicated that pain scale increased gradually to ten disturbing her daily activities.

In 1993, a neurologist placed her on neurobion (B1, B6 and B12) and carbamezapine 200 mg three times per day. The patient continued on these medications for ten years where pain was relieved reaching to a level to four on the numerical pain scale.

In 2003, she visited the Collage of Dentistry, King Saud University where she received her first
auriculotherapy combining it with neurobion and carbamezapine. The following week her pain scale was one on numerical pain scale and auriculotherapy was done once again. She stopped all medications and was pain free for more than three months. As a form of precaution before going on vacation, she requested having a third application of auriculotherapy. She did not report any other episode of pain. She was advised to come back again if pain reoccurred.

DISCUSSION

Dental professionals have unique background as a result of training in both medical and dental sciences. They have knowledge in the diagnosis and management of pain disorders in the oral, facial and head region. TN is one of these disorders that fall within the area of expertise of the dental and medical professionals. It is a neurological disorder that can be diagnosed by the dental professional, and pain management may be initiated and then referred to the medical pain specialist.

Proposed causes of TN include trauma, dental pathosis and suppuration, clinical and subclinical viral infections, demyelinating processes, neoplasms, vascular compressive lesions, and intrinsic brainstem pathway dysfunction. Microvascular compression at the trigeminal root entry zone is believed to be the cause of TN in the majority of patients. It is diagnosed through clinical findings and history of symptoms. The presence of a trigger zone is one of the most characteristic findings of TN, however, not all patients with TN have such a trigger zone.

The classic, "idiopathic", or "essential" TN has to be distinguished from the symptomatic, secondary TN. An intracranial lesion of the trigeminal nerve that is located distal to the root entry zone causes this rare neuralgia. Secondary TN is also present in about 2% to 4% of patients with multiple sclerosis. Intracranial tumors are detected in 2-14% of patients with TN in some studies.

The zone of management of TN is a broad area, starting simply by the use of medications, proceeding to surgical procedures, and further more falling into the field of alternative medical therapies such as acupuncture, chiropractic adjustment and self-hypnosis or meditation. Among all pharmacological agents used for this purpose, carbamezapine (Tegretol) shows the greatest effectiveness. However, a long-term use of carbamezapine at the onset of TN, is usually mandatory, but leading to intolerable adverse effects involving the CNS such as drowsiness, fatigue or extreme exhaustion, dizziness, nausea, and nystagmus. Problems with memory, vision, e.g., diplopia, and other mental activities may occur. Patients taking the medication may also develop liver dysfunction and, rarely, hematosupression.

Going on to the next stage of treatment, there are peripheral and central (percutaneous, open) surgical procedures for the treatment of TN. Percutaneous approaches to perform trigeminal gangliolysis are considered to have less risks and less costs than open surgical procedures. Of the current percutaneous procedures, RTR has not only become the most prevalent surgical treatment for TN worldwide but is also the most widely reported operation in the neurosurgical literature and has the best overall, long-term outcome data. The initial pain relief is equal to or better than other procedures, the recurrence rate is less, and the side effects and complications are less frequent and less morbid.

Potential complications include corneal keratitis and anesthesia dolorosa.

In the past several years, there has been a growth of interest in alternative medicine in the United States and other parts of the World. The term alternative medicine encompasses an enormously vast range of practices, from those that are conceptually similar to conventional Western medicine to entire systems that have evolved in other cultures. Among these practices is auriculotherapy. It is more commonly used in clinical setting for the relief of chronic rather than acute pain. In acute conditions a combination of auriculotherapy and other pain relieving management might yield higher levels of analgesia than to be used alone. Auriculotherapy can be used as an effective substitute for medication, thus helping the patient avoid the hazards of drug use.

Pain is, by definition, a sensory and emotional experience, the patient's self-report of the pain experience is considered the "Gold Standard" in pain research, and thus the validity of these self-report measures is assumed. Le Resche previously adopted this concept in 1997.
All six patients reported here had failed aggressive long-term trials of medical therapy. RTR was performed on three of these cases with a pain relief lasting for the full three years of follow up in patient No. 1, a six year follow up in patient No. 2 and a one year follow up in patient No. 3 by receiving only one procedure of RTR therapy and an immediate discontinuation of carbamezapine except in patient No. 3 who required continuing a lesser dose of carbamezapine and analgesic. A complication of some facial numbness was reported, yet accepted by the three patients presented in this paper. Their satisfaction with procedure was exhibited by their willingness to receive RTR again if needed.

On the other hand, the other three cases received frequent visits of auriculotherapy for the treatment of their TN reducing both dose and frequency of carbamezapine but not discontinuing it completely although pain scale was decreased significantly except in patient No. 6 who discontinued the medication because she was relieved of pain. No complications to auriculotherapy was reported except in patient No. 5 where she had temporary numbness in her lip in her first session of auriculotherapy that soon disappeared.

From the cases reported here, we may conclude that RTR is a successful long-term therapy and has a great deal of disruption of adverse effects of medications used in treatment of TN. Auriculotherapy, as an adjunctive treatment modality, provides temporary relief of pain, reduces side effects of medication, and is less invasive, inexpensive and with no known complications.

Pain is influenced by several factors including physical, emotional, previous experience and even cultured factors.

Further large scale clinical studies should be conducted to evaluate the success of different modalities of treating TN using a larger sample of subjects with a long-term period. It is hoped that further clinical trial utilizing collaboration among researchers, traditional and adjunctive medicine practitioners will further help the progress of this very interesting and rapidly growing fields.

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REFERENCES