



Original Article

Trigeminal Neuralgia: A 10-Year Retrospective Study

Authors

Dr Fahad Ahmad¹, Dr Palvi Gupta², Dr Jeevan Lata³

¹MDS, Registrar Surgeon, Department of Oral & Maxillofacial Surgery, Al-Jahra Specialty Dental Center & Hospital, Ministry Of Health, Kwt.

Ex-Resident, Punjab Govt. Dental College & Hospital, Amritsar, India

²MDS, Private Practice, ON.

³MDS, Professor & Head, Department of Oral & Maxillofacial surgery, Punjab Govt. Dental College & Hospital, Amritsar, India

Abstract

Objective: To analyze the average age, sex, side of involvement, most affected branch in trigeminal neuralgia and efficacy of various treatment modalities used in primary centers which are lack in advance neurosurgical facilities.

Method: Patient's record of our center was reviewed and data of trigeminal neuralgia patients was collected from January 2001 to December 2010.

Results: Total 484 patients of idiopathic trigeminal neuralgia were treated in 10 year period with slight female predominance (52.68%). Right side was involved in 60.95% patients. Most affected branch was inferior alveolar nerve (53.47%). Seasonal variation was also documented. Medicinal treatment, absolute alcohol nerve block and peripheral neurectomy were the treatment used and average pain relief period documented as 23.13 months, 18.40 months and 32.23 months respectively.

Conclusion: We concluded that gradual increase from medicinal to surgical intervention is the best approach to manage facial neuralgia. In primary centers peripheral neurectomies can be considered as the best treatment option which is minimal invasive, and done under LA with predictable results. Moreover it can be performed easily in elder, short life span as well as in unfit patients.

Keywords: Trigeminal Neuralgia; Peripheral neurectomy; Alcohol nerve block; Facial neuralgia.

Introduction

Trigeminal neuralgia (TN) has been described as among the most painful conditions known to mankind. It presents with sudden, severe, brief, stabbing recurrent pains in the distribution of one or more branches of the trigeminal nerve. It is also known as fothergill's disease & tic douloureux. Usually it is unilateral, bilateral involvement is very rare and in bilateral involvement individual

attacks are usually unilateral, with distinct episodes involving each side of the face at separate times.¹ TN can be divided into Primary or Classic or idiopathic type and Secondary or Symptomatic type. International Headache Society (Headache classification, 2004) described the classic TN as 'Paroxysmal attacks of pain, lasting for a fraction of a second to 2 minutes, affecting one or more divisions of the trigeminal

nerve'. There is presence of trigger zone along the distribution of trigeminal nerve mainly at corner of the mouth, alar, nasal and supraorbital region. These specific areas can be triggered by light touch or by eating, talking, washing of face, shaving, teeth brushing or even a cool breeze. The pain is so excruciating that patients refuse washing their faces, eating and teeth cleaning.^{2,3} The aim of this retrospective study to analyze average age and sex of patients presenting with trigeminal neuralgia, side of involvement, most affected branch of trigeminal nerve, and efficacy of various treatment modalities used in primary centers which are devoid of advance technology and neurosurgical facilities.

Material & Method

In this study we reviewed patient records of department of Oral & Maxillofacial surgery, Punjab Govt. Dental College & Hospital, Amritsar from January 2001 to December 2010. Approval for this retrospective study was duly taken from the institutional ethical committee and hospital. The diagnosis was based on a detailed history and clinical examination. The branch of nerve involved was identified according to the site of pain and confirmed with diagnostic block with 2% Lignocaine with adrenaline 1:200,000. Orthopantomograph (OPG) was taken for every patient to exclude any local pathology. All patients were investigated preoperatively with CT/MRI scanning. Patients with underlying CNS abnormalities or lesion were not included in the study. Only those patients who were diagnosed for primary TN were included in the study. The follow-up period covered by this study ranged from 2 to 8 years. We used three treatment modalities medicinal (Carbamazepine, Gabapentine), absolute alcohol nerve block and peripheral neurectomy. The factors analyzed were the sex affected, mean age of the patients, side of involvement, branch of nerve involved, efficacy of treatment used & average recurrence time in various treatment modalities.

Results

In the period of 10 year 484 patients were diagnosed with idiopathic TN. Among those 229 were male and 255 were female. Presenting age of patients ranged from 33year to 95year with average age of 58.75 year. Right side was involved in 295(60.95%) patients. Seasonal variations were also found, most of the patients reported in the month of March (spring) and September-October (fall). Inferior alveolar nerve (branch of V3) was the most affected nerve 53.47% (258 patients). Infraorbital (branch of V2) was the second most affected nerve 37.96%. Supraorbital nerve (branch of V1) was involved in 19 patients. Other nerve such as Lingual (16), Posterior superior alveolar (14), Long buccal (22), Mental (6), Auriculotemporal(02), Supratrochlear (01), Greater palatine (02)and zygomatico temporal (1) were also affected. 56 patients were diagnosed with the simultaneous involvement of two nerves; most common combination was inferior alveolar with long buccal nerve. 16 patients were affected with simultaneous involvement of three nerves. Greater palatine nerve was involved with infraorbital nerve (01) and Posterior superior alveolar nerve (01). 31 patients showed fresh involvement of other branches along with the previous one during follow up period. Initially all the patients were treated with carbamazepine (600-1200 mg). Average pain free time period was 23.13 months (03-80 months). Patients who were resistant or could not tolerate medicinal treatment treated with absolute alcohol nerve blocks and peripheral neurectomies. In the time period of ten year 293 absolute alcohol nerve blocks were performed in different nerves repeatedly. Average pain free period for first time was 18.40 months (03-41 months) and second time it was only 5.5 months. 168 peripheral neurectomies had been performed during this period. Unfortunately we lost follow up of 23 patients, in rest of the patients average pain free period was observed and it was 32.23 months (05-73 months).

Discussion

TN is the disorder which affects the largest cranial nerve and presents with severe, brief lancinating type of recurrent pain. It is relatively uncommon with an estimated incidence one case per 20,000 persons. In most of the literature, the mean age of onset of TN is considered around 50 years, but now cases of TN can be seen in younger patients also, especially in mixed type of TN.^{4,5} The pathogenesis of Classic TN remains doubtful in spite of extensive investigations. Many theories have been given for possible explanation of mechanisms. Compression of the trigeminal nerve by a vascular loop is favored by many authors and micro-vascular decompression has been proved to be an effective treatment of TN. However many questions regarding TN are still unanswered such as behavior and location of trigger points etc.^{6,7}

The characteristics of the patients in our retrospective study, such as sex, average age, commonly involved side, and affected division, were approximately similar with the other previous studies.⁸ In the present series patients were slightly female predominance (female to male ratio was 1.12:1), mainly right side was involved (right to left ratio was 1.56:1) and the inferior alveolar nerve was the most affected branch(53.47%). The mean age of onset was 58.75 years but the youngest patient in this series was 33 year and oldest one was 95 year old. Bilateral involvement was not found in the present series. Involvement of less affected branches of trigeminal nerve such as supraorbital, auriculotemporal, supratrochlear, greater palatine, and zygomaticotemporal nerve were also documented.

The treatment approach of trigeminal neuralgia varies author to author, but most of them agree that it should be increase gradually from conservative to invasive procedure, available options are:(a)Medicinal therapy (Anticonvulsants drug) (b) Alcohol injections, (c) Peripheral neurectomy, (d) Cryotherapy, (e) Radio frequency thermo coagulation (RFTC) (f) Open:

microvascular decompression, (g) Percutaneous: (1) radiofrequency rhizotomy, (2) Retrogasserian glycerol rhizotomy, (3) Balloon compression of trigeminal nerve,(4) Sterostatic radiosurgery-Gamma knife.⁹

In this series we used conservative and minimal invasive techniques such as peripheral neurectomy as our center is lack in advanced neurosurgical facilities like many other government institutions in India. Moreover most of our patients belong to low socioeconomic part of society; expensive neurosurgical treatment is a big economic burden for the patients.

Medicinal therapy is the initial treatment option for newly diagnosed patient of trigeminal neuralgia. Initial response to medicinal treatment with anticonvulsant drugs is well in 85% - 90% of patients. But long term results are not very promising in pain relief and tolerance.⁹There are several factors which limit long term results of medical therapy such as adverse effects of drugs, extensive pharmacologic interactions, a narrow therapeutic window of tolerability and higher doses may be needed with time to maintain efficacy. Side effects of such drugs are drowsiness, nausea, diplopia, ataxia, dizziness, transaminases elevation, hyponatremia and some serious but rare side effects like allergy, myelosuppression, hepatotoxicity, lymphadenopathy, and Systemic lupus erythematosus.¹⁰ In our series average time of drug response was observed 23.13 months.

Though absolute alcohol nerve block is an obsolete treatment modality for TN in higher centers and developed countries, in primary center it is still in use. In our series we performed 293 alcohol nerve block and observed pain free period, it ranged from 3 to 41 months with an average of 18.40 months. Alcohol block is also preferred for the nerves which need extensive surgery to approach for neurectomy such as posterior superior alveolar nerve. The exact mechanism of pain relief by alcohol block is unknown but one study suggested that high viscosity and poor miscibility of absolute alcohol in water probably

causes the instantaneous relief from pain.¹¹This modality is not a permanent solution of the disease like others, and having side effects as well. The most commonly encountered side effects are post-injection neuritis with persistent pain, hyperesthesia, paresthesia and rarely motor dysfunctions at the injection site. It also causes local edema, inflammation, necrosis and scarring.

Peripheral neurectomy is a very old treatment option for facial neuralgia. Many series of peripheral neurectomy have already been published in the literature. Grantham¹²(1952) described a series of 55 neurectomies on 55 patients with follow-up period of 6-months to 8 years and average pain relief period of 33.2 months was observed. Quinn¹³ in 1965 published a retrospective case series of 63 patients with 112 neurectomies with a follow-up period of 0–9 years. The pain free period of 24–32 months was reported by him. Khanna and Galinde¹⁴ performed 118 neurectomies with successful outcome in 75% patients in 1-5 year follow up in 1985. In the present series of 484 patients we performed 168 neurectomies and average pain relief period was 32.23 months which is comparable to previous studies. We did not face any major complication in any of patients but local surgical complications such as facial edema and bruising in the early postoperative period were noted. Antibiotics and anti-inflammatory therapy was prescribed post operatively. Major side effect of neurectomy and avulsion is loss of sensation in the distribution of the respected division of trigeminal nerve. Some author also reported dysesthesia after neurectomy but in our series no patient was found with this complication.^{15,16,17,18}

In conclusion, none available treatment can completely cure the facial neuralgia. Though neurosurgical procedures have been proved to be effective treatment option and provide a ray of hope for future advancement yet availability of these procedures is limited. Especially in developing countries like India, many primary and rural centers are lacking in advance neurosurgical

technologies and experts. As most of the populations of our country still live in villages, a great number of patients belong to those areas. Advance centers are situated in big cities which are very expensive and out of reach for such rural populations. So medicinal and minimal invasive procedure like absolute alcohol nerve blocks and peripheral neurectomy though outdated but can be considered as preferred option for these centers.^{2,19} Every treatment option has its pros and cons. Medical therapy is first line of treatment but with side effects and with time get resistant. Absolute alcohol block needs minimal expertise, provide adequate pain relief period but less predictable and efficiency decreases with successive block in the same site. Peripheral neurectomies are minimal invasive procedure which are well tolerated by the patients and can be performed under local anesthesia. It is more economical, less morbid, and can be performed in patients with extreme of ages, debility or significant systemic diseases with short life expectancy. Moreover, this procedure is more cost effective and easily affordable by patients of low socioeconomic class. Although it causes numbness at the site of nerve distribution, with many other advantages it can be considered as acceptable treatment option for relief of stabbing pain of TN.

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Conflicts of Interest - None

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