



REVIEW ARTICLE

A RETROSPECTIVE STUDY ON PERIPHERAL NEURECTOMY FOR IDIOPATHIC TRIGEMINAL NEURALGIA

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ABSTRACT

Aim: To evaluate the data of the patients of idiopathic trigeminal neuralgia, treated with peripheral neurectomy, to evaluate the results obtained by this procedure and their recurrences.

Materials and Methods: We studied 40 Patients reporting to our hospitals with persistent pain after conservative treatment or intolerance to carbamazepine therapy were selected for neurectomy. The branch of nerve involved was identified according to the site of pain and confirmed with diagnostic block with 2% Lignocaine. The follow-up period ranged from 1 to 4 years.

Results: The mean age of the patient was 57.1 years (range 35–71 years) more were males (M:F = 1.73:1). Surgical treatment was peripheral neurectomy of the involved branch following failure of carbamazepine therapy. Follow up over 4 years revealed only two cases (6.66%) of recurrence.

Conclusion: Peripheral neurectomy is one of the oldest and minimal invasive forms of surgery, effective method of pain control well tolerated by the patient and can be done under local anesthesia.

INTRODUCTION

Trigeminal neuralgia is as a chronic, debilitating condition resulting in brief and intense episodes of facial pain in the distribution of one or more branches of the fifth cranial nerve (Serivani, 2005; Cerovic, 2009 and Ginwala, 1961). Trigeminal nerve has three major branches, the ophthalmic nerve (V1), the maxillary nerve (V2), and mandibular nerve (V3). Disease involving the nerve cause intense shooting pain along its distribution. After all conservative treatment modalities have been exhausted; various surgical methods may be advocated for the treatment of trigeminal neuralgia (Serivani, 2005; Cerovic, 2009; Ginwala, 1961 and Agrawal, 2011).

MATERIALS AND METHODS

Unfortunately, there is no definitive cure for trigeminal neuralgia at present. Relapses and reoccurrences may occur with significant morbidity, however plethora of medical and surgical treatment options do exist to alleviate the patient's symptoms. We reviewed a series of 40 patients who underwent peripheral neurectomy carried out in the maxillofacial unit of our hospitals (Table 2). The diagnosis was based on a detailed history, clinical examination and control of pain by Tab Carbamazepine. The branch of nerve involved was identified according to the site of pain and confirmed with diagnostic block with 2% Lignocaine (Table 2).

The follow-up period covered by this study ranged from 1 to 4 years. The factors analyzed were the demographic details of the patients, side of involvement, branch of nerve involved and procedure used postoperative complications, prognosis. The selection criteria for neurectomy was persistent pain after conservative treatment and intolerance of carbamazepine therapy, side effects of the drugs like nausea, drowsiness, fatigue etc.

The technique of peripheral neurectomy is:

- Access to the infraorbital nerve was through intra oral approach, with upper vestibular incision infra orbital foramen was visualized & infra orbital nerve and its peripheral branches were identified & avulsion of the nerve (Fig.1-3)
- Inferior alveolar nerve was approached intra orally by Dr Ginwala's incision (Das, 2001) and the nerve was identified, avulsed from the distal end. Vestibular incision in premolar region was taken; the mental nerve was identified & avulsed from the mental foramen and from the soft tissues (Fig.3-6).

The outcome/complications after neurectomy were assessed in terms of recurrences of pain, need for any other procedure to overcome pain, were graded as; (a). Good when there was no recurrence of pain. (b). Fair when there was recurrence of pain after certain period of time. (c). Poor when there was no improvement in pain episodes even after neurectomy.



Fig.1.Right Infraorbital nerve dissected and exposed with vestibular incision



Fig. 2. Avulsed branches of right infraorbital nerve



Fig. 3. Right infraorbital foramen blocked with bone wax



Fig. 4. Left mental nerve dissected and exposed with vestibular incision



Fig. 5. Avulsed branches of left mental nerve



Fig. 6. left mental foramen blocked with bone wax

RESULTS

In this study 40 patients underwent neurectomies of which 25 were males & 15 were females whose average age was 57.1 years with a range 48–70 years (Table 1). The third division (inferior alveolar) was most commonly affected by the disease, in 30 patients (75%) (Table 2). The second division (infra orbital) was afflicted in 8 patients (25%). None of the patients had lingual nerve involvement. The mean followup period was in range 1–4 years. Only 2 patients (5%) had recurrence of pain after a period of 1 year, they were prescribed Tab Carbamazepine 200 mg 12 hourly and were relieved of symptoms.

Table 1. Characteristic of 40 patients treated for trigeminal neuralgia

Sl. No	Age	Sex	Nerve Involved	Follow-Up (Years)	Result
1	61	M	Infraorbital	4	Fair
2	54	M	Inferior alveolar	4	Good
3	69	F	Inferior alveolar	4	Good
4	67	M	Inferior alveolar	3	Good
5	47	M	Supraorbital	2	Good
6	66	F	Inferior alveolar	4	Good
7	70	M	Inferior alveolar	1	Good
8	52	M	Infraorbital	4	Good
9	48	F	Inferior alveolar	4	Good
10	65	M	Inferior alveolar	2	Good
11	53	M	Inferior alveolar	4	Good
12	65	M	Inferior alveolar	3	Good
13	59	F	Inferior alveolar	4	Good
14	56	M	Inferior alveolar	3	Good
15	70	F	Inferior alveolar	4	Good
16	61	M	Infraorbital	4	Fair
17	54	F	Inferior alveolar	4	Good
18	69	M	Inferior alveolar	3	Good
19	67	M	Inferior alveolar	2	Good
20	47	F	Supraorbital	4	Good
21	66	M	Inferior alveolar	1	Good
22	70	M	Inferior alveolar	4	Good
23	52	F	Infraorbital	4	Good
24	48	M	Inferior alveolar	2	Good
25	65	M	Inferior alveolar	4	Good
26	53	F	Inferior alveolar	3	Good
27	65	F	Inferior alveolar	4	Good
28	59	M	Inferior alveolar	3	Good
29	56	F	Inferior alveolar	4	Good
30	69	M	Inferior alveolar	4	Good
31	61	F	Infraorbital	4	Fair
32	54	F	Inferior alveolar	3	Good
33	69	M	Inferior alveolar	2	Good
34	67	M	Inferior alveolar	4	Good
35	47	F	Supraorbital	1	Good
36	66	M	Inferior alveolar	4	Good
37	70	M	Inferior alveolar	4	Good
38	52	M	Infraorbital	2	Good
39	48	F	Inferior alveolar	4	Good
40	65	M	Inferior alveolar	3	Good

Table 2. Branches of Trigeminal Neuralgia involved

S.No.	Branch Of Trigeminal Nerve Involved	Total	Percentage
1	Inferior alveolar nerve	30	75
2.	Infra orbital nerve	8	20
3.	Supra orbital nerve	2	5

DISCUSSION

Trigeminal neuralgia is a clinical syndrome characterized by brief paroxysms of unilateral lancinating pain that is triggered by cutaneous stimuli, such as wind on the face, talking, chewing or brushing of teeth (Liu, 2004). Many of those who are affected experience multiple attacks daily and though, free of pain during attacks (Loh, 1998). Younger age has been found to be associated with symptomatic trigeminal neuralgia. Any treatment of idiopathic neuralgia is successful as long as it eliminates the pain (Chole, 2007 and Taylor, 1981). The approach to the treatment of trigeminal neuralgia varies greatly, but it should be gradual, from pharmacological therapy to very invasive, intracranial procedures (Ginwala, 1961; Agrawal, 2011). Unfortunately, there is no definitive cure for trigeminal neuralgia at present. Carbamazepine has become the treatment of choice in trigeminal neuralgia. However, experience shows 20-30% of patients require alternative treatment through failure of response or intolerance. For them, a variety of procedures to modify or interrupt afferent impulses

along the trigeminal pathway have been devised. Carbamazepine is the most studied and remains the drug of choice for treating trigeminal neuralgia (Chole, 2007). Currently available surgical options are (1) *Non-invasive technique*: (a) peripheral neurectomy, (b) Alcohol injections, (c) Cryotherapy, (d) Selective radio frequency thermocoagulation (2) *Invasive technique*: (i) Open: microvascular decompression, (ii) Percutaneous: (a) radiofrequency rhizotomy, (b) Retrogasserian glycerol rhizotomy, (c) Balloon compression of trigeminal nerve, (d) Stereotactic radiosurgery—Gamma knife (Loh, 1998).

The persistence of pain after pharmacological and injection (alcohol) therapies requires surgical intervention, these are the neurectomy of peripheral divisions of the trigeminal nerve and various neurosurgical procedures (Taylor, 1981 ; Nurmikko, 2001; Toda, 2008 and Prasad, 2009). Neurectomy of the peripheral branches of the trigeminal nerve is the simplest, safest and minimally invasive surgical method as experienced by the author. Most of the studies done for neurectomy were published many years ago (Grantham, 1952; Khanna, 1982 and Quinn, 1965). Quinn (Quinn, 1965), reported a retrospective case series of 63 patients with 112 neurectomies. A follow-up period of 0–9 years was noted, and the pain relief period of 24–32 months was reported. Grantham (Grantham, 1952), also reported on 55 patients who had 55 neurectomies, follow-up was for 6-months to 8 years. Average pain relief period was 33.2 months. Surgical access to the infraorbital (V2) & inferior alveolar nerve is intra orally. We consider this access to be better, primarily due to avoidance of post operative facial scars. Some authors use trans-facial access to the V2 division (Brito, 1999; Hassan Salama, 2009), most probably because of lower risk of the post operative wound and reduced post operative edema. Several authors discuss the number of repeated neurectomy of peripheral divisions of the trigeminal nerve (Cerovic, 2009). In this study of 4 year followup there were 2 cases of recurrence after a period of 2 year. Some authors state that the response of their patients to Tab Carbamazepine when the recurrence of pain appears is better after neurectomy (Loh, 1998), and lower doses of the medication are needed (Cerovic, 2009).

Conclusion

Trigeminal neuralgia is the most common cause of neuralgic pain in the facial region. Accurate diagnosis followed by low-dose carbamazepine is the first line of treatment. Surgery is reserved for patients refractory to the drug or adverse effects sufficient to mandate cessation. It is one of the oldest, minimal invasive forms of surgery more cost effective. This procedure is still acceptable, mainly indicated in patients with extremes of age.

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