

# Peripheral neurectomy in management of trigeminal neuralgia nursing essay



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Trigeminal neuralgia is the disorder of fifth cranial nerve with unknown etiology. Due to its unknown etiology its treatment is controversial. Various treatment options are available. Every treatment has its own advantages and disadvantages depending on the age of the patients.

Objective: The purpose of this study was to compare the post-operative pain relief/recurrence after cryosurgery and peripheral neurectomy in the treatment of trigeminal neuralgia.

Study design: quasi-experimental

## **METHODOLOGY :**

The study was carried out on sixty patients of Trigeminal neuralgia. The duration of study was from April 2006 to June 2011. They were divided into two groups. Thirty patients were treated by cryosurgery and 30 patients with peripheral neurectomy. They were assessed for post-operative pain after the procedures at different follow-up time, for ten months.

Results: Patients treated by either procedure (cryosurgery, peripheral neurectomy) showed mild difference in postoperative pain relief i. e. 76. 6% in cryosurgery and 60% for neurectomy after ten months of the procedures.

## **Conclusion:**

Based on this study, both procedures (cryosurgery and peripheral neurectomy) are about equally effective in short-term relief of pain (2-10 months) in patients with trigeminal neuralgia.

**Key words:**

Trigeminal neuralgia, cryosurgery, peripheral neurectomy, post-operative pain

**INTRODUCTION**

Trigeminal neuralgia (TN) is one of the most painful situation and is basically disorder of fifth cranial nerve. 1 It is a painful unilateral burden of the face, characterized by short electric shock like pain in the distribution of the TN. The cause is unknown but may be due to structural lesions<sup>2</sup>. The contact of vessels with trigeminal root has been confirmed by magnetic resonance imaging (MRI) studies and further supported by separating the vessel from the nerve root with immediate pain relief. 3, 4, 5

None of the many presented theories fully enlighten all recognized characteristics of TGN pain<sup>6, 7, 8</sup>the bulk of current evidence points to the TN rather than the CNS as the site of generation of TN pain. 9

The diagnosis of cranio-facial pain is frequently not easy due to similarity in symptoms between disease processes, and the number and range of classification schemes<sup>10, 11, 12</sup>. Since there is no laboratory test to verify the diagnosis , and obvious diagnostic criteria are necessary for clinical research and communication.

TN is treated by medical and surgical therapies. Medical management by pharmacological approach, while surgical management includes numerous peripheral and intracranial approaches. The medical therapy is usually 1st line of treatment <sup>13</sup>, with drugs such as carbamezapine<sup>14</sup>, baclofen,

gabapentin, phenytoin or clonazepam in single or combination regimens. 15 If medications are ineffective or not tolerated, surgical treatment options can be offered. Every surgical procedure carries its potential benefits as well as risks of

complications or long-term side effects. Thus, one must choose the type of surgical procedure carefully, with a complete understanding of all possible outcomes. 16

The purpose of surgery is to either damage or destroy the path of trigeminal nerve. Surgery for TN is either destructive (ablative) or non-destructive . Surgeries at the level of the Gasserian ganglion are all destructive and include radiofrequency thermo-coagulation (RFT), balloon compression (BC) and per-cutaneous glycerol rhizolysis (PGR). Other procedures include micro-vascular decompression (MVD), neurectomy, Cryotherapy, and alcohol or phenol injections. 16., 17

All these procedures are linked with variable success rate and failure<sup>17</sup>.

Peripheral neurectomy is a effective and easy procedure of pain control in TN . Neurectomies of the affected branches were attempted for the first time in 18th century with variable success. The procedure is reserved for elders, above 60 years of age. 18. 19 Early recurrence of pain does occur. Even recurrence within a month after this procedure has been noted. 20

Cryotherapy is a surgical technique in which a peripheral branch is uncovered and frozen at temperature from -50 to -700 C by application of a cryoprobe. The procedure is not stressful and can be repeated easily. 21

Following cryosurgery, the sensation remains intact. The majority of patients need to continue their previous medications after cryosurgery.

The purpose of this study is to compare the post-operative pain of two procedures after cryosurgery and peripheral neurectomy, consequently contributing towards the greater goals of a better treatment option and in due process benefit the concerned patients.

## **DATA COLLECTION**

The cases were selected from OPD of oral/maxillofacial surgery department Mayo hospital Lahore from 1st April 2006 to 30th July 2009, Jinnah Postgraduate Medical Centre Karachi from 1st August 2009 to 30th January 2011, and Liaquat university of Medical and Health Science Jamshoro from 1st February 2010 to 5th June 2011 after taking written approval from Medical ethical board of the concerned hospitals. Inclusion criteria were the patient of Age 40 years to 80 years, irrespective of sex, when medication become ineffective and Trigeminal neuralgia involved mandibular and maxillary branches of trigeminal nerve. The Exclusion criteria were Trigeminal neuralgia with secondary causes (tumors, multiple sclerosis) and Patients having other neuralgia in association with trigeminal neuralgia. An informed consent was obtained. The demographic information like name, age, gender and address was obtained. The type of treatment, which was undertaken, was according to medical ethics, beneficial and non-harmful to the patients. The confounding variables like age, sex, and history of pain were controlled by matching. 2% of lidocaine was injected around the nerve branch to localize the nerve branch involved with trigeminal neuralgia.

Investigations include routine investigations and radiographs like OPG and P-A face were done pre-operatively. Radiographic imaging was carried out to exclude local pathology.

30 patients were included in each group, Group A and Group B.

In Group A, patients were treated by Cryosurgery, and in Group B, patients were treated by peripheral neurectomy. Before intervention, patient's record was entered on the proforma (Annexure I). Postoperative pain relief/recurrence was assessed by history and VAS. Follow up was undertaken monthly for first four months and then at 10 month after the procedure. The success rate of the procedure was categorized into, excellent, good and poor according to pain relief and use of carbamazepine

The collected data was entered into SPSS version 10 and analyzed through it. Descriptive statistics were calculated. Variables analyzed included demographics (age, sex), history of pain and duration. The age was presented as mean $\pm$ SD.

The outcome measure of two procedures was presented independently with regard to pain relief/recurrence. The two groups then were compared for assessing relative success rate.

The success rate (post-operative pain relief/recurrence) of two procedures was measured by applying chi-square test as the data was qualitative with  $p \leq 0.005$  was taken as significant

## RESULTS

A total number of 60 patients of TN reported during study period . Post-operative pain relief/recurrence was followed monthly for first four months and then for ten months in both groups after the procedure.

The age of patients ranges from 40 years to 80 years. 5th decade and 6th decade of age was common presentation.

Male patients were 23(38. 3%) and female patients were 37(61. 7%). TN was common in female patients. Female to male ratio was 1. 6: 1. The sex distribution is shown in table no 2.

The branch involved with TN was confirmed preoperatively by injecting 2% lidocaine around the nerve branch. Mental nerve was involved in 27 (45%). Infraorbital nerve was involved in 22(36. 7%) and inferior alveolar nerve was involved in 11(18. 3%) patients. Thus mandibular branch is involved in 63. 3% cases and maxillary branch is involved in 36. 7% cases.

30 patients were allocated into Group A, undergone through cryosurgery and 30 patients for peripheral neurectomy. Post-operative pain relief/recurrence of the two procedures was noted as below. The procedure performed is shown in table no I.

The overall post-operative pain relief is comparable for both cryosurgery and peripheral neurectomy. Among patients treated with cryosurgery 23(76. 66%) patients were declared having excellent pain relief, 06(20%) patients had poor results and 01(3. 33%) had good results. Among patients treated with neurectomy, 18(60%) patients were declared having excellent results,

10(33. 33%) patients had poor results and 2(6. 66%) patients had good results. The p value for these two procedures after the ten months is not significant ( $p= 0. 378$ ). The follow up for individual procedure is shown in table no II and III. The final assessment is shown in table no IV.

### Final assessment<sup>33</sup>

The results of the treatment were classified into three groups as excellent, good, and poor pain

relief, based on the relief/recurrence of pain and the use of medicine (CBZ).

Excellent: Complete relief of pain with modest (200-400mg) use of carbamazepine

Good: Complete relief of pain with high dose (400-1200mg) of CBZ

Poor: Complete recurrence of pain despite high dose of CBZ.

## **Table No. I: Type of procedure performed**

**(n-60)**

Procedure

No of patients

Percentage (%)

Cryosurgery

30



50. 0

Peripheral neurectomy

30

50. 0

Total

60

100. 0

## **Table No. 2: Post-operative pain (cryosurgery)-follow up**

**(n-30)**

Months

Pain relief (excellent)

Pain relief

(Good)

Pain relief

(Poor)

Total no of patients

1st month

29

01

00

30

2nd month

29

01

00

30

3rd month

29

01

00

30

4th month

29

01

00

30

10th month

23

01

06

30

### **Table No. 3: Post-operative pain (neurectomy)-follow up**

**( n-30)**

Months

Pain relief (excellent)

Pain relief

(Good)

Pain relief

(Poor)

Total no of patients

1st month

30

00

00

30

2nd month

30

00

00

30

3rd month

24

02

04

30

4th month

24

02

04

30

10th month

18

02

10

30

### **Table No. 4: Final assessment (after 10 month)**

#### **Results**

#### **Neurectomy**

#### **Cryosurgery**

n=30

%age

n=30

Excellent

18

60%

23

Good

02

6. 66%

01

Poor

10

33. 33%

06

Chi-square= 1. 943

Degree of freedom= 02

$p= 0. 378$  (not significant)

## **DISCUSSION**

TN is a uncommon form of neuropathic facial pain characterized by severe, paroxysmal pain in the face. Management with anti-epileptic drugs or surgical procedures carries risks of side effects, recurrence and complications. Surgical procedures for TN can be availed when the pain is not relieved after multiple anticonvulsion medications, or when pain subsides but the patient requires medication dosing at levels that result in significant drug toxicity.

As with other studies, our study had the same limitations like limited Sample size; consequently it do not answer all questions concerning treatment of

trigeminal neuralgia. However, we have tried to provide some valuable information about different treatment options.

The exact cause and pathology of the TN is still controversial. No point is saved in the trigeminal pathway in which a lesion has not been described. Mechanical factors like tentorial ossification<sup>22</sup>, vascular compression by the superior cerebellar<sup>23</sup>, anterior inferior cerebellar and basilar artery and AV-malformation of the cerebellopontine angle are considered as possible causes. Ischaemic factors, infection of the teeth<sup>24</sup>, viral disease<sup>25</sup>, hypertrophic neuropathy<sup>26</sup>, malaria, drug toxicity and even music have been implicated in the etiology of the disease<sup>27</sup>. Just as numerous etiological factors are considered as probable causes, so are the different treatment modalities. Surgical treatment on the other hand is controversial subject among neurosurgeon and maxillofacial surgeons.

TN is not life threatening (Rothman and Monson, 1973), and hence a decision for surgery is not a matter of life or death in the usual sense.

The exact origin of TN remains subtle, the distinctive nature of the symptoms and provocative events of this disease have led to the development of numerous treatment options over the years.

Almost any procedure for the treatment of TN is associated with a certain incidence of pain recurrence, side effects, or complications. Even drug treatment, especially a course of carbamazepine, results in decreased alertness, psychomotor retardation, bone marrow depression, and ataxia in many elderly patients. Percutaneous radio-frequency retrogasserian

rhizotomy has not been performed for long time. Middle and posterior fossae  
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approaches are still the matter of discussion. In injection therapy, uncontrolled spread of alcohol or phenol is the main drawback. MVD is an adequate and effective long-term surgical treatment but again morbidity and mortality is higher compared to other procedures. Also TN of long duration and perhaps irreversible central changes in trigeminal system may result in failures. Although radiofrequency is generally safe and simple, it has notable incidence of unpleasant dysesthesia on the face. Peripheral neurectomy is simple and easy to perform but early recurrence and neuromas formation is the main drawback. Cryosurgery is safe, easy to perform and least possibility of neuromas formation. Our own preference for the initial treatment of drug-resistant trigeminal neuralgia is either peripheral neurectomy or cryosurgery. As the TN involves the elders so our choice is because the elders are usually debilitated, medically compromised, language problems or cognitive dysfunctions or those who elect these procedures after a thorough discussion of different treatment options.

Patients with trigeminal neuralgia in our study were treated by cryosurgery and peripheral neurectomy. Post-operative pain relief/recurrence was followed for ten months at interval of one month for first four months and then at ten month. On every visit patients were assessed for pain relief/recurrence. The presence and severity of the pain was assessed by using VAS (visual analogue scale)

Our study is comparable to other studies in term of pain relief.



Grantham<sup>27</sup> in 1952 reported a case series of 55 patients with 55 neurectomies. A follow-up of 6 months to 8 years was noted, and an average pain relief period of 33.2 months was achieved.

Quinn<sup>28</sup> reported a retrospective case series of 63 patients with 112 neurectomies. A follow-up period of 0-9 years was noted, and a pain relief period of 24-32 months was reported. Grantham and Quinn studies show excellent results regarding relief of pain after the neurectomy. Their studies are of longer duration compared to our study which is of ten months follow up. Also in their study they included the patients with recurrence after the procedure and re-treated by the same procedure.

Khanna and Galinde<sup>29</sup> described a successful outcome at 1-5 yr follow-up in 75% of 115 patients who underwent several Neurectomies. Mason<sup>30</sup> achieved a success rate of 64% at 12 months and 26% at 4 yr. Murali R et al<sup>31</sup> in their study on 40 patients, treated with Neurectomies at a follow-up of 24 months, only six (15%) had experienced recurrence; these were treated successfully by repeating the neurectomies. Oturai AB et al<sup>32</sup> compared alcohol block, neurectomy and radiofrequency coagulation for the treatment of TN. They found that, during a mean follow-up of 7 yr, 78% of patients who had undergone neurectomy experienced a recurrence. Their studies showed unfavorable results for neurectomy compared to radiofrequency lesioning. The study by Oturai AB et al showed high recurrence of pain compared to our study. This is because they have undergone single neurectomy and having follow-up of seven years, which is far longer compared to our study. Also it is worth mentioning here that nerve regeneration is the disadvantage of neurectomy, so the excellent results are <https://assignbuster.com/peripheral-neurectomy-in-management-of-trigeminal-neuralgia-nursing-essay/>

expected for few months to 02 years, after that if it recurs re-neurectomy should be done by reexploring the branch involved with TN.

Warrach RA et al<sup>33</sup> in their studies of 90 patients, of whom 44 underwent neurectomy showed, 12 (27. 03%) patients had excellent results (relief of pain with complete loss of sensation), 8 (18. 02%) had good results (recurrence of pain without loss of sensation) and 24 (54. 04%) had poor results (complete recurrence of pain with complete sensation loss). In this study the follow-up period of patients treated by neurectomy for TN was three years in contrast to our study, which is just ten months. So again showing that neurectomy is indicated for short-term period of pain relief.

Cryosurgery is the method of freezing the nerve to relief the pain. Various studies been done after it was first introduced in 1976 for the treatment of trigeminal neuralgia.

In 1976, Lloyd JW et al in their study have sixty-four patients with intractable pain were treated with cryoanalgesia. They have obtained pain relief on average of 08 months (224 days) in 52 patients (81%). Their study showed better pain relief, although of short duration and is similar to our study. Our study has excellent pain relief in 23 patients out of 30 patients, after ten months of follow-up after the procedure.

Barnard et al<sup>34</sup> in 1981 reported the use of cryotherapy in 24 patients with paroxysmal trigeminal neuralgia. Patients had a median relief period of 186 days but at the end of one year only 16% had full pain relief.

After follow-up of 1 month to 6 years, Zakrzewska and Nally<sup>35</sup> observed in 145 patients who had undergone cryotherapy a median time to recurrence of pain of 14 months for the infraorbital nerve and 9 months for the mental nerve. Zakrzewska reported again in a 10-year follow-up series of 145 patients and found a median pain relief period of 6 months and a mean time to recurrence of 10 months, as compared with the median pain relief period of 24 months in 265 patients treated with radiofrequency thermocoagulation<sup>36, 37</sup>. However, many patients continued to take carbamazepine after cryotherapy, although the doses were lower.

Warraich RA et al in their study, of 90 patients, of which 46 undergone cryosurgery. <sup>33</sup> They have observed excellent pain relief in 25 patients (54. 34%), 10(21. 73%) patients had good results, 5(10. 86%) had poor results and 6(13. 04%) patients did not turn for follow up. Their study period was three years, from 1991-1994. This study favors the results of our study, in which the excellent pain relief has been noted in 23(76. 66%) patients after 10 months of follow up.

There is no definite treatment of trigeminal neuralgia. Various treatments options are available, depending upon the age of the patients and the complications of the procedures.

In our study we utilized the cryosurgery and peripheral neurectomy to treat trigeminal neuralgia. We are concerned only to get relief of pain.

Our study is of short duration, of only ten months follow up. The relief of the pain in both these procedures was categorized into three groups. These were according to the pain relief after the procedure.

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All of the above studies showed that trigeminal neuralgia treated by peripheral neurectomy and cryosurgery provides relief of pain for shorter period of time. However, longer duration of pain relief has been achieved mentioned in various studies. In these studies they have repeated the procedures when the patient developed recurrence after the procedures. In our study we did not repeat the procedures. We observed the patients after the procedures for ten months and found that these two procedures are nearly equal in providing short-term pain relief.

## **CONCLUSION:**

Trigeminal neuralgia is treated by various surgical procedures, if the medical treatment fails or the patients cannot tolerate the pharmacological therapy. Among these procedures cryosurgery and peripheral neurectomy are minimal invasive with short-term pain control.

Both cryosurgery and peripheral neurectomy offer good therapeutic modalities by providing pain control for patients suffering from typical trigeminal neuralgia. The initial success rates are high with both procedures.

Both these procedures are easy to perform and useful in patients where other treatments have failed and the patients or doctors are reluctant to consider procedures aimed at the ganglion or root. Our study of comparison of cryosurgery and peripheral neurectomy aims to provide a painless face to the patients of trigeminal neuralgia. We believe that these two procedures should be the procedure of choice for patients with trigeminal neuralgia in elders, above 60 years of age.