

Peripheral Alcohol Block v/s Peripheral Neurectomy: A Comparative Clinical Study in the Treatment of Trigeminal Neuralgia

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Abstract

Aim : To investigate the efficacy of peripheral alcohol block and peripheral neurectomy in terms of various parameters during treatment of type I trigeminal neuralgia.

Materials and Methods: Two study groups of total 50 patients were selected from the outpatient department records of Oral & Maxillofacial Surgery of K.D.Dental College and Hospital. Group A included 25 patients, who underwent peripheral alcohol block and group B included 25 patients who underwent peripheral neurectomy. The paired samples t test was used for statistical analysis.

Results: Comfort level of patients and ease of operator while performing the procedure was more in group A than in group B. Although recurrence rate is earlier for group A patients as compared to group B, but peripheral alcohol block is an attractive procedure for elderly and debilitated patients.

Keywords: Trigeminal neuralgia, 92% alcohol injection, Peripheral alcohol block, Peripheral neurectomy

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I. Introduction

Trigeminal nerve is the largest of all the cranial nerves. It is a mixed cranial nerve and transmits sensory sensation to the face, oral and nasal cavities and most of the scalp and carries motor supply to the muscles of mastication.¹ Trigeminal neuralgia (TN) is defined as sudden, usually unilateral severe, stabbing, lancinating paroxysmal pain in distribution of one or more branches of trigeminal nerve. The first clear description of TN that was not confused with another disease entity was made in 1688 by Drs. Johannes Michael Fehr and Elias Schmidt.

TN is divided into two types—A) Type I or classical TN in which paroxysmal attacks, lasting for few secs to minutes. Type I is neither associated with any neurological defect nor attributed to other disorder. The commonest cause is vascular compression by tortuous vessel (mostly superior cerebellar artery).² B) Type II or symptomatic TN in which paroxysmal attacks, lasting for long periods and associated with either neurological defect or other attributed disorders. The commonest cause is any underlying pathological tumor (neurofibroma, schwannoma) or multiple sclerosis (generally bilateral clinical symptom). The aim of the study was to investigate the efficacy of peripheral alcohol block v/s peripheral neurectomy as a procedure in the treatment of type I trigeminal neuralgia.

II. Materials And Methods

A consecutive series of 50 patients who either underwent peripheral alcohol nerve block or peripheral neurectomy in the Maxillofacial unit of K.D.Dental College & Hospital from Oct 2015 to Oct 2017 were reviewed. The diagnosis was based on detailed history, clinical examination and control of pain on taking Carbamazepine, on an average 600–800 mg/day in divided doses for 2-3 years.

Inclusion Criteria:- A) age group 40-70 years B) refractory to medical therapy C) no patient in this series had previously undergone any type of surgical procedure for the problem D) preoperative CT Scan or MRI reveals no underlying structural abnormalities in relation to the problem.

Exclusion Criteria:- A) previously surgically treated patients B) medically compromised patients C) uncooperative patient

On the first visit, the branch of the nerve involved was identified according to the site of origin of pain and confirmed via a diagnostic local anesthetic injection of 2% lignocaine with adrenaline 1:100,000 at the site, repeated three times on consecutive days using self aspirating syringe, with lignospan special cartridge of 1.8 ml.

For Group A

Injection Technique For Peripheral Alcohol Block:

For the alcohol injection, 1–1.5 ml of absolute alcohol was used in a disposable syringe with a 26 Gauge needle (short or long depending on the anatomical site). The amount of alcohol injected was determined according to the nerve involved.

The protocol decided was 1 ml each for mental nerves; 1.5 ml each for infra-orbital and inferior alveolar nerves. Since the injection of absolute alcohol is painful, the nerve was anesthetized using 2% lignocaine with adrenaline before treatment.

Apart from pain relief, the point of entry of the local anesthetic injection provided a guideline for the exact and effective injection of absolute alcohol because of anatomical variation.

After the nerve had been anaesthetized, absolute alcohol was injected into the affected branch of the trigeminal nerve.

For infraorbital nerve an intra-oral approach was used. The infra-orbital foramen was located using the index finger of non-injecting hand placed at the infra-orbital rim and slid down to rest in a depression of the foramen, almost 5–7 mm below the rim at the junction of the medial one third and lateral two-third of the infraorbital rim. The index finger was kept there and absolute alcohol was injected.

For mental nerve, an intra-oral approach was preferred. The point of injection was selected between the occlusal plane of the mandibular teeth and the lower border of the mandible below the second premolar. The mental foramen was identified on OPG in relation to the apices of the first and second premolars.

For inferior alveolar nerve injection a traditional intraoral technique was used. The thumb of the non-injecting hand was placed in the deepest portion of the concavity of the ramus between the internal and external ridges of the mandible. The other four fingers were placed extra-orally on the posterior border of the ramus. With the barrel of the syringe lying over the premolars of the opposite side, the 26 G long needle was directed parallel to the occlusal plane of the mandibular teeth, bisecting the thumb, and was aimed at the midpoint of the ramus located between the thumb and the extra-orally placed fingers. The needle was advanced through the pterygomandibular raphe into the pterygomandibular space, 1.5 cm deep from the mucosa.

For Group B

Surgical Technique Used For Peripheral Neurectomy:

All the procedures were performed under local anaesthesia, 1hr before the procedure, intravenous antibiotics were given.

Access to the infraorbital nerve was through intra oral approach. After taking upper vestibular incision infra orbital foramen was visualized & infra orbital nerve and its peripheral branches were identified & resected at the foramen and dissected out from the soft tissues.

Access to the inferior alveolar nerve was approached intra-orally by Dr Ginwalla’s incision; the nerve was identified and avulsed from the distal end.

Access to the mental nerve was through intraoral approach. Vestibular incision in premolar region was taken; the mental nerve was identified and avulsed from the mental foramen by reeling on haemostat and from the soft tissues.

The techniques for lingual nerve, long buccal nerve, supraorbital and supra-trochlear nerves were not applied because none of these nerves were involved in the patients with TN.

Antibiotic therapy was maintained for five post-operative days in both groups.

All the patients were followed up for 2 years.

III. Result

Total of 32 females and 18 males took part in the study. Group A contained 17 females and 8 males and Group B contained 15 females and 10 males. In group A TN involved the right side in 16 patients and left side in 8 patients. In group B TN involved right side in 12 patients and left side in 13 patients.

Table No.1-Comparison Of Post Operative Pain

DAY	GROUP	MILD	MODERATE	SEVERE	ASYMPTOMATIC
1 st day	Gr. A	0	6	19	0
	Gr.B	0	2	23	0
DAY	GROUP	MILD	MODERATE	SEVERE	ASYMPTOMATIC
	Gr. A	12	8	5	0

3 rd day	Gr.B	2	5	18	0
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DAY	GROUP	MILD	MODERATE	SEVERE	ASYMPTOMATIC
7 th day	Gr. A	20	5	0	0
	Gr.B	12	11	2	0

DAY	GROUP	MILD	MODERATE	SEVERE	ASYMPTOMATIC
15 th day	Gr. A	6	0	0	19
	Gr.B	10	0	0	15

Table No.2-Comparison Of Post Operative Swelling

DAY	GROUP	MILD	MODERATE	SEVERE	NO SWELLING
1 st day (after 1hr of procedure)	Gr. A	17	8	0	0
	Gr.B	20	5	0	0

DAY	GROUP	MILD	MODERATE	SEVERE	NO SWELLING
3 rd day	Gr. A	6	15	4	0
	Gr.B	4	13	8	0

DAY	GROUP	MILD	MODERATE	SEVERE	NO SWELLING
7 th day	Gr. A	20	5	0	0
	Gr.B	12	13	0	0

DAY	GROUP	MILD	MODERATE	SEVERE	NO SWELLING
15 th day	Gr. A	1	0	0	24
	Gr.B	2	0	0	23

Table No.3-Comparison Of Patient's Acceptability

DAY	GROUP	GOOD	FAIR	POOR
1 st day	Gr. A	0	8	17
	Gr.B	0	4	21

DAY	GROUP	GOOD	FAIR	POOR
3 rd day	Gr. A	0	10	10
	Gr.B	0	5	20

DAY	GROUP	GOOD	FAIR	POOR
7 th day	Gr. A	0	16	4
	Gr.B	0	17	8

DAY	GROUP	GOOD	FAIR	POOR
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15 th day	Gr. A	15	8	2
	Gr.B	12	8	5

Table No.4-Comparison Of Recurrence Rate

GROUP	Within 6 Months	Within 6-12 Months	Within 12-18 Months	Within 18-24 Months
Gr. A	2	5	8	7
Gr.B	0	2	8	8

IV. Discussion

Almost any procedure for the treatment of trigeminal neuralgia is associated with a certain incidence of pain recurrence, side effects or complications.³ Treatment with medication, especially a course of carbamazepine, results in decreased alertness, psychomotor retardation, bone marrow depression and ataxia.⁴ Though MVD [Micro Vascular Decompression] remains the preferred treatment for TN but it can't be performed on all patients due to high surgical risks. Now a days more commonly, Gamma Knife Radio-Surgery is preferred as it is safe and can be done as day procedure.

Despite the availability of newer drugs for TN, many patients still require surgery because of pharmacological refractoriness or intolerance. According to the European Federation of Neurological Societies (EFNS) guidelines on neuropathic pain assessment and the American Academy of Neurology (AAN) guidelines, patients who are not benefited by the effective doses of carbamazepine or oxcarbazepine are the ideal candidates for surgical intervention.⁵ Prior to the procedure, all patients and their families were informed that peripheral neurectomy is usually associated with a certain degree of pain recurrence, consequent to nerve regeneration in approximately 18 months to 2 years. Only 2 patients in group B who underwent peripheral neurectomy showed recurrence within first year and 8 patients showed recurrence within 12-18 months. After 2 years follow up 22 patients of group A had shown recurrence whereas in group B 18 patients had shown recurrence. Despite less recurrence rate in peripheral neurectomy, alcohol nerve block is well tolerated by the patients and post-operative complications are comparatively less. Although alcohol injection is essentially a simple technique, the alcohol must be injected very precisely as it is highly toxic. Care must be taken not to inject excess alcohol subcutaneously, and one must use an aspiration technique to avoid injecting into the accompanying vessels.⁶

We have no quarrel with advanced approaches (MVD, Percutaneous Radiofrequency Rizotomy, Gamma Knife Radio-Surgery) for treatment of TN; however peripheral neurectomy and peripheral alcohol injection are most acceptable day care procedure for patients.

V. Conclusion

Peripheral neurectomy and peripheral alcohol (92%) nerve block both provide excellent pain relief without losing corneal sensation (in case infraorbital neuralgia). Though neurectomy provide a long term pain free intermittent duration but peripheral neurolysis with 92% alcohol is an attractive and safe procedure for elderly, debilitated and cognitively impaired patients.

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