

Laser-Assisted Mental Nerve Neurectomy

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ABSTRACT

A 66-year-old male was suffering from trigeminal neuralgia affecting the mental branch. The patient was posted for a peripheral neurectomy considering his age and history. The patient had already undergone a neurectomy 3 years before the present complain. Thus, it was decided that a diode laser should be used, so that the nerves can be ablated and the surgery is less painful and bloodless for the patient. Patient was put on observation following the laser neurectomy, so that the recurrence time between a conventional procedure and a laser neurectomy can be compared. The patient reported with recurrence within 4 months. A second surgery showed that the pain was more from collateral innervation than the main nerve regeneration. The cause for the early recurrence of pain is of clinical significance as lasers are known to enhance nerve regeneration.

Keywords: Laser peripheral neurectomy, Trigeminal neuralgia, Recurrent rate, Need for study.

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INTRODUCTION

Lasers have been used extensively for various surgical ablation procedures because of its comfort to the patient, less bleeding and excellent healing of the wound. Neurectomy is a very old procedure and trigeminal neuralgia is a protracted condition where the medical management has to be carried for an extended period of time. The pain often becomes intractable along with the side effects of the medication. Peripheral neurectomy is the preferred choice of treatment in elderly age group.

CASE REPORT

A 66-year-old male was presented at the dental clinic with recurrent excruciating pain in the left lower jaw that lasted for nearly a minute (Fig. 1A). A detailed history revealed that he has already been suffering for the past 5 years and was operated once 3 years back. The present pain had been steadily getting worse since the last 4 months.

On clinical examination it was found that the patient had undergone extractions of all the lower posterior teeth (Fig. 1B). The oral hygiene was poor because of the inability to brush in the mornings.

According to the site of the pain, the branch of nerve was identified as the mental branch of the trigeminal nerve



Figs 1A and B: Patient face in pain and intraorally all left lower teeth extracted and poor oral hygiene

with diagnostic local anesthetic of lignocaine 2% with adrenaline. The test block was given for two consecutive days at different time intervals and it was concluded that it was the mental branch that was affected. Since the patient had already tried medical management with carbamazepine and had received only little relief, it was decided that a laser neurectomy under local anesthesia should be performed. From the theoretical point of view, a laser thermal energy should coagulate the nerve endings and delay the reanastomosis of the nerve segments thereby minimizing the possibility of a neuroma formation and adhesion with surrounding soft tissues.

A diode of 940 nm laser was used to place the incision on the buccal side (Fig. 2) in the premolar region and the well regenerated bundle of nerve was visualized both at its point of emergence from the mental foramen and up to its insertion into the muscle on the buccal mucosa (Fig. 3).



Fig. 2: Diode laser incision



A



Fig. 3: Mental nerve emerging from mental foramen



B

Figs 4A and B: Diode laser ablation at the mental foramen orifice and the laser excised nerve tissue

The nerve was well avulsed from the mental foramen with the laser and was ablated deep in the foramen (Figs 4A and B). Laser was used to remove and ablate the nerve at the area of insertion into the muscle also. Laser access to the site provided good visibility to a bloodless field and the patient felt a lot more comfortable during the neurectomy. The wound was sutured and patient was asked to rinse his mouth with 3% hydrogen peroxide twice a day. He was administered amoxicillin 250 mg tid and metrogyl 400 mg tid for 5 days after the procedure. The patient had immediate relief and healing was excellent with no swelling.

The patient was reviewed after a week for suture removal and he was very comfortable. A monthly follow-up was carried out to see, if the use of laser could put off the recurrence better than a conventional neurectomy. The patient came back after 4 months with recurrence of pain and symptoms as before, though not as severe and frequent (Fig. 5). With the consent of the patient, the site of neurectomy was opened up again but there was no nerve emerging from the mental foramen (Figs 6A and B). The wound was sutured (Fig. 7) and patient was administered carbamazepine.



Fig 5: Intraoral, 4 months later

DISCUSSION

Peripheral neurectomy has a recurrent rate of 12% within 0 to 2 years whereas the recurrence rate of peripheral neurectomy is 70% within 2 to 5 years.^{1,2}

In this case, it was found that the neurectomy that was performed with a diode laser resulted in a faster recurrence



Figs 6A and B: Reexposure of the mental nerve site by conventional surgery shows no significant regeneration of the nerve bundle

than the conventional procedure. The cause is generally attributed to the fact that reanastomoses of collateral nerve fibers may have been enhanced by the laser energy and thus it is of clinical significance. In this case, the resurgery that was performed conventionally to check the nerve regeneration showed no proper nerve from the foramen. Thus, the case study discussed in this article suggested that further research is needed to study the behavior of the lasers with the nerve tissues, its regeneration and ablative capacity for treatment applications.



Fig. 7: Surgical wound suture

CONCLUSION

The following conclusions were drawn within the limits of this case report:

1. Laser-assisted surgery provides a bloodless field to work.
2. Laser ablation is pain-free and comfortable for the patient.
3. Laser does not effectively prolong the time of relapse in peripheral neurectomy.

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