

CASE REPORT***Management of pericoronitis using 940 nm diode laser***Dharitri Sharma¹, Dikshita Medhi², Ellora Madan³, Jharna Bharali⁴**Abstract:**

Pericoronitis is the inflammation of the soft tissue associated with the crown of a partially erupted tooth. Partially impacted teeth often present with pericoronitis leading to dilemma in diagnosis and treatment options, as to whether to extract or carry out operculectomy. Among the different surgical options available to remove the operculum, the goal is to develop a treatment option with the fewest complications for patients with pericoronitis among which laser is more suitable in selected conditions. A 22-years old patient reported to this institution with partially erupted tooth (#48, #38) having inflamed pericoronal tissue with partial trismus. Following palliative treatment for 5 days, operculectomy was performed on one side using diode laser. Uneventful healing was observed in 21 days.

Key Words: Pericoronitis, operculitis, operculectomy, diode laser.

Introduction

Pericoronitis refers to inflammation of the soft tissue in relation to the crown of an incompletely erupted tooth, including the gingiva and the dental follicle.¹ The word pericoronitis is derived from the Greek word, *peri* means "around", Latin word, *corona* means "crown" and *itis* means "inflammation." It is also known as operculitis.¹ Pericoronitis of the mandibular permanent third molar is typical^{2, 3}, but it can occur around the base of any tooth that has not erupted completely. Pericoronitis is mostly involved in 67% of vertical impacted cases, 12% of mesio-angular cases, 14% of disto-angular cases and 7% of various other positions. Bilateral pericoronitis is a rare condition. It may be suggestive of underlying infectious mononucleosis.¹

Apart from the plethora of obligate facultative anaerobic microflora such as the *Stomatococcus Mucilaginosus* and *Rothia dentocariosa*, *Actinomyces* and *Prevotella* species may also be present in such infection.⁷ Amongst acute oral Operculum is a flap of gingival tissue typically distal to a molar that remains as a sequelae of eruption.⁴ Maintenance of the oral hygiene particularly in the operculum area is very difficult to achieve by normal methods of oral hygiene.⁵ Pericoronitis propagates an ecological niche for a tremendous variety of polymicrobial flora, mainly consisting of anaerobic pyogenic bacteria.⁶ health problems of young adults, pericoronitis is found to be ranked as first or second.^{5, 8}

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The patient suffering from pericoronitis, even with no clinical signs or symptoms, often has the gingival flap chronically inflamed and infected and has varying degrees of ulceration along its inner surface.

Pericoronitis manifests itself in both acute and chronic state, the former often being characterized with periods of quiescence, which may or may not include episodic acute attacks.⁹ The acute condition may be exacerbated by various factors.¹⁰

Etiopathology of Pericoronitis

The most common cause behind pericoronal inflammation is the entrapment of plaque and food debris between crown of tooth and overlying gingival flap or operculum. Hence, the most ideal area for the growth of bacteria, moreover, it is difficult to clean. Constant chances of acute inflammation of pericoronal sites may be due to aggravating factors such as trauma, occlusion or entrapment of foreign body below the pericoronal flap.

The increase in the bulk of the pericoronal flap due to the release of inflammatory tissue fluid and cellular exudate may cause difficulty in complete closure of the jaw.^{10, 11} A systemic conditions such as influenza, upper respiratory tract infections or a period of stress may lead to compromised host immune system. So, acute pericoronitis can be considered as an opportunistic infection or may be an opportunistic exacerbation of a chronic process which is normally kept in check by a competent immune system. Hence it is associated with varying clinical features.

Clinical Features of Pericoronitis

1. In acute conditions, the operculum is usually red, swollen, tender and with suppuration.
2. The pain is severe throbbing in nature which is radiated to the ear, throat, floor of the mouth,

temporomandibular joint and posterior submandibular region.

3. The food impaction in the affected area can lead to periodontal pain and pulpitis (secondary to dental caries)
4. Dysphagia along with halitosis due to poor oral hygiene.
5. Swelling of the cheek in the region of the angle of the jaw along with trismus is evident.
6. Signs of trauma like the indentations of the opposing teeth along with ulcerations can be seen.
7. Systemic complications can occur such as fever, leukocytosis (increase in number of W.B.C.), malaise, regional lymphadenopathy and loss of appetite.
8. In severe cases, infection may extend in to the adjacent tissue spaces.

Depending on the severity of the inflammation, systemic complications and the advisability of retaining the involved tooth, different treatment modalities of operculectomy can be planned.

Operculectomy

It is the procedure by which the affected soft tissue covering and surrounding an unerupted or partially erupted tooth is surgically removed. This procedure helps in preventing plaque build-up along with reduction of inflammation in that area. It becomes easy for the patient to maintain the oral hygiene. Operculectomy accounted for about 65.4% and was carried out more on females than males.¹²

There are various procedures for operculectomy, like excision of operculum with laser, scalpel, electrocautery etc. Persistent symptom-free pericoronal flaps should also be removed as a preventive measure against subsequent acute involvement.

Case Report

A 22-years old male patient came to the Department of Periodontology in Kothiwal Dental College & Research Centre with a chief complaint of pain in the lower right and left back tooth region since last 3 days. The pain was dull, throbbing, continuous in nature and was radiating to the neck and the ear. Pain aggravates during intake of meals and relieves on taking medication but it reoccurs. The patient complained of food lodgement in the same region.



Figure 1: Pre-operative clinical view of #48 and #38 region respectively

Treatment procedure

The patient was advised antibiotics (Amoxicillin 500mg + Clavulanic acid 125mg) thrice a day, along with analgesics (Aceclofenac 100mg + Paracetamol 325mg) twice a day for 5 days. Scaling, root planning and irrigation (1 ml of 5% Betadine with 9 ml of saline) was done.

After 2 days, the patient was recalled for evaluation and reduction of the swelling was observed.

On the fifth day when the swelling and pain subsided completely, the area (# 48 region) was anaesthetized with 2% lignocaine of 1:100,000 adrenaline. After the affected area was anaesthetized, the operculum to be excised was assessed with the help of a periodontal probe. It was then excised with the help of the diode laser in the contact mode, continuous pattern with an intensity of 940 nm wavelength and 2.0 W power.(figure 2 & 3)



Figure 2: The operculum was removed with the help of the diode laser



Figure 3: The site after the removal of the operculum

After the operculum was removed the area was properly checked for any other etiology for the occurrence of it. As #48 had initial caries, it was scrapped off using a spoon excavator followed by restoration. The area was thoroughly irrigated with 5% betadine in concentrated form.

The patient was recalled for follow up on 7thday, 14thday and 1 month. (figure 4)



Figure 4: Post-operative clinical view after 7 days #48 and #38

The same procedure was repeated on the #38 region for the excision of the operculum.

Discussion

The term laser is an acronym for “Light Amplification by Stimulated Emission of Radiation.” A laser is a device consisting of solid, liquid, or gaseous substance which produces a light beam when stimulated by a source of energy. Maiman first introduced laser in 1960¹³ whereas, Goldman et al. introduced the first application of a laser to dental tissue in 1964.¹⁴ The tooth in the affected area was partially erupted and through the operculum its distal margin was felt clinically. While eating, food got accumulated and the patient was not able to clean the area properly.

There was bleeding in the region and the patient was not able to open the mouth properly during speech and eating when he reported. #48 had initial caries and #38 was non carious, both had a proper occlusion with the opposing teeth. There was adequate attached gingiva present distal to both #48 and #38. The prognosis was good and extraction was not suggested. The patient was also willing to retain the natural tooth and was seeking for the alternative treatment of extraction. Hence, the operculectomy procedure was selected. Operculectomy can be done by scalpel, laser or electrocautery.

The only disadvantage with scalpel is the excessive bleeding that takes place during the procedure.¹² Also the procedure was not done with electrocautery because it leads to more charring compared to laser. Several studies reported that laser has the ability to ablate hard tissues with minimal anaesthesia and provide coagulation of soft tissues.¹⁵ Also, laser has a strong power against bacteria thus encouraging decontamination and anti-inflammatory action.¹⁵ Hence, the procedure planned was done with the help of diode laser as its fiber provide better access, clean, and clear operating field¹⁵ with minimal charring at the surgical site. The results differ in different studies based on its duration of application, wavelength, intensity, and way of application in contact or non-contact mode. In this case, healing took around 21 days (delayed healing) along with post-operative pain which lasted for around 5 days, which is not commonly documented in literature.

Limitation

1. Delayed healing was experienced by the patient.
2. Post-operative pain was also experienced by the patient which lasted for a few days.

Conclusion

Though pericoronitis around third molar as a disease entity looks small but one cannot neglect its potential complications. Beside its local symptoms, this small inflammation can transform into localized abscess or can spread into adjacent soft tissue spaces leading to life threatening conditions if left untreated.¹ A proper diagnosis should be made on the basis of thorough case history, clinical examination and radiographic assessment. Among the different surgical options available to remove the operculum, the goal is to develop a treatment option with the fewest complications for patients with pericoronitis among which laser is more suitable in selected conditions.

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