

CASE REPORT

Minimally Invasive Management of Pericoronal Abscess using 810 nm GaAlAs Diode Laser

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ABSTRACT

Acute exacerbations of pericoronitis is associated with debilitating symptoms, and requires urgent intervention. Mechanical debridement, operculectomy and antibiotic therapy are parts of established treatment protocol, however, associated with many limitations. This report highlights successful management of a case of pericoronal abscess around mandibular third molar in a 30-year-old female, with GaAlAs diode laser-assisted disinfection and operculectomy. Although infection was initially associated with lymphadenitis and fever, postoperative period was symptom free, even without use of antibiotics. Due to many intraoperative and postoperative advantages and better patient acceptance, diode laser has become a preferred option for minor oral surgical procedures.

Keywords: Pericoronitis, Periodontal abscess, Pericoronal abscess, Diode laser, Operculectomy.

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INTRODUCTION

Pericoronitis is an inflammatory condition that may accompany eruption of teeth, particularly around mandibular third molars. It may be associated with traumatic occlusion with its maxillary counterpart that often complicates the existing pathology by repeated cheek biting and consequent localized reactive proliferation of buccal mucosa. The inflamed operculum covering the partially or completely erupted mandibular third molar may get infected by microbial flora, predominantly anaerobes as it is often less accessible to routine oral hygiene activities.¹ In most cases, the symptoms are mild and infrequent,

However, exacerbation of inflammation may lead to abscess formation and/or lymphadenitis and subsequent spread to fascial spaces requiring immediate intervention. Associated symptoms often observed are fever, severe pain, trismus and difficulty in speech or deglutition, depending on the extent and severity of the condition.²

Management of such conditions include relieving occlusion from maxillary third molar, drainage of abscess, thorough debridement of tooth surface and removal of pocket lining. It is necessary to ensure that area around offending tooth are accessible to cleaning by routine oral hygiene aids so as to prevent the recurrence of infection. For that purpose, operculectomy and excision of proliferative growth from buccal mucosa is often required.

Conventional excision with scalpel is an established method of operculectomy that may be performed under local anesthesia. However, intraoperative bleeding may obliterate the operating field, and increase the chair-side time. Further, this technique results in secondary healing of wound, which is delayed and painful. Healing is often associated with trismus that affects the routine life of the patient.

The soft-tissue diode lasers have an excellent incision performance with a cutting depth of 2 to 6 mm and have an added advantage over conventional surgery in that there is sealing of small blood and lymphatic vessels resulting in hemostasis and reduced postoperative edema.³ Target tissues are also disinfected as a result of irradiation and local heating.⁴ There is decreased amount of scarring due to decreased postoperative tissue shrinkage.^{3,5} Consequently, the use of sutures is also eliminated in most of the cases.^{5,6}

In this report, we are presenting a case of pericoronal abscess around left mandibular third molar in a 30-year-old female. After abscess drainage, pockets distal and buccal to the offending tooth were disinfected with GaAlAs diode laser, along with removal of epithelial lining. Operculectomy and excision of buccal mucosal growth were done using diode laser under local infiltration of lignocaine. Healing was fast and uneventful. Patient was educated about maintaining hygiene in that area. No sign of recurrence or any discomfort has been reported in last 2 years.

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CASE REPORT

A 30-year-old lady reported with the complaints of severe pain and pus discharge from gums on the left side of lower jaw and difficulty in mouth opening for last 3 days. She also complained of pain on swallowing and mild fever since last night. She reported to have noticed mild aching pain at the same site, 15 days back, that subsided after taking paracetamol tablets. However, 3 days back pain restarted and progressively became severe, radiating to left side of the neck and left ear. She took the same medicine but condition deteriorated with fever and reduced mouth opening. The medical history was non-relevant. Differential leukocyte count was suggestive of mild neutrophilia. On examination, left submandibular lymph nodes were palpable and tender. Any extraoral swelling was not evident. On intraoral examination, mouth opening was found to be inadequate. Buccally placed third molar was completely erupted with edematous operculum and adjacent buccal mucosa. Supra and subgingival calculus was present on tooth surface. On

palpation, pus discharged from pocket around offending tooth, which was in occlusion with maxillary third molar. There were clear signs of cheek biting and reactive proliferation of adjacent mucosa (Fig. 1).

MANAGEMENT

After local infiltration of lignocaine (2%, epinephrine 1:80000), pus was drained from periodontal pocket, using universal and Gracey curettes #9-10 and #13-14). Root surface was thoroughly planed and area was irrigated with normal saline (0.9% NaCl w/v) (Fig. 2). Periodontal pockets present distal and buccal to the offending tooth were disinfected and their lining removed with a GaAlAs diode laser with 810 nm wavelength (Picasso, AMD LASERS®, Indianapolis, USA). Operculum and buccal mucosal growth around third molar was excised with laser in contact mode with pulse of 30 ms duration and 30 ms interval with initiated tip at 2.0 W power (Fig. 3). There was no bleeding after laser application (Fig. 4). Patient was asked to avoid chewing from left side and to do warm



Fig. 1: Pericoronitis abscess around left mandibular third molar. Mild proliferation of buccal mucosa due to cheek biting



Fig. 2: Abscess drained followed by thorough mechanical debridement



Fig. 3: Settings of diode laser



Fig. 4: Immediate postoperative view after operculectomy was done with diode laser



Fig. 5: Healing after 15 days

saline water rinses three times daily for 7 days. Ibuprofen 400 mg was prescribed twice daily for 3 days. There was no discomfort at the treated site after 1 week.

After 2 weeks, healing was found to be uneventful, with no history of pain, bleeding or pus discharge from the operated site (Fig. 5). Patient was trained in modified Bass technique of brushing and was explained to undergo dental consultation every 6 months. She is being followed for last 2 years, and no sign of recurrence has been observed.

DISCUSSION

Pericoronitis generally does not develop around teeth that erupt normally and are free from occlusion, rather it is commonly associated with partially erupted or buccally erupted wisdom teeth. Once the follicle of the tooth communicates with the oral cavity, it is thought that bacterial ingress into the follicular space initiates the infection. Presence of operculum and reactive growth of buccal mucosa make this area reservoir of plaque and food particles. When the gingival sulcus remains inaccessible to daily oral hygiene procedures and other cleaning aids, predominantly anaerobic flora causes chronic periodontitis with pocket formation.¹ This may exacerbate later into acute conditions.

Apart from conventional mechanical debridement and operculectomy with scalpel, electrosurgery has been utilized effectively to excise gingival tissue while simultaneously providing adequate hemostasis.⁷ Heat generation with this technique, however, occurs to a degree where an irreversible damage to the alveolar crest may result.⁸

The 810 nm GaAlAs diode laser has a very good surgical and hemostatic action during soft tissue surgeries in oral cavity.⁹ Use of the diode laser has demonstrated excellent clinical benefits which include coagulation of blood vessels and precise control of the amount of tissue

removed¹⁰ which is critical in the area around mandibular third molars.

The laser wound in the soft tissue has certain unique characteristics. It is very superficial as the thermal damage caused by the irradiation is only fractions of a millimeter in depth. The cellular disintegration caused at the impact does not allow for the release of chemical mediators of inflammation, which leads to a reduced acute inflammatory response compared with scalpel created wounds in conventional techniques. A thin layer of denatured collagen formed on the surface of the wound reduces the degree of tissue irritation from oral fluids and serves as an impermeable dressing. Additionally, there is very little wound contraction.¹¹

Surgical lasers have been found to remove diseased pocket lining epithelium, detoxify root surfaces, and assist with coagulation.^{7,12} Diode lasers used in soft-tissue surgeries treat oral tissues in a minimally invasive manner. Pericoronal microflora around mandibular third molars has a wide spectrum, with majority being anaerobic. Disinfecting property of diode laser has been widely reported and may be an added advantage, when treating these infected sites.¹²

Since, area around the mandibular third molar has many important anatomic structures, precise cutting of tissue with clear operative field is strongly recommended. It can be achieved well by a diode laser without damaging the hard tooth structure.⁵

Another important factor supporting the use of lasers in minor oral surgical procedures is the patient preference. Due to little morbidity compared to the conventional surgery, that often results in bleeding and painful healing, in addition to taking more chairside time, diode laser has been preferred by patients as well as clinicians.⁸

Although many lasers have been successfully tried for the purpose of precise incision in a clear field, diode is cost effective, easy to operate and portable. Due to many advantages over conventional options, it appears reasonable to use diode lasers in similar pathological conditions of oral cavity.

CONCLUSION

Pericoronitis with its acute exacerbation requires prompt intervention. Although it has been treated successfully with conventional mechanical debridement and operculectomy, GaAlAs diode lasers offer minimal invasive way with less patient morbidity to achieve similar outcome in relatively shorter duration. It can be incorporated in routine periodontal practice for better patient acceptance.

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