

# Dento Alveolar Hemorrhage following Laser Assisted Operculectomy: A Case Report

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## ABSTRACT

**Introduction:** Lasers are widely used in dental procedures. The various lasers currently employed include Diode Laser, Er:YAG, CO<sub>2</sub> Laser and Nd:YAG. Of these the diode lasers are used routinely owing to their cost and technical specifications. The list of applications for diode laser in dentistry are immense, especially in the field of periodontology where it can be used for procedures such as gingivectomy, operculectomy, frenectomy, pocket decontamination and also in various implant procedures. The most valuable advantage of soft-tissue lasers over other surgical modalities is their ability to precisely cut and efficiently provide hemostasis, thereby reducing the chances of complications compared to conventional techniques.

**Case Report:** The present case reports an operculectomy performed in relation to lower left third molar in a 37-year old male patient using 980nm diode laser. Patient developed post-operative hemorrhage within 48 hours of the treatment and was successfully managed with careful follow-up and timely intervention.

**Conclusion:** Even though lasers have a haemostatic effect on the soft tissues, a probable complication of post-operative hemorrhage should be detailed to the patient prior to the surgery. As the etiological factors for post operative hemorrhage are varied and many, careful follow-up of the patient and timely intervention can help in successful management of the condition.

**Keywords:** Diode Laser, Operculectomy, Post-operative bleeding

## INTRODUCTION

Application of lasers in dentistry and especially periodontology are rapidly increasing today. Lasers offer several advantages over conventional scalpel surgery such as precise incision of tissues, coagulation intra-operatively and postoperative benefits. Semiconductor diode lasers [Gallium arsenide (GaAs), gallium-aluminum-arsenide (GaAlAs)] are portable compact surgical units with efficient and reliable benefits that are assigned according to economic and ergonomic consideration and offer reduced costs in comparison to other modern laser devices. Diode laser (wavelengths ranging from 810 to 980 nm) are used for various periodontal procedures such as gingivectomy, operculectomy, frenectomy, pocket decontamination and also in implant surgeries, based on the photothermal effect with an excision technique, or by ablation or vaporization procedures.<sup>1</sup> The present case reports an operculectomy performed using 980nm diode laser and the post-operative bleeding that ensued after 48 hours which was successfully managed with careful follow-up and timely intervention.

## CASE REPORT

A 37-year old male patient reported to the clinic with a chief complaint of severe pain in relation to lower left back teeth since 1 week. The pain was continuous in nature that aggravated mostly on eating. Clinical examination revealed an inflamed

pericoronal flap in relation to lower left third molar (Figure-1) associated with tenderness and unilateral submandibular lymph node enlargement. There was mild extra-oral swelling along with signs of trismus. Patient was on self-medication with analgesics to control the pain. Patient did not report any other significant medical or drug history.

OPG and IOPA of the involved area did not reveal any underlying pathology. Patient was put on a course of antibiotics (Tab Amoclav 625mg; amoxicillin and clavulanic acid and Tab Meterolag 500 mg; Meteronidazole) and analgesics (Tab Brufen retard 800mg) for 1 week. Patient was also instructed to perform salt water gargling and hot water fermentation.

After a week, the patient reported for the treatment of the infected operculum. The advantages and disadvantages of both conventional operculectomy i.e with a surgical scalpel and laser assisted operculectomy were explained to the patient and the latter was chosen by the patient.

**Laser assisted Operculectomy:** Informed consent was taken from the patient prior to the procedure. Operculectomy was performed with a diode laser 980nm (DenMat, USA) under local anaesthesia (2% Lidocaine HCl) adhering to optimum laser safety protocols. Lasing was carried out with a 200um fiber tip at 1W pulsed mode initially with the pulse width set at 500msec. This was mainly done to provide the tissues sufficient relaxation time. Following this, lasing was continued for 1 minute at 3W continuous mode. Total time taken for the procedure was 2 minutes with 10 seconds interval in between (Figure-2). Copious irrigation with saline was performed to remove the debris and the area was cleaned using a sterile gauze dipped in betadine. Patient was advised to take analgesics for 2 days following the procedure and was instructed to avoid any hard or spicy food.

After 48 hours, continuous bleeding from the treated site was reported by the patient over a phone call. The patient was instructed to keep an ice pack over the bleeding site. However, the bleeding continued and the patient visited the emergency department of a local hospital and was given Inj. Dicynone 250 (Etamsylate) to control the bleeding. The patient reported to the clinic on the following day.

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Intra oral examination revealed persistence of minor bleeding from the treated site even at 72 hours (Figure-3). The area was copiously irrigated with saline. The patient was instructed to continue the Dicynone 500 mg tablets (Etamsylate), one tablet every 6 hours for 5 days and to avoid hard food for the next 2 days. The patient was kept under daily follow-up till complete resolution of the bleeding occurred at one week. The patient was advised to perform routine blood investigation and the results did not reveal any underlying bleeding or coagulation disorders. Complete healing occurred at one month post-operatively (Figure-4).

## DISCUSSION

The chief advantage of laser assisted soft tissue surgeries is that it provides a bloodless surgical field and is a right tool for adequate haemostasis. Diode lasers in a range of 810 to 980nm wavelength is used in both continuous and pulsed mode in soft tissue surgery with the excision, vaporizing and ablative mode.<sup>1</sup> Using the right laser on the inflamed operculum makes difference in post surgical healing depending on the type of laser used.<sup>2</sup> Studies by Pirnat<sup>3</sup> demonstrated the cutting ability of the soft tissue diode laser with a depth of 2–6mm into the tissues with the sealing of small blood and lymphatic vessels as a result of the heat generated thereby eliminating bleeding and edema. A diode laser of 980nm wavelength in both pulsed and continuous wave mode was used in the present case.

Operculectomies are sometimes a suitable alternative for relieving pain when compared to third molar extractions, depending on the condition of the existing third molar, its relation to the surrounding structures and its angulation.<sup>4</sup> Post operative hemorrhage is a rare and life threatening complication, the incidence of which has been reported to be between 0.1% and 6.5%.<sup>5</sup> Very few articles in literature has mentioned the cause of postoperative hemorrhage following routine operculectomies and almost none have reported the event after laser assisted operculectomy. However, the only valid reason which could be emphasised for the bleeding observed in the present case is that temperature rise in tissue is directly proportional to the power output, spot size, pulse width and operator hand movements.<sup>6</sup> Postoperative bleeding may have varied etiologies, including slipping of ligatures and reopening of previously cauterized veins.<sup>7,8</sup> Predisposing factors such as retching and bucking during recovery and perioperative increased blood pressure are considered the most significant for causing post operative hemorrhage.<sup>9</sup>

Few studies have focused on prevention and risk factors of postoperative hemorrhage after operculectomy and most of the studies did not identify perioperative risk factors for the development of hemorrhage.<sup>10</sup> This is the first case to the authors' best knowledge that reported bleeding after routine laser assisted operculectomy, which was adequately managed with timely intervention and medication.

## CONCLUSION

As the etiological factors for post operative hemorrhage are varied and many, careful follow-up of the patient and timely intervention are necessary. Studies to evaluate the role of various laser parameters on soft tissues are required. Even though lasers have a haemostatic effect on the soft tissues, a probable complication of post-operative hemorrhage should be



**Figure-1:** Pre operative view of inflamed pericoronar flap in relation to 38; **Figure-2:** Persistent bleeding at 72 hrs after Laser assisted Operculectomy.



**Figure-3:** Postoperative view after 1 week following Laser assisted Operculectomy; **Figure-4:** Post-operative view at 1 month.

detailed to the patient and updated on the consent form.

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