



SCALPEL-LESS EXCISION: BOON IN PEDIATRIC DENTISTRY

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ABSTRACT

This article highlights the use of lasers in the treatment of the exposure of unerupted tooth and mucocele. Unerupted tooth after average age for eruption of tooth can be due soft tissue or hard tissue impaction. In this case report the exposure of unerupted tooth by laser was done for painless removal of overlying gingiva. Exposure of soft tissue can be done by scalpel, electrosurgery and laser. However, the use of lasers provides many advantages compared to other methods. The advantages of laser over scalpel surgical procedures include greater precision, a relatively bloodless surgical and postsurgical course, sterilization of the surgical area, minimal swelling and scarring, coagulation, vaporization and cutting with minimal or no suturing, and less or no postsurgical pain. Second case is mucocele, which is usually a painless, thin sac seen on the inner surface of the lips. It contains clear fluid. It is painless but can be bothersome. The cyst is thought to be caused due to sucking of the lip membranes between the teeth. A mucous cyst is common and harmless. However, if left untreated, it can organize and form a permanent bump on the inner surface of the lip. A mucous cyst is called ranula when it occurs on the floor of the mouth and epulis when it occurs on the gums. The sac may also be formed around the jewellery (piercings) that has been inserted into the lips or the tongue.^[2]

KEYWORDS: Laser, Lip, Mucocele.

INTRODUCTION

Modern dentistry is based on minimally invasive concepts. Despite the fact that more than 50 years ago a first-generation air-abrasion engine was proposed as a non-drilling technique for cavity preparation, it is only thanks to current, finer caries diagnosis and adhesive dentistry that more attention has been paid to micro preparations.^[1]

Laser technology was also developed for dental purposes, and nowadays several oral applications are available for a variety of indications.

The word LASER is an acronym for Light Amplification by Stimulated Emission of Radiation.

Dental lasers can be used to cut, incise and ablate hard and soft tissues. The inherent properties of laser light such as selective absorption, coagulation, sterilization,

and stimulatory effects on vital structures make lasers the treatment of choice in certain clinical scenarios.^[2]

Over time, various laser types (neodymium-doped yttrium aluminium garnet [Nd:YAG] laser, erbium laser, carbon dioxide [CO₂] laser, diode laser) with different wavelengths were developed and became available in dentistry. Among the various lasers, diode lasers are the most frequently used in dentistry.^[4]

Several advantages of diode lasers are as follows:

- 1.) Extreme compactness,
- 2.) Affordability,
- 3.) Ease of operation and simple setting-up,
- 4.) Versatility and small size.

In addition, applying diode lasers:

- Decreases the need of anesthesia.
- Significantly controls hemostasis.

- Provides a relatively bloodless surgical and postsurgical course.
- And generally does not require sutures.

The active medium of the diode laser is a solid state semiconductor made of aluminum, gallium and arsenide, which produces laser wavelengths in the near infrared spectral region, between 808 and 980 nm.^[5]

The diode wavelengths are highly absorbed in hemoglobin and melanin and have little absorption in dental hard tissue.

This gives the diode laser the ability to act selectively, and precisely cut, coagulate, ablate or vaporize the areas around dental structure with less damage and better post-operative healing.

The beneficial effect of using diode laser in dentistry has been investigated in different studies. For instance, Romanos and Nentwig used diode lasers in a variety of oral soft tissue surgeries and observed numerous intraoperative and postoperative clinical advantages including sufficient hemostasis, precise incision margin,

lack of swelling, bleeding, pain or, scar tissue formation, and good wound healing.^[6]

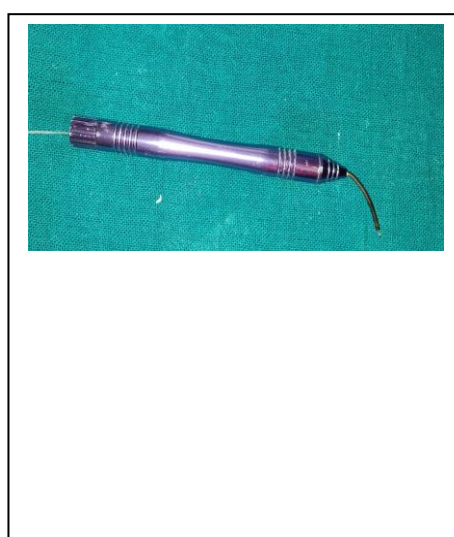
Clinical experience has shown there are many benefits of treating children with lasers over conventional methods reduces chair time for similar procedure, eliminates use of high speed drills with its associated vibrations, use of scalpels, smell, fear factor and reduces the use of local anaesthetics, suturing, pain and medications.^[7]

CASE REPORTS

Two patients reported in Out Patient Department of department of Pedodontics and Preventive Dentistry of Shree Bankey Bihari Dental College. After careful evaluation of medical history and oral examination, oral diagnosis and treatment plan of each patient was established as follows:

- (1) A 9-year-old female with unerupted left and right maxillary lateral incisors;
- (2) A 6-year-old female patient with mucoccele on lower lip.

The treatment plan for both the patients was laser surgery with diode laser at 980 nm, in continuous mode.



CASE 1

A 9-year-old female patient reported to the department of Pedodontics and Preventive Dentistry with a complaint of unerupted teeth in upper front tooth region. Whenever there is delay in the eruption of the tooth there are two reasons i.e. soft tissue or hard tissue impaction. The patient's medical history was unremarkable. On oral examination, the patient was confirmed to have unerupted maxillary right and left lateral incisors which were present and were covered by soft tissue. As we know that the average age of eruption of maxillary lateral incisors is 7-7.5 years. For diagnosis we took IOPAR of

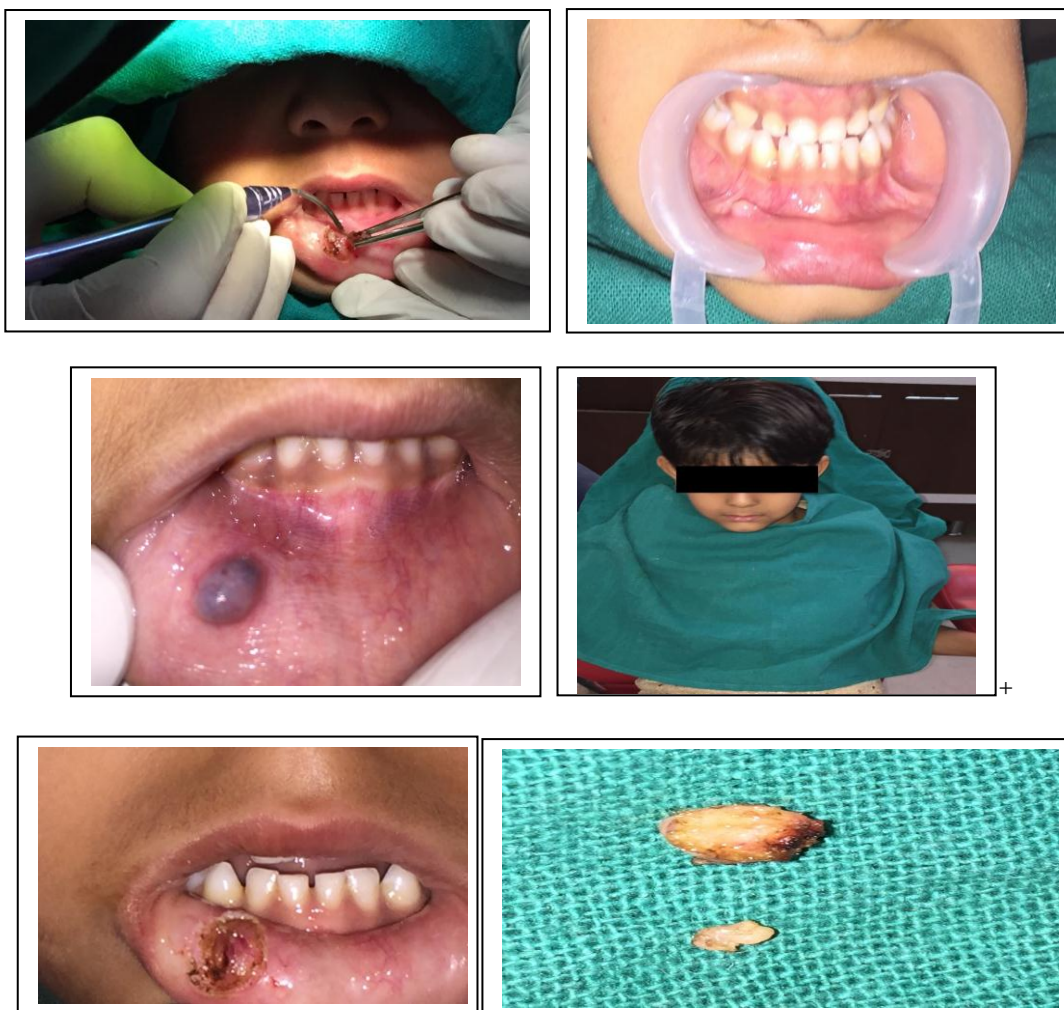
that region and with a periodontal probe we measured the soft tissue width covering the teeth.

Exposure of left and right maxillary lateral incisor with diode laser was planned for the patient. The procedure was carried out with infiltration of local anesthesia. Then, the 400 μ m initiated tip of diode laser was used in contact mode to cut the gingiva with an output power of 1.0 W in CW mode and to expose the tooth with no bleeding. No wound dressing was used after surgery. Good initial healing was observed.

**CASE 2**

A 6-year-old female patient reported to the department of Pedodontics and Preventive Dentistry with a complaint of swelling on right side of her lower lip. The patient's medical history was unremarkable. History of repeated biting on lower lip was provided by the parent. On oral examination, the patient was confirmed to have mucoccele. Excision of mucoccele with diode laser was

planned for the patient. The procedure was carried out with infiltration of local anesthesia. Diode laser was applied with 980 nm wavelength (zolar photon plus) a power of 1.5 W, CW mode and in contact mode. Neither surgical suture, nor wound dressing was used after surgery. Recovery was achieved by secondary intention and good initial healing was observed.



Analgesics (Ibuprofen 200mg, SOS) was prescribed for both the patients in case of pain.

Antibiotic was not prescribed to any of the patients.

Topical application of Vitamin E was done in each case.

In all the cases, safety glasses were provided to the patients, dentist and dental assistant to prevent possible eye damage by the laser irradiation.

After explaining the procedure, an informed consent form was obtained from the parent/guardian of the patient.^[7]

DISCUSSION

This article presents few soft tissue surgeries in pediatric dentistry, which were successfully performed by the 980 nm diode laser.

Although these procedures could have been done with conventional surgery and the use of scalpel and suture, we preferred the diode laser surgery due to its advantages, which resulted in shorter operative time, faster recovery, less fear and increased pediatric patient and parent satisfaction.^[8]

In the current study, patients generally reported little discomfort during the post-operative course. Also, no signs of local infection were seen on follow-up sessions.

The advantages of using laser surgery are as follows:

- 1.) Less or no post-operative pain due to the sealing of the sensory nerve ending with the heat of the laser beam.
- 2.) Diminished hemorrhage which provides better vision for operator
- 3.) Little post-operative edema
- 4.) Minimal or no suturing
- 5.) Less anesthesia and minimal risk of infection due to the laser's capability of sterilization.

Other studies demonstrated the clinical advantages of using diode lasers in dentistry. For example, a clinical study compared the use of diode laser with conventional surgery in the management of soft tissue mucogingival problems associated with orthodontic treatment. The authors reported that patients treated with the diode laser required less infiltration anesthesia and had rapid postoperative hemostasis with no sutures and an improved postoperative comfort and healing.^[9-11]

Moreover, Stubinger et al showed that the intraoperative and postoperative clinical findings of utilizing diode laser in patients needing oral soft tissue surgery were excellent due to sufficient cutting abilities, good coagulation effect and extremely small zone of thermal necrosis of surrounding tissue. They recommended diode laser as an alternative solution to conventional electrosurgery and scalpel.^[12-15]

CONCLUSION

This case report draws light on the versatile use of 980 nm diode laser due to the variety of oral soft tissue procedures that can be performed successfully with the 980 nm diode laser.

After the successful outcome of the treatment provided to the patients, we suggest the use of diode laser as an alternative to conventional surgery in the field of pediatric oral soft tissue surgery.

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