

Case Report

Management Of Operculum On A Maxillary Central Incisor Using Diode Laser

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ABSTRACT:

Maxillary incisors that do not erupt at the predicted period can significantly affect dental and facial aesthetics, thus it is advisable for the doctor to identify the aetiology and develop a suitable treatment strategy. Lasers like the argon, diode, Nd: YAG, CO₂, and erbium have made it possible for dentists to calm anxious patients during dental procedures; as a result, lasers have revolutionised paediatric dentistry. The following case report focuses on the management of operculum on a maxillary central incisor using diode laser

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INTRODUCTION

Maxillary incisors that do not erupt at the predicted period can significantly affect dental and facial aesthetics, thus it is advisable for the doctor to identify the aetiology and develop a suitable treatment strategy. Lasers like the argon, diode, Nd: YAG, CO₂, and erbium have made it possible for dentists to calm anxious patients during dental procedures; as a result, lasers have revolutionised paediatric dentistry. An overview of the diode laser's use in guiding the unerupted upper incisors into occlusion in mixed dentition is given in this article. Today's minimally invasive dentistry is the foundation of contemporary dental principles. Laser technology has paved the way for a revolution in dental care among other technological advancements. "Light Amplification by Stimulated Emission of Radiation" is what the acronym "Laser" stands for [1]. Nowadays, the laser has a wide range of applications in dentistry, taking place of the scalpel and hand piece's whirring noise. The utilisation of light energy rather than rotational forces and cutting blades is the fundamental idea behind laser applications. According to

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"Children are the first in queue to receive dental laser treatment." [2] Laser-supported dental treatment is a great strategy from the perspective of tissue preservation. The use of several types of laser equipment enables the paediatric dentist to provide dental care in a minimally invasive manner with low discomfort, less bleeding, and painless treatment and recovery. Unerupted maxillary incisors can significantly affect dental and facial aesthetics, so it is advisable for the physician to ascertain the cause and develop a suitable treatment strategy when they don't erupt as predicted. [3] Operculum is the flap from the gingival tissue that is typically present distally to a molar or that covers the occlusal surface of the molar and frequently manifests as a complication of tooth eruption [4]. The masticatory forces from the opposing molar teeth can occasionally hurt the operculum and in this case the operculum may become inflamed and ulcerated as a result of repeated trauma or a local inflammatory response brought on by the buildup of plaque and food particles between the operculum and the tooth's surface. Traditionally, surgical scalpels were used to remove the fibrotic gingiva that covered the unerupted teeth. Scalpel use results in discomfort and drawn-out recovery. The development of soft

tissue lasers offers a quick and secure alternative to conventional techniques because they allow for a bloodless environment while also lowering the risk of infection, swelling, and discomfort in addition to worry and anxiety [5].

DIAGNOSIS AND MANAGEMENT

Andreassen and Kuroi classified failure of eruption under three clinical conditions [5]: Impaction that is the stop of the eruption process due to a physical obstruction radiographically or clinically detectable Primary retention that is a disturbance in the eruption process before the tooth has surfaced in the oral cavity Secondary retention that is a stop in the eruption process after it has already begun, and the tooth had already penetrated the gingiva in absence of any physical obstruction When one or both of the central incisors remain unerupted and the lower incisors have erupted more than a year ago, or when there is a deviation from the normal eruption sequence (such as the lateral incisors erupting before the central incisor), [6] delayed eruption of the maxillary incisors requires monitoring or intervention.

ETIOLOGY

HEREDITARY

Odontomes, extra teeth, cleft lip and palate, cleidocranial dysostosis, generalised delayed eruption, and gingival fibromatosis [6].

ENVIRONMENTAL

Trauma, early tooth extraction or loss (with or without space loss), retained Primary teeth, cyst formation, endocrine disorders, and bone disease.

TREATMENT MODALITIES

- Wait and evaluate
- Use of scalpel
- Electrocautery
- Use of laser

PREVALENCE/INCIDENCE

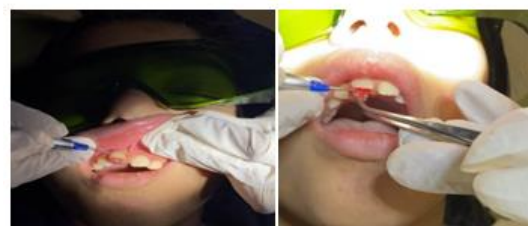
In the age range of 5 to 12 years, the incidence of an unerupted maxillary central incisor has been observed to be 0.13%. The prevalence has been calculated at 2.6% in a population that has been referred to local hospitals [7].

CASE REPORT

A 10year old female patient reported to the Department of Paediatric and Preventive dentistry in Inderprastha dental college and hospital, Sahibabad, with the chief complaint of delayed eruption in upper front tooth region. Complete history pertaining to unerupted tooth was taken. Patient parents complained of delayed eruption of her front teeth since two months. There was no other dental complain including pain and sensitivity. It was noted that the contralateral tooth was erupted. On general examination child was at cooperative stage. Extra oral examinations showed

symmetrical face and there was non- contributory family history. Intra oral examination revealed dental caries with respect to 85 and the gingiva, lips, floor of the mouth and buccal mucosa were clinically normal in appearance. The treatment modalities were explained to the parents and they were convinced that the treatment to be carried by diode laser. We used 810nm diode laser to remove the overlying fibrotic tissue. Local anesthetic gel was applied for one minute after which local anaesthetic infiltration was given. Initially laser settings were started from 0.5W and then slowly increased to 1.5W to complete the procedure. Photographic recordings were done before during and after the procedure. The Patient was recalled after 1 week.

PRE-OPERATIVE



DURING THE PROCEDURE



IMMEDIATE POST- OPERATIVE VIEW



RECALL AFTER 1 WEEK

DISCUSSION

Missing upper incisors are regarded as unattractive therefore it is crucial to identify and address the issue

as soon as possible. This may have an impact on self-esteem and overall social interaction. It has been estimated that 0.13 percent of children aged 5 to 12 have an unerupted maxillary central incisor [1,6]. The prevalence has been determined to be 2.6% in a population that has been referred to local hospitals. To find primary teeth that haven't fallen out by the expected dates, an intraoral examination should be done. It has been demonstrated that the use of a horizontal parallax approach is superior to a vertical radiography technique for a detailed assessment of location [7]. Cone beam computed tomography technology, which is more recently accessible, can be utilised to locate impacted teeth, particularly incisors, by imaging the maxillofacial region. A 12-month delay is often thought to be of little or no significance even though a permanent tooth should typically emerge no later than six months after the natural exfoliation of its predecessor [8]. The surgical procedure of removing the operculum, or the gingival flap that typically partially covers the occlusal surface of the tooth, is known as operculectomy. The goal of an operculectomy is to lower the occurrence of pericoronitis, a disorder characterised by pain and inflammation around the operculum. The diode laser operculectomy procedure was chosen as the course of treatment because it offered a number of benefits over the traditional scalpel surgical procedure [9]. Its benefits in soft tissue procedures include improved precision, readily attained hemostasis, less tissue necrosis from heat compared to electrosurgery, a faster rate of wound healing, sutureless surgery, lower post-operative pain, and discomfort with a decreased need for analgesics [10]. Most laser procedures can be performed with just topical local anaesthesia, which improves patient cooperation and shortens procedure times, which is especially important in paediatric situations. Additionally, since lasers have a bactericidal effect on the surgical site, postoperative antibiotic need is decreased. Aluminium or indium, gallium, and arsenic are used in some combination to make diodes from semiconductor crystals. The optical resonator mirrors for this diode laser are directly attached to its ends, and the pumping mechanism is an electrical current. The wavelengths that are suitable for dental applications vary from around 800nm for the active medium made of aluminium to 980 nanometers for the active medium made of indium, placing them at the start of the near-infrared region of the invisible nonionizing spectrum [11]. Each device uses fiberoptic delivery of laser energy in the continuous wave and gated pulsed modes, and it can be utilised in contact with soft tissue for surgery or out of contact for deeper coagulation. Depending on the mode, the energy is delivered by a fiberoptic network. Similar to chromophores or chemical substances, diode lasers are absorbed by haemoglobin and melanin. In light of the fact that haemoglobin in

blood is absorbed by diode lasers, which are good for treatments involving pigmented soft tissue as a result, are effective hemostatic devices. Most of the time, only topical anaesthesia is needed instead of local anaesthesia when only soft tissue needs to be removed. The laser beam should be held parallel to the tooth surface because this laser also affects hard tissues and could potentially etch nearby teeth [12].

CONCLUSION

The goal of an operculectomy is to remove the operculum, or gingival tissue flap, that is present over a completely or partially erupted tooth, typically in molars and that, if left untreated, may result in pericoronitis and the symptoms that go along with it. In comparison to the traditional method, where patient cooperation and procedure time must be taken into consideration, operculectomy employing soft tissue lasers may be thought of as a more advantageous choice in paediatric dentistry.

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