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LASER-ASSISTED EXCISION OF A GINGIVAL OVERGROWTH IN A PEDIATRIC PATIENT – A CASE REPORT

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ABSTRACT

Lasers have been a boon to dentists by making surgical procedures painless and providing a bloodless working area. It has especially been useful to Pedatric Dentists given the behavioural issues involved in children's treatment. The present case report highlights the use of diode laser (940±10nm) for the excision of a gingival overgrowth in a 13-year-old patient. The patient was comfortable throughout the procedure and did not require analgesics post-procedure. Moreover, a bloodless working field made it efficient to restore the tooth in the same appointment. These advantages enable a better patient compliance and increased operator efficiency therefore, presenting a strong requiremntt for lasers to be incorporated into dental practice as a viable alternative to the traditional scalpel surgery.

KEY WORDS: Diode Laser, Laser, Operculectomy

INTRODUCTION

Gingival overgrowth is caused due to the enlargement of the attached gingiva due to an increase in the number of cells. Hyperplasia is a histological term which is used to describe the increase in the size of an organ due to an increase in the number of cells.[1] Severe gingival overgrowth is damaging and can interfere with both mastication and speech. The

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treatment of gingival overgrowth can be categorised into surgical or non-surgical methods. Non-surgical methods include the use of antiseptic mouthwashes, use of systemic antibiotics and change in medication. Surgical methods include scalpel gingivectomy, electrosurgery, laser gingivectomy and flap surgery. Scalpel gingivectomy was initially considered a 'standard treatment'. However, due to the multiple disadvantages such as peri-operative haemorrhage, poor esthetics and excessive pooling of blood, electrosurgery and laser gingivectomy are recommended. [2]

The word "laser" is an phrase for "Light Amplification by Stimulated Emission of Radiation." Introduction of lasers into dentistry in 1990's gave the much needed impetus and has increased the acceptance rate of most of the dental treatments. Various advantages of lasers such as minimal use of anesthesia, enabling a bloodless field with a laser bandage of the wound and provision of hemostasis convinced numerous clinicians to incorporate lasers as an integral part of the dental practice with promising results. The benefits of lasers were enumerated by numerous authors in pediatric dentistry explaining how this cutting edge technology proved to be a boon for apprehensive patient, providing the intended treatment with ease, comfort and helped in establishing the necessary trust between the patient and the specialist, the cornerstone of pediatric dental treatment. [5,6] The present case report highlights the uses and advantages of diode lasers (940±10nm) for the treatment of gingival hyperplasia.

CLINICAL PRESENTATION

An 13-year-old patient reported to the Department of Pediatric and Preventive Dentistry of D.Y. Patil University - School of Dentistry with a chief complaint of a gingival overgrowth of the gum in relation to the lower right back tooth region since 1 month. The patient was undergoing root-canal treatment with respect to the area of chief complaint. On further elucidation of the history, he complained of pain associated with the growth on brushing. His medical history was non contributory. Intraoral examination revealed a reddish-pink soft gingival overgrowth of 4X3 mm in size, localized to interproximal area and with relation to 46 (Fig. 1 & Fig. 2). The oral hygiene status of the patient was fair.

CASE MANAGEMENT

The procedure was explained and an informed consent taken from the parent. A topical anesthetic comprising 2% lidocaine hydrochloride gel was applied with a waiting period of 3 minutes. All the necessary precautions including wearing of protective glasses by clinician, assistant and the patient were done prior to the laser treatment. A diode laser (Biolase,

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ezlaseTM) with an 940nm wavelength was used. The gingival overgrowth was removed using a 400µm fiber tip with a laser power setting at 0.8 Watts in a pulsating mode using an initiated tip with small strokes in contact mode progressing from the distal aspect towards the mesial area. The entire overgrowth was excised as per the outline marked by the laser prior to the procedure. The fiber tip was cleaned of the debris with wet gauze. The entire procedure was accomplished within 5 minutes without any pain, much to the astonishment of the child and the parent. There was completely bloodless field uncovering the decay with respect to 46. (Fig. 3) The root canal treatment with respect to the tooth was completed at the same appointment. No antibiotics or analgesics were prescribed. A telephonic conversation with the patients parent post-operatively revealed that the patient was at ease with neither pain nor discomfort. Vitamin E, in gel form, was also prescribed to the patient to apply post-operatively to apply in the region of chief complaint.

DISCUSSION

Various modalities of treatment have been attempted for the excision of a gingival hypertrophy ranging from scalpel to electrocautery with varying degrees of success.[3,4] Though electrocautery provides better visibility and is more conservative than the scalpel wound, poor healing and presence of a flesh burning odour associated with an excessive heat buildup, compromising the osseous architecture have dented it’s benefits over time.[13,14] Lasers on the other hand have a vast array of benefits such as providing a bloodless field, improving the visibility with minimal use of anesthesia and absence of any sutures and reduced operative time with very minimal post operative pain.[15, 16] Lasers with varying wavelengths, right from CO2 (10,600nm), Er:YAG (2940nm) , Nd:YAG (1064nm) to Er,Cr:YSGG (2780nm) have been used by pediatric dentists worldwide for an array of soft tissue and hard tissue procedures. Caries removal, cavity preparation, pit and fissure sealants, laser analgesia etc are some of the applications performed by the hard tissue lasers. Soft tissue lasers such as the Nd: YAG and the diode lasers are useful in applications such as exposure of the tooth to aid in proper eruption, ankyloglossia, frenectomy and gingival remodeling or gingivectomy to name a few attributed to their excellent hemostatic abilities.[7-12] The primary purpose of utilizing a laser in our present case report was to create an atmosphere devoid of fear and anxiety while enhancing the treatment acceptability, and to serve this purpose a diode laser was the ideal choice with its excellent hemostatic abilities and portable size. Diode laser is a semiconductor laser that uses solid state elements, such as Gallium, Arsenide, Aluminum, and Indium. These are available in wavelength’s of

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810 to 980nm.[15, 17] In our present case report, we have used the diode laser with a wavelength of 940 nm for the excision of the gingival overgrowth. Unlike the other lasers which have affinity towards water and hydroxyapatite, a diode laser has an affinity for pigmented and vascular lesions comprised of chromophores like melanin and hemoglobin, making it an efficient tool for coagulation.[17] Hence, with the use of diode laser we were able to attain immediate hemostasis with enhanced visibility and were able to mark the boundaries of the carious tooth. Diode laser cuts and coagulates as well as sterilizes the area, leading to minimal inflammatory response eventually resulting in less post operative discomfort. Numerous studies have given credible evidence that lasers have attained hemostasis enhancing post operative wound healing with reduced discomfort without the need for any analgesics.[18-21]

CONCLUSION

Diode lasers have emerged as a 'Magic Wand' in minimally invasive pediatric dentistry and has proven to be successful for the treatment of reactive lesions of the gingiva. However, well documented case series with long term follow up is required to evaluate the clinical effectiveness for incorporating lasers as a regular tool in pediatric dental practice.

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Fig 1: Presence of gingival overgrowth with respect to the lower right first permanent molar

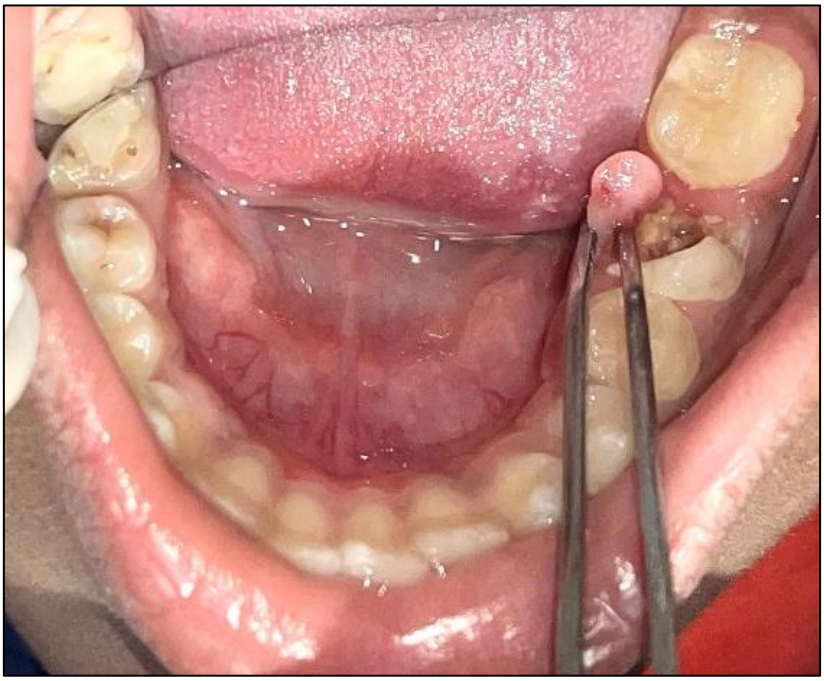

Fig 2: Assesment of the size of gingival overgrowth with respect to the lower right first permanent molar

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Fig 3: Post-excision of the gingival overgrowth