



LASER IN PEDIATRIC DENTAL PRACTISE

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ABSTARCT

A pulp polyp or hyperplastic pulpitis is inflammation of the exposed dental pulp owing to an open cavitated carious lesion, tooth fracture after trauma or long-standing fractured restoration. Type I hypersensitivity reactions may also have a role in pathogenesis of pulp polyps because of the higher concentration of histamine, immunoglobulin E and interleukin in primary or permanent teeth. Removal of the polyp, pulpectomy and root canal therapy are considered for treatment of this clinical entity. Diode laser is very safe and useful for aesthetic periodontal soft-tissue management because this laser precisely ablates soft tissues using various tips, and the wound healing is more favourable, which leads to minimal thermal alteration of the treated surface.

KEYWORDS: Diode Laser; pulp; tissue; inflammation.

INTRODUCTION

The name 'LASER' stands for "Light Amplification by stimulating emission of radiation".¹The meadow of restorative dentistry has used lasers, for excavation of caries, soft tissue recontouring and this is where laser therapy evolved from in dentistry. Lasers have been also used earlier for tooth preparation and also for canal sterilization. Laser assisted tooth bleaching has gained immense popularity in aesthetic dentistry.^[2]

Plaque associated gingival and periodontal procedures including mechanical debridement of root surfaces and pockets are being treated with lasers as a substitute. Lasers also are an adjunct in treating soft tissue lesions including treatment of OSMF and Leukoplakia.^[3]

The pulp polyp, also known as chronic hyperplastic pulpitis or proliferative pulpitis, is an uncommon and specific type of inflammatory hyperplasia that is associated with a vital tooth. Pulpal diseases are broadly divided into reversible and irreversible pulpitis and are based on the ability of the inflamed dental pulp to return to a healthy state once the noxious stimulus has been removed. In the case of the pulp polyp, the disease

process is irreversible so it causes inflammation of the tissue, which fill the tooth cavity.

The current case series describes one cases of removal of pulp polyp using soft tissue diode lasers and eruption cyst, which is a simple, efficient method that produces good results with patient's comfort.

CASE 1

Twelve year-old male patient visited the department of Pedodontics and Preventive Dentistry, Shree Bankey Bihari Dental College with complaints of deep caries and an exophytic mass at a right upper back tooth region.

The patient's medical history showed no systemic medical problems, no allergic reaction, no use of medications or recreational drugs and no history of any past surgical procedures. Thus, the patient was not referred for any medical consultation.

Oral and maxillofacial examination of the patient revealed no temporomandibular joint disorder or myofascial disturbances, no functional or parafunctional habits, a Class I occlusion and poor oral hygiene.

Clinical findings

In the oral examination process, the exophytic mass was found to be interfering with eating and occlusion, causing intermittent pain and simultaneous bleeding.

Diagnosis

The radiographic examination showed internal root resorption at the middle third and large dental carious lesions in the first right molars of the maxilla (Fig. 1). The patient was thus diagnosed to have a pulp polyp.



Fig. 1: preoperative view of Pulp polyp.

After the parent signed the consent form, the operation area was anaesthetised with posterior superior alveolar nerve block with 2 % lidocaine (1:80,000 adrenaline; 1.8 ml).

The patient, operator and the assistant wore the eye protection guards. After reviewing the patient's information (examination sheet and radiograph, consent form, etc.), patient was asked to rinse his mouth with a 0.2 % chlorhexidine oral rinse for about one minute.

The pulp polyp was removed with a high-power diode laser and the canal pulp chamber was cleaned with a cotton pellet soaked in normal saline for five minutes, followed by low-level diode laser irradiation of the canals.

The laser parameters applied for the pulp polyp removal were as follows: wavelength of 980 nm, power of 1.2 W, continuous wave and contact mode. After completing this procedure, Low Level Laser Therapy (LLLT) was performed (Figs. 2).



Figs. 2: Diode laser was used for removal of pulp polyp.



Figs. 3A: Open cavity with carious after removal pulp polyp.



Figs. 3B: Removed pulp polyp.

The patient did not experience any discomfort and was satisfied with the result. A root canal treatment was done in the successive appointments.

Case 2

A 5 year old male patient reported in the department of Pedodontics and Preventive Dentistry, Shree Bankey Bihari Dental College with a chief complaint of swelling in upper front tooth region. On Clinical examination, there was a swelling, which was palpable, and with no exudates in relation to unerupted 21. On radiological examination, a well-defined radiolucency was seen around the crown of 21. A provisional diagnosis of an

eruption cyst was made. Laser tip was used in contact mode with a power of 2 W and gingival troughing was done in the region of missing teeth and cyst was excised. No pain or bleeding was reported (Figure 4A, B, C). The excised epithelium was then sent for a histopathological examination.



Figure 4 A: Swelling the region of 21.



Figure 4 B: Occlusion view of the region of 21.



Figure 4C: Exposure of crowns by diode Laser.

DISCUSSION

Diode lasers are used extensively in dental practice. Laser-tissue interaction with a high-power diode laser is based on photo thermal effects while LLLT works based on a photochemical mechanism. Since LLLT is dose-dependent, the laser parameters have to be respected

carefully.^[4] The precise molecular mechanisms for LLLT are not entirely clear, but its clinical effects on pain control, inflammation reduction and wound healing are well investigated.^[5]

Wennstrom et al. reported that removal of pulp polyp with laser showed better clinical and radiographic results in human primary molars than did electrosurgery in order to achieve good coagulation. Aleksic et al. have applied low-level diode lasers used for the removal of pulp polyp shows less post operative pain and discomfort the surgical blade.^[6,9]

Laser at 800 to 980 nm is poorly absorbed in water; but it is highly absorbed in other pigments. Because of its hot fiberoptic tip, it produces a thick coagulated layer. No deleterious effect on the root surface is reported by use of diode laser. Thus, it is considered that soft tissue laser surgery can be performed safely and efficiently when compared to traditional treatment approaches. In a study conducted by Bragger, they showed periodontal tissue response after crown exposure.^[7] The chief advantages are: (1) relatively bloodless field (2) ability to vaporize tissue (3) Provide adequate sterilization and (4) minimal post-operative pain and swelling.^[8-10]

CONCLUSION

It is clear that the aim of diode laser application in pulpotomy, pulpectomy and canal sterilization can be very different. In this case, a high-power diode laser was applied for pulp polyp removal and coagulation, and LLLT was used to promote the healing process and for canal sterilization. Based on the laser protocol applied in this study, diode lasers can be successfully used for removal of pulp polyps and for excision of soft tissue cysts like eruption cyst. It can be summarized that diode laser application appears to be a safe and alternative procedure for management of above mentioned cases.

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