INTRODUCTION:

Extraction and extraoral endodontic treatment followed by tooth replantation had been developed as an alternative treatment for complicated or failure endodontic therapy. Conventional endodontic therapy was reported with success rates from 61% to 93% for molars; 1) while surgical endodontic therapy with success rate from 71% to 90%. 2) However, in both conventional and surgical endodontic treatments, problems in obtaining operation access due to associated structures such as maxillary sinus, restricted mouth opening or combination of endodontic and periodontic problems, could contraindicate the conventional and surgical endodontic treatments.

In these cases, extraction and extraoral treatment under direct vision can be the procedure of choice.

Although, this procedure can be an alternative way, the technique may come with risk of root resorption. 3) This is most likely due to extraction trauma and infected remnants. Laser therapies have long been proved for bactericidal and biostimulation effects. In the present case, a pulpitis combined severe periodontal destruction molar was extracted with an Er:YAG laser for thorough degranulation and disinfection. Before the extraction and right after the treatment, low level laser therapy (LLLT) with 810nm diode was applied for biostimulation.

CASE REPORT:

A fifty-year-old male patient came for his aching tooth number 46 with no known medical condition, nor

Background and aim: Although intentional replantation for extraoral treatment is a solution for complicated endodontic cases, it is accompanied with risk of root resorption which is most likely due to extraction trauma and infected remnants. Laser therapies have long been proved for bactericidal and biostimulation effects. In the present case, a pulpitis combined severe periodontal destruction molar was extracted with an Er:YAG laser for thorough degranulation and disinfection. Before the extraction and right after the treatment, low level laser therapy (LLLT) with 810nm diode was applied for biostimulation.

Result: Patient reported no post operative pain after laser treatment. Clinical follow-up showed uneventful healing, and excellent bone regeneration.

Conclusion: The Er:YAG laser coupled with low level laser therapy (810 nm diode) has shown to assist and improve intentional replantation in disinfection procedure, and it may preserve more vital cells and enhance bioregeneration for less operative pain and better healing.

Key words: laser therapy, intentional replantation, complicated endodontic case, disinfection, LLLT, biostimulation

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smoking habit. There were three fistulas in the buccal side. The tooth was painful upon biting and had grade II mobility. (Fig.1)

Periapical radiographic examination showed alveolar bone destruction all around the roots (Fig.2). According to the patient, his lower right first molar was painful for a couple of days; however he was too busy to visit the dentist until the pain eventually went down. Treatment plan was discussed with patient and decided to treat pulp and periodontal tissue with laser at the same time. That way, the bacteria was attempted to be removed completely and minimized the chance of recurrent.

Before the procedure, Amoxicillin 500 mg was given, and local tissue was stimulate with diode laser 810 nm, 50 mW for 3 minutes. Then the tooth was extracted carefully avoid extraction trauma for better regeneration. In order to minimize the time, when the tooth is out of the body during that the PDL cells is out of blood supply and increase the chance of infection,
Fig.6: Root canal obturation

Fig.7: The occlusion was relieved and tooth was replanted carefully

Fig.8: Radiographic examination right after tooth replantation

Fig.9a: before treatment

Fig.9b: 3 months after, note the healing of periapical lesion

Fig.10a: Tooth preparation

Fig.10b: Crown delivery
degranulation and disinfection of the extraction socket with laser were operated simultaneously with the operation of tooth. (Fig.3)

Granulation tissue on the root surface was removed with Er:YAG laser 100 mJ 30 Hz and laser disinfection was applied after all the granulation tissue was cleaned out. (Fig.4) While the tooth under root canal enlargement and Er:YAG laser disinfection (Fig.5a,b), the extraction socket was covered with wet gauze to prevent further contamination by saliva. After canal obturation with gutta-percha or Vitapex, the tooth was then replanted into socket. (Fig.6, Fig.7 and Fig.8)

Right after the replantation, low level diode 810 nm laser was applied again to the periodontal tissue for three minutes. Diode 810 nm laser; 150 mW for 6 minutes irradiation from the cheek was applied two times a week whenever patient came back for follow up. Patient reported no post operative pain after treatment. Clinical follow up showed uneventful healing, and excellent bone regeneration. Three months after tooth replantation, the tooth was firm and healthy, patient was appointed for tooth preparation and impression taking. (Fig.9a,b, Fig.10a,b) After crown installation the patient was able to eat and chew normally.

DISCUSSION:

The success rate of tooth replant was found at 39% to 62%, 9) comparing with that of conventional endodontic treatment from 61% to 93%, and surgical endodontic treatment from 71% to 90%, the primary treatment of choice should always be conservative endodontics. Before the decision is made for intentional replantation, it is necessary to determine whether the tooth can be extracted atraumatically and whether a sufficient root canal obturation can be achieved. Adequate radiographic survey should be made in order to see if the tooth can be extracted without risk of fracture, teeth with divergent roots, extensive restoration, badly caries, or post in the root canal are not indicated for tooth replantation.

The biological effects of low level laser therapy (LLLT) have been observed and proven by many researches. Enhancing microcirculatory and lymphatic systems and the healing process of the wound was shown effective results in the experiment of Lievens. 10, 11) In the present case, an 810 nm diode laser was applied, with wavelengths between 780 and 830 nm to reach a better tissue penetration and to improve bone repair. 12) Laser irradiation before operation helps activate microcirculatory systems which in turns bring more nutrition and immune cells; on the other hands, irradiation after operation helps accelerate wound healing and reduce post operative pain by preventing pulse action potential in nerves. 13) The tooth is usually firm in the socket after 2-3 weeks of application with low level laser therapy at 50 mW ~ 100 mW, 3 minutes every other day.

It was also noticed that the younger age group (10-30 years old) was found more significantly with inflammatory root resorption and periapical inflammation than in the older age group, possibly because of wider root canals and dentinal tubules which may result in bacteria and toxins passing through. 14)

CONCLUSION:

With the use of Er:YAG laser, degranulation and disinfection are able to be carried out at the same time, coupled with low level diode 810nm laser, the PDL cell on the root surface and periodontal tissue may receive the benefit of biostimulation and shorten the time of regeneration. Laser assisted tooth replantation offers a better surgical field control, decreases post operation pain, and reduces time of healing.
CASE REPORT

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