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CASE REPORT

Root Coverage with a Free Gingival Autograft using an Er, Cr: YSGG Laser

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ABSTRACT

The mucogingival problems encountered, are addressed by various periodontal plastic surgical procedures one of which is the free gingival autograft. Grafting procedures can be performed traditionally by use of a scalpel or by the use of lasers.

A case of gingival recession with a shallow vestibule, treated with a free gingival graft using an Er, Cr: YSGG laser with a wavelength of 2780 nm is presented here.

The objective was to achieve complete root coverage with increased width of attached gingiva in relation to 31 and 41.

The recipient bed preparation and harvesting of graft from donor site were done with the Er, Cr: YSGG laser using the appropriate laser parameters so as to ensure proper healing of the free gingival graft.

The results showed uneventful healing of donor site with complete root coverage and increased width of attached gingival in the recipient site.

The results of the therapy were assessed after 3 months.

Keywords: Root coverage, Free gingival autograft, Er, Cr: YSGG.

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INTRODUCTION

Free gingival autograft is one of the most dependable gingival augmentation procedures available.[1,2] They are performed for many reasons; to improve esthetics and treat root sensitivity in cases of gingival recession, to increase width of attached gingiva in individuals that are unable to maintain a narrow zone of attached gingiva, to obtain optimal depth of vestibule and enhance plaque control.[3]

These can be accomplished with conventional scalpel surgery as well as by lasers. At present, Erbium lasers have shown promising results when used as an alternative to scalpel surgery. Lasers can easily reshape soft tissue by ablation, improve hemostasis through heat induced coagulation thus providing a clear surgical field, reduce patient discomfort and anxiety during surgery and above all have a bactericidal and biostimulatory effect on the target tissue.[4,5]

In the case of the patient presented here, an Er, Cr: YSGG laser was used to accomplish complete root coverage and increased width of attached gingiva in relation to 31 and 41. Appropriate parameters were used to ensure an optimal laser beam. The details for the free gingival autograft case report are as follows.

CASE REPORT

A 25-year-old male patient came to the dental office with a complain of root sensitivity in relation to lower anteriors.

Clinical examination of the area revealed Miller's class 1 recession in relation to 31 and 41 with a positive tension test. A reduced width of attached gingiva was also observed. The recession depth measured 3 mm and local factors (plaque and calculus) were present (Fig. 1). Root coverage with free gingival autograft using an Er, Cr: YSGG laser (wavelength of 2780 nm) was planned to treat the mucogingival problem.

Supra/subgingival scaling and root planing was done in relation to lower anteriors. Palatal mucosa in relation to 24, 25 and 26 was selected to be the donor site. Recipient and donor sites for the free gingival graft were anesthetized (ICPA, India). The following parameters were used: Frequency—20 Hz; power—1.5 W; air—11% and water—9%. The recipient site was marked with a trapezoidal incision and deepithelialization was done using a Z 6, 14 mm tip (Figs 2 and 3). The root convexity was reduced with a tungsten carbide bur. It was followed by root planing with hand instruments and laser decontamination.

A tin foil, with the dimensions of the recipient site was placed on the palatal mucosa in relation to 24, 25 and 26. The dimensions of the graft at the donor site were marked with a Z 6, 14 mm tip. After incisions were made around the tin foil, one corner of the graft was held with a tissue holding forceps and the under surface of graft was dissected with the laser beam (Fig. 4). After harvesting the graft, hemostasis was achieved in the donor site using the following parameters: Frequency—20 Hz, power—2 W; air—11% and water—0% in a defocused mode (Figs 5 and 6).

The graft was transferred to the recipient site, held under pressure with a wet gauze and sutured with Oschenbein's techniqe using vicryl sutures (Fig. 7). Periodontal dressing was placed at the surgical site. No stent was given to protect the donor site.

Postoperatively, patient was advised to take Ibuprofen 400 mg tds and instructed to avoid brushing in the surgical site. Patient was asked to use 0.2% chlorhexidine mouthwash twice daily. There were no adverse effects

during the healing period (Fig. 8). After 2 weeks, sutures were removed and wound healing was satisfactory.

Preoperative status, course of operation and postoperative results were recorded and photographed. The results of the therapy were assessed after 1 and 3 months (Fig. 9).

DISCUSSION

Applications of the Er, Cr: YSGG laser in periodontics are multifaceted and include a wide variety of soft and hard tissue applications. Literature reports claim that Er, Cr: YSGG laser is more safe and efficacious compared to other hard and soft tissue lasers.[6,10]

In periodontal grafting procedures, an open palatal wound is inevitable and its healing is associated with extreme pain and postoperative morbidity.

There are many conflicting theories in relation to wound healing postlaser therapy[7-9] but reports of many studies claim comfortable experience with less trauma and postoperative complications as well as less healing time with Er, Cr: YSGG laser. This could be because Er, Cr: YSGG laser does not rely on significant penetration into soft tissues (unlike Nd:YAG) but ablates soft tissue by selectively removing few cell layers at a time.[11] Also, this laser works on a hydrokinetic system where it is well absorbed by water, therefore causing very less thermal damage to target tissues and results in less pain and discomfort to patients post surgery during wound healing.[12]

In this study, the patient's experience as reported by the patient was least traumatic and healing of the palatal wound was observed to be faster than it is after a scalpel surgery.

CONCLUSION

Although lasers are extremely useful therapeutic tools, there are not without risk. Lasers differ from conventional mechanical tools in that lasers exert their effect in both contact and noncontact mode. We must be aware of the possible risks and must exercise precaution to minimize these risks. Special care has to be taken to prevent accidental irradiation the eyes. Doctors, patients as well as assisting staff must wear protective goggles and all parties should avoid irradiation of reflective surfaces, such as metallic crowns and dental mirrors.

Though no laser system is capable of completely replacing conventional mechanical instruments, they do play an important role in reducing postoperative discomfort to the patient with improved clinical results. However, additional studies are necessary to precisely understand the laser light's biological effects and mechanism of action. Based on the concept of evidence-based medicine, more comparative clinical studies should be conducted to clarify the effectiveness and outcomes of laser periodontal therapy and to support its application in clinical practice.

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Fig. 1: Preoperative with 3 mm recession in 31

Fig. 4: Graft harvesting with laser

Fig. 2: Marking the recipient site with laser

Fig. 5: Harvested graft

Fig. 3: Preparation of the recipient site

Fig. 6: Donor site after harvesting the graft

Fig. 7: Graft sutured

Fig. 8: Forty-eight hours postoperative of the donor site

Fig. 9: Three months postoperative