Lase to amaze

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_Today's patients expect restorations that are both functional and aesthetic. Unlike yesteryear's, today's patients have better knowledge of the advanced materials available and state-of-art equipment. Consequently, they have high expectations when designing their smile and other procedures to achieve optimum results. The specialist's main aim is to achieve complete oral rehabilitation in the most conservative manner.

When choosing a treatment option, dentists and technicians must satisfy both the clinical criteria and the patient's expectations. To design the optimal outcome for a patient during aesthetic enhancement, the dentist must seek to create a symmetrical and harmonious relationship between the lips, gingival architecture and the positions of the natural dentition.

_Case report

A 27-year-old patient visited our practice with the chief complaint of attrition in the lower front teeth and generalised discoloration of all the teeth. He also complained of reduced visibility of the lower anterior teeth along with blackish discoloration of the gingiva.

Examination and treatment plan

Clinical examination revealed attrition of the lower anteriors up to the level of the middle third of the coronal tooth structure in relation to teeth #31, 32, 41 and 42. All the teeth were discoloured and extrinsic stains due to the patient's seven-year history of tobacco chewing (as reported by the patient) were present. Overall gingival asymmetry was observed. Generalised pigmentation of the gingiva was also observed (Figs. 1, 2). It was decided to treat the patient in four phases.

Phase 1: Preliminary phase

Impressions were taken and study models were prepared. An OPG was taken. Oral prophylaxis was done. The patient was recalled after two days for further treatment.

Phase 2: Surgical phase

The second phase entailed a laser-assisted gingivectomy and laser-assisted endodontic sterilisation.

Gingivectomy

Lasers offer increased operator control and minimal collateral tissue damage. The fine tip of the diode laser can be manipulated easily to create the gingival margin contours required to perform the aesthetic crown-lengthening procedure. The surgical site was anaesthetised and the biological width was determined. A 980 nm diode laser with a 400 µ cable was used for the surgical procedure. The amount of gingival tissue to be incised was outlined. Initial incision for the laser-assisted gingivectomy was similar to that of using a blade with an external bevel approach. The distance of the incision from the coronal marginal gingiva is based on the pocket depth and the amount of attached gingiva. The gingival chamfer is achieved and the initial cut is made slightly apical to the pocket depth measurement. A slow, unidirectional hand motion is used, moving the tip at an external bevel towards the tooth structure. Caution is necessary, especially near the root structure, because of a possible laser–hard tissue interaction, which could harm the tissue. During the course of surgery, care was taken to maintain the biological width and to preserve the attached gingiva (Figs. 3, 4, 5). The access cavity was prepared according to the traditional method. The rotary instruments were used along with the ProTaper files for cleaning and shaping the root canals.

Fig. 1 & 2_Initial clinical examination showing attrition and depigmentation of the mandibular anteriors.
Fig. 3_Immediately post operative.


Fig. 1


Fig. 2


Fig. 3


Fig. 4


Fig. 5


Fig. 6


Fig. 7


Fig. 8

Fig. 4_One week post operative.
Fig. 5_Laser assisted sterilization of the root canals in relation to 31, 32, 41 & 42.
Fig. 6 & 7_Laser assisted bleaching.
Fig. 8_Post operative intraoral view.

Sterilisation

A 980 nm diode laser with a 200 µcable was used for sterilisation of the canals along with regular chemical disinfectants. The advantage of laser sterilisation to a conventional irrigant regime to provide sterilisation is that while irrigating solutions have a limited depth of penetration, the laser beam transmitted through the tip of a fibre is emitted in a lateral direction and has an effective penetration depth of more than 1,000 µm. This was followed by obturation and coronal access restoration with composites. The patient was recalled after one week for further treatment.

Phase 3: Aesthetic phase

The third phase entailed laser-assisted depigmentation and laser-assisted bleaching.

Depigmentation

The diode laser was used at 2 W, continuous wave in a defocused mode. This causes a reduced depth of penetration, ablating only the superficial epithelium, which primarily contains the melanin pigments, leaving behind a carbonised layer. Only a surface anaesthetic spray was used for this procedure.

Bleaching

Laser light has the unique property of being absorbed by the chromospheres. These emulsions can be added to the bleaching gel, which are capable of absorbing laser energy and thus inducing and promoting a fast, safe and effective reaction. Cheek and tongue retractors were positioned and a dry operatory was maintained. The gingival protection material was applied along the margin of the gingival covering approximately 1 mm from the tooth surface in the cervical region. The bleaching gel was applied to teeth #11, 21, 12 and 22. Each tooth was then irradiated for 30 seconds in the same sequence, constantly moving the tip of the laser, so that the laser energy was not directed at one place (at 1 W). Fluoride gel was applied to each tooth and irradiated with the laser for 15 seconds to provide resistance to acid attacks on enamel and dentine. The patient was recalled after two weeks.

Phase 4: Prosthetic phase

Crown preparation of teeth #42, 41, 32 and 31 was done. Elastomeric impressions were taken. Bite registration records were taken and the appropriate shade was sent to the laboratory for the fabrication of the crowns. Temporary restorations were fabricated using temporisation material. The patient was recalled after six days for the cementation of the crowns. Excess cement was removed, the occlusion was adjusted and contours were checked.

Inference

The final result showed that the definitive restorations and the soft-tissue procedures had restored the normal form, function and harmony of the oral cavity, while keeping the patient's functional and aesthetic concerns in mind.

_Conclusion

Dental lasers promote patient compliance through the non-invasive nature of treatment, faster recovery time and reduced post-operative discomfort. The use of laser reduces chairside time and improves operator efficiency and thereby reduces fatigue._

_contact laser

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