Laser ridge preservation

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Fig. 1


Fig. 2


Fig. 3

Fig. 1_Condition after extraction.
Fig. 2_Launch of glass rod from laser.
Fig. 3_Membranisation.

_Abstract

The following article describes an alternative treatment option to reduce bone resorption post-tooth extraction with the help of laser technology and autologous materials, thereby creating the optimal conditions for implantation.

Many prosthodontic dentists are familiar with the problem of the crucial buccal lamella being partially or completely resorbed within six weeks post-tooth extraction. This resorption then leads to subsequent implantation problems. Treatment of insufficient bone is attempted via expensive and cumbersome bone augmentation procedures either during or before implantation. Numerous procedures have already been introduced to prevent this bone resorption: from direct implantation to filling the alveole with materials of different origins and frequently additional membranes to cover the introduced material.

This costly bone graft procedure, usually using foreign materials, can unfortunately lead to unforeseeable results, ranging from very good to very poor. Aside from the often-mentioned risks related to bone substitutes of human or animal origin, it is very disagreeable to find non-osseointegrated bone replacement material instead of the desired newly formed bone during implantation and being worse off than without the procedure. Amongst some surgical colleagues, the phrase "party crasher"[1] is used, i.e. the bone formation party fails to happen. Unfortunately, even immediate implantation, which would help in most cases, is often no solution, because infection, insufficient treatment time, unsuited implant systems, and especially the legally uninformed patient are obstacles to an immediate implantation. Even if immediate implantation is a success, the results are not reliably predictable, especially with regard to aesthetics. For these reasons, I searched for an alternative, affordable, fast and non-cumbersome procedure using autologous materials to reduce bone resorption

Fig. 4_Elap-rp membrane.
Fig. 5_Situation after three days.
Fig. 6_Recall after four weeks.


Fig. 4


Fig. 5


Fig. 6


Fig. 7


Fig. 8


Fig. 9


Fig. 10

Fig. 7_Four weeks after elap-rp.
Fig. 8_Six weeks after elap-rp.
Fig. 9_Directly after x and elap-rp.
Fig. 10_Situation after twelve weeks.

and create optimal conditions for subsequent implantation. This procedure, elap-rp (elexxion laser-assisted protocol-ridge preservation), will be presented in this article.

_Theoretical reflections

Romanos[2] demonstrated in his study with a high-performance Nd:YAG laser that a laser cut heals distinctly slower than a scalpel cut, but therefore scar free. After three weeks, at the earliest, the laser cut is completely healed. It is assumed that thermal damage to the external epithelial layer slows the healing process. This undesired result occurs with every thermal laser and therefore with an undesired, related tissue carbonation.

_Effectively slowing healing

The effect described is of use to the experienced laser operator during de-epithelialisation of movable mucomembranes for controlled reproduction of attached gingiva. The de-epithelialisation area acts as the barrier that slows the healing process. In brief, the area treated with the high-performance laser acts as a natural, resorbable, highly effective membrane with all known and desired effects. The way in which the laser-created autologous membrane can be optimally used for ridge preservation will be illustrated later. The second important factor for optimal bone regeneration is blood, as already conclusively presented and practised by Schulte[3] with autologous blood coagulum of cysts. If the vestibular lamella can be retained during tooth removal, when compared to a hexagonal cube, it is about a defect in five of the sides and a missing "lid". This can be compared to a cyst defect; the sole difference being that no primary wound closure can be achieved without otherwise unnecessary additional surgical intervention.

_Retaining vestibular lamella

Accompanying the elap-rp procedure, a whole bleeding of the alveole is absolutely necessary post-extraction (Fig. 1). The bleeding can be achieved conventionally via alveole planing or preferably via laser application. Generally, a claros soft laser (elexxion) in the healing programme with a pulse of 75 mW with 8,000 Hz for 120 seconds or with 100 mW for 60 seconds, i.e. approx. 6 J per alveole, is sufficient in such cases. The T4 soft laser glass rod should be inserted to the base of the alveole and all exposed bone surfaces should be collected on a grid without contact (Fig. 2). Sometimes, a second or third procedure is necessary, and of course possible, to achieve sufficient bleeding.

The alveole filled with blood is then membranised (Fig. 3) grid-wise with the claros in the haemostasis programme with 30 W with 20,000 Hz and a pulse duration of 10 seconds with the non-initialised 600 fibre, beginning distally at an unfocused distance of 1 to 2 mm (Fig. 3). This procedure initially requires some practice, but is then simple, fast and reproducibly successful. Afterwards, the patient leaves the clinic with instructions not to brush or rinse too thoroughly (Fig. 4). The three-day (Fig. 5) and four-week (Fig. 6) follow-ups of a different case showed a successful, almost complete retention of the vestibular lamella. In the following illustrative examples (Figs. 7–10), further results are shown that were also achieved with this new, systematic elap-rp procedure. Please note the almost completely retained vestibular lamella that invites each implant surgeon to a simple and safe implantation at a prosthetically sensible location. With the elap-rp procedure, ideal conditions for implantation or an ovate pontic can be created quickly and affordably without additional material costs. Use it to offer you patients an optimal and affordable laser treatment._

Editorial note: A list of references is available from the publisher.

_contact laser

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