

GTR and recession coverage in immediate implantation

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Fig. 1



Fig. 2



Fig. 3

Fig. 1_Initial situation.

Fig. 2_Preoperative panoramic radiograph.

Fig. 3_Tooth 11 post-op.

_Introduction

Among the difficulties and challenges in immediate implantation, local inflammations of the hard or soft tissue are major criteria on how we implant. The behaviour after implantation, especially of the soft tissue, is only predictable when the diagnosis and the treatment concept are correct. Gum recessions are potential contra-indications for immediate implant placement.

Nevertheless, we have to take into consideration that soft tissue and recession coverage techniques function differently when applied to implants. A calculated risk is acceptable if the procedure prevents soft and hard tissue from absorbing, which can lead to compromised aesthetics and an unsatisfied patient.

_Clinical and radiological findings

The patient visited the practice complaining about compromised aesthetics of the anterior maxilla. The first examination showed a challenging situation of teeth 11 and 22. In the past years, the almost 30-year-old patient had experienced the whole range of dentistry, including endodontology, periodontology, and surgical crown extension.

Teeth 11 and 22 were insufficiently restored, with tooth 11 showing a soft tissue recession Miller class 2 and tooth 22 showing an apical inflammation. Bleeding on probing was positive in 11 (grade 4), so were percussion and mobility in 22. The crown in tooth 11 was overextended, probably to cover recession. Crown 22 was also overextended, leading to secondary caries. The periodontal screening index on 11 was grade 3 with



Fig. 4



Fig. 5

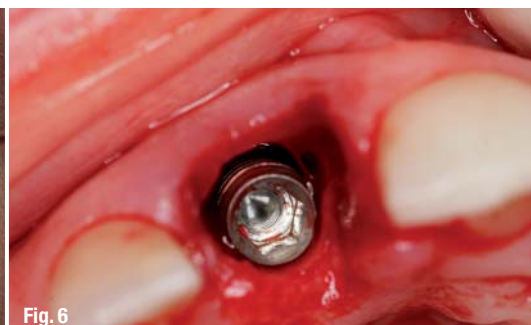


Fig. 6

Fig. 4_Tooth 22 post-op.

Fig. 5_Implant insertion tooth 11.

Fig. 6_Implant inserted in tooth 11.

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Fig. 7_Provisional crown and GTR.

Fig. 8_Tooth 11 post-op.

Fig. 9_Tooth 22 post-op.

Fig. 10_Three weeks post-op.

Fig. 11_Provisional crown on the modell.

Fig. 12_Veneers, biscuit bake.

Fig. 13_Completed provisional crown and veneers.

Fig. 14_Four weeks after re-entry.

Fig. 15_Try-in of zirconium abutment 11.

Fig. 16_Try-in of zirconium abutment 22.

Fig. 17_Zirconium caps in occlusion.

Fig. 18_Tissue quality four weeks after provisional placement.

Fig. 19_Provisional crown tooth 22 after re-entry.

Fig. 20_Provisional crown tooth 11 after re-entry.

Fig. 21_Veneers and provisional crown placed after re-entry.

Fig. 22_Try-in of abutment tooth 11.

Fig. 23_Try in of abutment tooth 22.

Fig. 24_Abutments and completed crowns.

3.5 mm mesially and 4.0 mm distally. The radiological control (Figs. 1–4) also shows a discrepancy between preparation and crown modelling in tooth 11. This artificial undercut and the minimized biological width were the main reasons for the local inflammation.

Planning

Teeth 11 and 22 were to be extracted. A new crown on 11 would not offer any better aesthetic and functional results. Due to the root screw, the root treatment on 22 was risky and its result was unpredictable. Larger composite fillings on 12 and 21 compromised aesthetics additionally.^{2–5}

The treatment plan included the following steps:

1. Extraction of teeth 11 and 22 with immediate implantation and guided bone and tissue regeneration.
2. Maryland Bridge as a temporary restoration.
3. Veneers on teeth 12 and 21 after implant re-entry.
4. Full ceramic crowns on teeth 11 and 22.

Surgical phase

After extraction of teeth 11 and 22, the ridge was cleaned and disinfected. No injury or perforation of the buccal lamella was observed. The implant system used was tapered, with platform switching and high primary stability. The drill sequence was followed as provided by the manufacturer but with no irrigation and a low rotation of 50 to 70 rpm with maximum torque.^{10–14}

Implants were placed slightly subcrestally so that the apical coronal position was 0.5 mm below bone level. In region 11, a 4.1 x 13 mm implant was inserted (Figs. 5–8) and an implant of 4.1 x 10 mm in region 22 (Fig. 9).^{6–8} The gap to the buccal plate of 1 mm was augmented with a mix of β -TCP and HA 40%–60%.^{9,15} No effort was made to manipulate the soft tissue recession or raise a flap. Cuts in this region would have led to major recessions because of the periodontal situation of the neighbouring teeth. For this reason, the recession in tooth 11 was left as it was. The crestal part of the extraction socket was covered with collagen tissue fleece. At last, a piece of dermis matrix was positioned crestally and slightly buccally to improve soft tissue quantity after healing.^{16–19}

The provisional Maryland Bridge was manufactured with pontics on 11 and 22 for optimal soft tissue management (Figs. 10–13). Recall appointments were kept for one, three, seven, 14, 21 and 30 days and afterwards monthly.

Provisional and healing phase

At four weeks postoperatively, the bridge was removed and teeth 12 and 21 were prepared to receive veneers. The soft tissue condition was optimal, without inflammation and with full epithelialisation of the wound. With a new temporary restoration, we forwarded soft tissue conditioning. Radiological controls were made after each cementation procedure to preclude cement rests and a risk of periimplantitis. Veneers were inserted before loading the implant for better colour adaptation of the supra-construction, but also after implant re-entry for an optimal emergence profile planning.

Implant re-entry

The re-entry was performed three months postoperatively with a simple mucoperiosteal flap. The quality of the soft tissue was good so that a small crestal cut of 4 mm was enough to remove the healing screw. Instead of inserting a gingival former, we decided for a temporary abutment with a composite crown, resulting in a screw-retained provisional. No risk of cement rests was taken and the screw-retained temporary crown enabled us to manipulate soft tissue as desired for an excellent aesthetic outcome. The patient received this temporarily for four weeks and afterwards impressions were taken.

Restorative phase

The veneers were retained four weeks after implant re-entry (Figs. 13 & 14, 19–21). At this time, we had optimal conditions for colour selection and impression of the implants with customised implant copies. At the first abutment try-in (Figs. 15–18, 22 & 23) we could see the soft tissue regeneration and forming around the zircon caps. Even the gingival surface texturing is evident.

Fig. 25 Crowns completed.

Fig. 26 Check-up of teeth 11 and 22 and crowns.

Fig. 27 Three months after insertion of crowns.



Fig. 25



Fig. 26



Fig. 27

Fig. 28_Occlusion.

Fig. 29_Left.

Fig. 30_Right.

Fig. 31_Smile.



The correct abutment and crown insertion (Figs. 24 & 25) were controlled with X-rays (Fig. 26). Not only did the surgical part lead to such highly aesthetic results, but also the technical part played a crucial role in the aesthetic outcome (Figs. 27–31). The soft tissue situation showed a slight improvement of the papilla on tooth 11 four weeks after loading.

Discussion

The decision to extract the teeth and place implants immediately is always a risk. This risk is lowered if we understand why the tooth had to be removed, how biology works and what we can or must not do. In this case, a flap raise or papilla raise would have been fatal with regard to aesthetics, resulting in unpredictable and major defects. The implant position slightly beneath the crestal bone level is correct, calculating the inevitable loss of crestal height through the former local inflammation. The grafting of the buccal plate gap is also appropriate and leads to a higher predictability when performed with a combination of fast and slow, or slow and non-resorbable biomaterials.

Platform switching is a useful technique to offer soft tissue or hard tissue space to grow and a stable scaffold for support. When the system offers real platform switching, as seen here, hard tissue growing on the reversely bevelled implant neck prevents crestal bone resorption. Especially soft tissue growing and covering the implant neck will form a tissue ring around it, protecting the crestal bone from resorption as well. Prosthetics are as important as the surgical part. They encompass the final restoration with the emergence profile, the proximal contact and margin design, but the temporary restoration also is crucial for soft tissue

maintenance, management and long-term stability. As can be seen from the recall photos four weeks after loading, the soft tissue fills the proximal gaps if the conditions for it are fulfilled. The initial recession is gone and we created enough soft tissue for good aesthetic results. The tight interdisciplinary collaboration between surgeon, technician and restorative dentist finally guaranteed a satisfactory result and a happy patient.²⁰⁻²⁵

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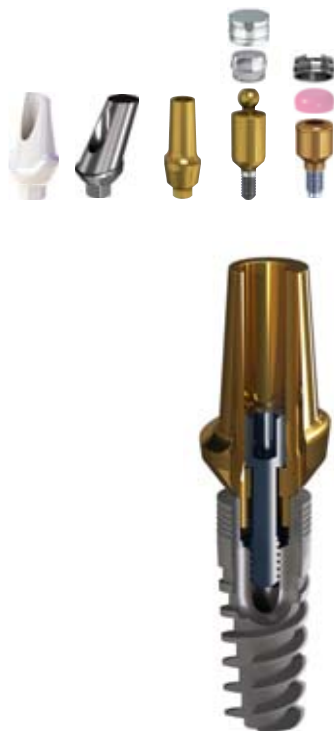
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