Replacement of an upper central incisor with a Bone Level implant and GBR technique

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History:

A 59-year old woman attended the author's practice because of an idiopathic external root granuloma on tooth 11. She is a non smoker with high blood pressure treated medically, otherwise in good general health.

Procedure

The root granuloma on the distal side of the root of tooth 11 is clearly visible on the X-ray (Fig.1). Conservative treatment of the granulomatous tooth was undertaken, with surgical opening of a flap and ostectomy (14.12.2006). After raising a flap from 13 to 23 the defect was exposed, the zone was then isolated using rubber dam and the cavity was tightly obturated with composite (Fig.2).

Six weeks later the patient attended again. The gingiva in the anterior maxillary region was inflamed. Tooth 11 was tender on percussion and reacted very strongly to the CO_2 cold test. It can be seen radiographically that the root granuloma had recurred and reached the pulp (Fig.3), where upon severe pulpitis developed. Extraction was thus the treatment of choice.

On the extracted tooth, the pulp can be clearly seen to be lying free in the idiopathic cavity (Fig.4). The patient was provided with are mov-able temporary partial prosthesis (25.01.2007).

Preoperative planning was carried out using the radiograph and a reference sphere (Ø 5mm) (Fig.5).

14 weeks after the extraction, the Straumann® Bone Level

Figure 1: Root granuloma on the distal side of the root of tooth 11.

Figure 2: Exposed defect after the conservative treatment of the granuloma.

Figure 4: E xposed pulp visible in the idiopathic cavity.

Figure 3: Recurrent external root granuloma.

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Figure 5: Preoperative planning with reference sphere.

Figure 6: Implant insertion.

Figure 7: Situation after GBR and wound closure.

Figure 8: Radiograph after implant insertion.

Figure 9: Removal of sutures 7 days after implantation.

Figure 10: Exposure of the implant by means of a U-shaped incision 16 weeks after implantation.

Implant (RC,Ø 4.1mm, SLActive 12mm) was placed (2.5.2007). A mucoperiosteal flap was made with a vertical relieving incision mesial to 13. The implant bed and thread were prepared with the Straumann® Bone Level (BL) profile drill (short, Ø 4.1mm, length 26mm) and the Straumann® BL/TE thread tap for adapter (Ø 4.1mm, length 23mm). The vestibular compact bone in region 11 was freshened for the planned bone regenera-tion. When inserting the implant, it should be ensured that the reference mark on the implant carrier is aligned in a labialoral direction (Fig.6). The implant is closed with a flat Straumann® Regular Connection (RC) closing screw (height 0mm). GBR was carried out using bone chips from the nasal spine and a bone filter and an absorbable collagen membrane. The graft was covered with four to five layers of the collagen membrane in order to replace the missing crestal tissue. Healing in this zone was by second intention (Fig.7). Submerged implant healing took place, omit-ting flap advancement in order to avoid a shift of the gingival contour. After implant insertion, an X-ray was taken (Fig.8), the temporary restoration was relieved and the patient was instructed.

Healing was uncomplicated and thes utures were removed 7 days after the surgery (Fig.9).

16 weeks after implantation, the site was reopened (22.8.2007). So as not to lose the keratinised mucosa, a u-shaped incision was made and the labially pedicled flap was reflected in the vestibular direction so that spontaneous remodeling could be expected (Figs.10,11).

2 weeks after reopening (5.9.2007), the final impression was taken in the conventional open tray technique with a Straumann® RC impression post (for open tray, with guide screw) and a polyether impression material (Impregum®, 3MEspe).

In the dental laboratory, an anatomical Straumann® abutment (RC, angled 15°, gingiva height 2mm) was chosen and adapted roughly. With a customized plastic transfer

Figure 11: Mobilized pedicled flap placed in front of the healing screw.

Figure 12: Insertion of the abutment using a customized transfer template.

Figure 13: Slightly customized abutment for evaluation of shape insitu.

template, the abutment was placed in the correct position (Fig.12) and the form and cervical contour were evaluated insitu. In the present case, the cervical margin had to be lowered by about 0.8mm in the apical direction so that the sub-sequent crown margin would be submucosal (Fig.13). At the same session, the dental technician selected the shade of the restoration. The bisque-bake try-ins were performed in the standard manner.

The customized abutment was inserted with 35 Ncm and sealed with a light-curing temporary filler (Fermit, by Vivadent (Fig.14). The porcelain-fused-to-metal crown with vestibular ceramic shoulder (Fig.15) was fixed with glass ionomer cement (Figs.16,17), contacts were checked in intercuspidation and the functions were tested finally in laterotrusion and protrusion. The final radiograph shows very clearly the stable bone margin around the implant shoulder (Fig.18).

Treatment result

18 weeks after placement of the restoration (13.2.2008) it can be seen very clearly that the gingiva has been remodeled highly satisfactorily around the neck of the crown. The resulting appearance is very natural (Figs.19,20).

Conclusions

The use of Straumann® Bone Level implants is as easy as with the standard system (Straumann® Soft Tissue Level Implant), and the surgical instruments and procedures even remain the same. At the time of the treatment (2007) a Straumann® ceramic abutment for the Straumann® Bone Level implant was not yet available[1]. Using customized ceramic abutments and

Figure 14: Screw channel sealed with light-curing temporary filler.

Figure 15: Metal ceramic crown with vestibular ceramic shoulder.

Figure 16: Final crown insitu.

Figure 17: Final crown insitu, close-up.

Figure 18: Final radiograph.

all-ceramic crowns will have an even more positive effect on the esthetics. The use of Bone Level implants appears rational in the esthetic region, especially with implanta-tions involving simultaneous GBR.

[1] The individualized Straumann® RC Ceramic Abutment (for Straumann® Bone Level implants) has been available since October2007.

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Figure 19, 20: Esthetic and natural-looking final result, 18 weeks after implant insertion.