Case report: Replacement of failing 2 stage implants by basal implants and conventional bridgework

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Abstract

This article describes the treatment steps to resolve a case of conventional dental implant failure with the help of basal implants and conventional bridges. By utilizing the remaining corticals (lingual, vestibular, basal) immediate implant treatment was possible, although a large vertical bone groove had been developing due to the failure of three implants on the right mandible of the patient. Due to the usage of basal implant, bone augmentations and healing (waiting-) times were avoided.

Keywords: Implant failure, indications for dental implants, basal implantology, immediate loading.

1. Introduction

A 48 year old female patient, regular smoker (6-10 cigarettes daily), otherwise healthy, requested a 2nd opinion after having wound healing problems in the area where a total of two 2-stage implants had been placed and left for “healing” (Fig. 1). The three implants on the left side had exfoliated recently, later pain appeared under the temporary bridge also in the 3rd quadrant. The patient requested the fast restoration of her masticatory function. Pain and first signs of failure became apparent already a few days after the 2-stage implants were placed.
2. Material and Methods

To resolve the situation in one surgical step, a large flap was opened on the right vestibular side in the lower jaw and the 3rd molar was extracted. On the jaw a large boneless fossa appeared, the length being approximately 2.5 cm and the with being almost 1 cm. In this fossa large amounts of granulation tissue were found and ex-cochleated or drilled out.

Using a 1.6 mmd vertical cutter for high speed turbine the vertical slot for a lateral basal implant was prepared. Using 1:1 contra-angle at 40.000 Rpm the horizontal slot was prepared. Then a lateral basal implant BAST 9/16 h6 was inserted in secure bi-cortical manner. This insertion regarded the following aspects:
- the area of the 3rd molar should not be reached/affected.
- The vertical implant shaft should be surrounded by native bone as much as possible.
- The base-plate of the implant would reach through the large defect created by the failed implants.
- The base plate should be placed deep enough inside the mandibular bone in a resorption stable area.

In the area of the premolars of the lower right jaw two BCS implants (20mm and 23mm) were inserted. This insertion regarded the following aspects:
- both implants should be positioned anteriorly to the mental nerve
- both implants should reach a rigid fixation in the basal bone
- parts of the vertical shafts were going right through the large bony defect.

The flap was closed with 3.0 Silk-suture. In order to cover the bony defect, a flap-elongation procedure had to be carried through. The flap was mainly secured by flipping it over the implant heads.

Right after the surgical intervention an impression was taken using the impression caps for BOI- and BCS- system and precision silicone around the teeth. Great care was taken not to dislocate flow-able impression material into the bone defect in the left lower mandible.

During the whole intervention care was taken to regularly rinse the bone and soft tissues with Betadine solution 5%.

As postoperative prophylactic treatment, the patient was advised to rinse her mouth twice daily for 7 days with Povidone-iodine solution 5%.

Patient was advised and instructed, to perform anterior and lateral neck and facial lymph drainage, in order to allow early reduction of postoperative swelling of the cheeks, and to avoid tension in the area of the sutures after the operation.

3. Results

On the first postoperative day the sutures were removed and metal try-in in was performed.

On the second postoperative day the inter-maxillary relationship was controlled on the ceramics and adjustments were made.

On the third postoperative day the final prosthetic work-piece, a circular metal-to-ceramic bridge, was inserted and permanently fixed with Fuji Plus cement.

Symmetrical masticatory surfaces (regarding length and width) from 6-6 were give to the patient, no contact was realized on the teeth 37 and 38. No contacts were realized in the front
between the cusps of the canines as well. This way a true lateral group function was created, with a symmetrical AFMP.

The patient was called for checkup one week later. Minor occlusal adjustments were necessary, some excess cement was identified and removed. Already at that stage of treatment the patient reported no pain or discomfort during function, nor any phonetic issues. Three weeks later a bone sequester 1.5x0.5 cm. come out of the lingual side in the right area, where recently the three two-stage implants had exfoliated.

Five weeks after the surgery the patient came to the next routine examination. The soft tissue, appeared fully healed, light pink, with no signs of any inflammation. The tissue and area around the implants was clean and accessible for the patients routine prophylactic measures. All important areas were easy to reach for her cleaning and for self-cleaning by the tongue.

4. Discussion

4.1. Discussion of the previous treatment.

In general the treatment with 2-stage-implants is considered to be successful, if enough bone is given (vertical and horizontal bone supply). Nevertheless all (100%) of the Bredent implants failed in this case. This calls for a thorough discussion of the reasons for failure.

Implant failures are multi-causal, with infections being the predominant causes of early failure. In the case discussed here, the gaps between the teeth were bridged with acrylic temporaries and these temporaries had a broad-based contact with the gingiva. On the left side after removing the temporary we saw openings of the mucosa with pus and augmentation material coming out. So we assume that the augmentation material became infected and the sutures did not remain closed. This may be due to the patient’s regular nikotin abuse. It would have been more advisable to leave the implanted sites without any teeth during the time of healing. This would have been possible easily, because the patient had enough teeth for a reduced but effective mastication. Especially closing the gap in the 3rd quadrant with a fixed temporary under mucosal contact was in our view risky and unnecessary.

In addition the case presented periodontal involvement, i.e. numerous teeth (i.e., the molars in the 3rd quadrant) had pockets and the periodontal infection seems not to have been under control at the time of implant placement. In such a situation it is more likely that the implant site gets infected. Administering oral antibiotics peri-operatively does not reduce the danger of infection, as the effectiveness of this treatment cannot be controlled, and areas under pus contamination are anyway not reached by this treatment.

Administering oral antibiotics may keep doctors and patients in a false feeling of security and it may prevent that really necessary steps for infection prevention are taken.

When taking out the 2-stage implants we found non-integrated artificial bone augmentation material. This material had presumably caught infection due to problems with the wound closure. As the alveolar ridge had been wide and also enough vertical bone was present pre-operatively. So the question must be raised, why such material was used in the first place, especially in a smoking patient. It is known that smokers do not have problems with the implant integration, - the only real issues which are observed in this group of patients are problems with wound closure (i.e. dehiscences). In our view such patients should as a rule be treated in a flapless procedure and (hence) without augmentation.
4.2. Discussion of our revision/treatment

If several crestal implant fail in a row, and bone loss areas get connected, a large sagittal groove in the center of the lower jaw bone may develop. Such a situation was observed in both sides of the lower jaw. In such cases nevertheless healthy corticals and other mineralized bone areals are available and accessible. We decided to use the stable basal bone anterior to the mandibular nerve in the right side of the lower jaw for anchoring two BCS implants. In the area of tooth 46/47 a lateral basal implant was inserted, thereby utilizing the lingual and vestibular cortical of the mandible. We also tried to engage the vertical part of the BAST implant as much as possible into the available bone. The base plate was in its medial part passing through the sagittal bone grove and it was visible form the top.

This case shows, that with various designs of basal implants (crestal or lateral implants) even in quite hopeless situations a satisfactory clinical result can be achieved without the need of any augmentation. If this case would have been treated with another set of crestal 2-stage implants, a lengthy healing time and presumably again bone augmentation would have been necessary.

Conclusion

Treatment with single-stage basal implants (i.e. BOI & BCS) is the method of first choice when after failure of crestal 2-stage implants and subsequent per-implant bone loss a second dental implant treatment is requested. Likewise treatment with single-stage basal implants is the method of first choice for smokers if an alternative treatment would require raising a flap or if it would include bone augmentation.
Fig. 1: Postoperative radiograph after placement of 5 Bredent dental implants in the mandible. As all teeth were prepared for crowns, a temporary bridge was cemented from tooth 43 to tooth 38 to allow mastication.

Fig. 2: A month later all implants in the lower right jaw were lost and large radiolucent areas around the two meaning implants were visible.
Fig. 3: Circular bridge on teeth and 3 basal implants with adjusted chewing surfaces from 6-6. The wisdom tooth in are 48 had been removed in the same intervention.