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Case Report: Re-Implantation Using Strategic Implants after Multiple Dental Implant Loss

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Abstract: ***This article describes the treatment steps to resolve a case of conventional dental implant failure with the help of strategic implants and fixed prosthesis. By utilizing the remaining cortical bone, immediate implant treatment is possible, although a large vertical bone groove has been developed due to the failure of conventional implants on the right mandible of the patient, bone augmentations and long healing (waiting) times can be avoided by the strategic implant with immediate loading.***

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

1. Introduction

A 48 year old female, smoker, with healthy medical history, requested an opinion after having post-operative complication in the area where a total of five conventional implants had been placed in the mandible and left for healing. All teeth were prepared for crowns and a temporary bridge was cemented from tooth 48 to tooth 38 to allow mastication. (Fig. 1).

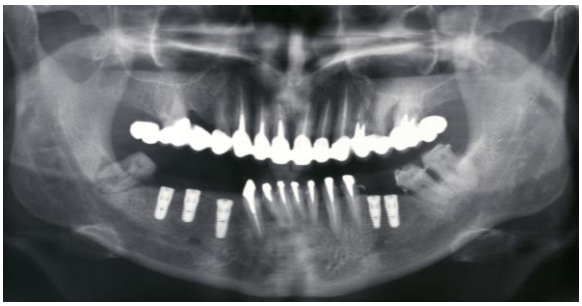

Figure 1: Post-operative radiograph after placement of five dental implants in the mandible.

The three implants on the lower right side had exfoliated recently; later pain appeared under the temporary bridge also in the lower left side. The patient requested the fast restoration of her masticatory function. Pain and signs of failure became apparent already a few days after the conventional implants were placed (Fig. 2).

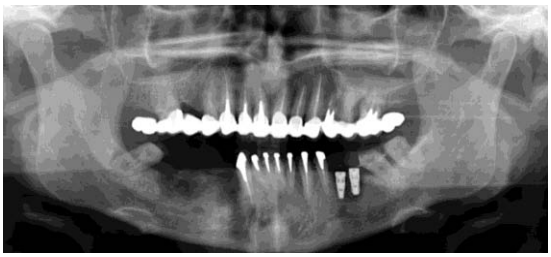

Figure 2: A month later all implants in the lower right jaw were lost and large radiolucent areas around the two remaining implants were visible.

2. Material and Methods

To resolve the situation in one surgical step, a mucoperiosteal flap is elevated on the right vestibular side in the lower jaw and the wisdom tooth (48) is extracted. All the granulated tissue in the area of exfoliated implants is removed leaving a large, empty fossa inside the mandible.

Using a 1.6 mm diameter vertical cutter for high-speed turbine, the vertical slot for a lateral strategic implant is prepared. With a (blue) 1:1 contra-angle at 40.000 rpm the horizontal slot is prepared with sufficient irrigation of ringer lactate. Then a lateral strategic implant BAST 9/16 h6 is inserted in secure bi-cortical manner (1). This insertion affects the following aspects:

- The area of the (48) should not be reached by the vertical slot. 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 in the mandible created by the failed implants.
- The base plate should be placed deep enough inside the mandibular bone in a resorption stable area, taking into consideration that some vertical bone loss might occur.
- In the area of the premolars of the lower right jaw two strategic implants (BCS 3.5 mm diameter, 20mm and 23mm length) are inserted (1). This insertion is done under the following aspects:
- The load transmitting areas of booth implants should be positioned anteriorly to the mental foramen.
- Both implants should reach a rigid fixation in mineralized, strategic bone.
- Parts of the vertical shafts of these implants are going right through the large bony defect.

The flap is closed with 3/0 surgical suture (Silk). In order to cover the bony defect, a flap-elongation procedure had to be carried through. The flap is mainly secured by flipping it over the implant heads and thereby tensions on the sutures are avoided completely.

Right after the surgical intervention an impression is taken using the impression caps for BOI- and BCS- system and regular consistency addition silicone impression materials injected around the prepared teeth and the impression cups. Care is taken not to inject impression material into the bone defect in the left lower mandible. A bite registration material is used to record the centric jaws relation. As post-operative prophylactic treatment, the patient is advised to rinse her mouth twice daily for 7 days with Povidone-iodine solution 5%, also to perform anterior, lateral neck and facial lymph drainage, in order to allow early reduction of post-operative swelling of the cheeks, and to avoid tension in the area of the sutures after the operation(2).

3. Results

On the first post-operative day the sutures are removed and metal try-in was performed. On the second post-operative day the inter-maxillary relationship is controlled on the ceramics and adjustments are made. On the third post-operative day the final porcelain fused to metal fixed prosthesis is cemented permanently with Fuji Plus cement.

Symmetrical masticatory surfaces (regarding length and width) from 36 to 46 are given to the patient; no contacts were installed on the teeth 37 and 38. Also no contacts are realized in the lower incisor teeth. This way a true lateral group function was created, with a bilateral symmetrical AFMP (1).

The patient is called for check-up one week later. Minor occlusal adjustments are necessary; some excess cement is identified and removed. At this stage of treatment the patient reported no pain or discomfort during function, or any phonetic issues (Fig. 3).

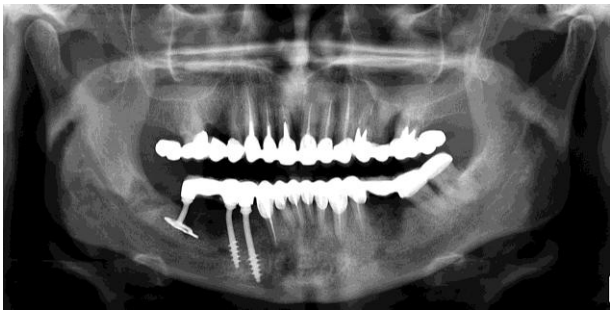

Figure 2: Fixed prosthesis on teeth and 3 Strategic Implants with adjusted chewing surfaces from 36 to 46. The wisdom tooth in area 48 is removed in the same intervention.

Five weeks after the surgery the patient came to the next routine examination. The soft tissue appeared fully healed, with no signs of any inflammation. The tissue and area around the implants is clean and accessible for the patient's routine prophylactic measures.

4. Discussion

4.1 Discussion of the previous treatment

In general the treatment with conventional implant is considered to be successful, if enough bone is given (vertical and horizontal bone). Nevertheless all the 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 saddle shaped pontics. After removing the temporary bridge we saw the openings of the mucosa with pus and augmentation material coming out. Therefore we assume that the augmentation material became infected and the sutures did not remain closed. This complication may be owing to the patient's regular nicotine abuse. It could have been more advisable to leave the implanted sites without any temporary prosthesis during the time of healing. This could have been easily possible, because the patient had enough teeth for a reduced but effective mastication. Inserting such kind of temporary prosthesis (so early) in our view is risky and unnecessary.

In addition the case presented with 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 pre-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 necessary prophylactic steps for prevention of infection.

When taking out the failed 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 with no real reason for the augmentation, especially in a smoking patient. It is known that smokers do not show problems with the implant integration; the only real issues observed in this group of patients are problems with the wound closure. In our view such patients should as a rule is treated in a flapless procedure and without bone augmentation.

4.2 Discussion of our revision/treatment

If several adjacent conventional implants fail in one case, and bone loss areas get connected, a large vertical groove in the center of the lower jaw-bone will develop. Such a situation was observed in both sides of the lower jaw. Only the cortical walls were left, and these walls were without any internal blood supply. The cortical may nevertheless serve as a stable rest for load transmitting areas of dental implants. We decided to use the stable strategic bone anterior to the mandibular nerve in the left side of the lower jaw for anchoring two BCS implants. In the area of tooth 46 and 47 a lateral basal implant was inserted, thereby utilizing the

lingual and vestibular cortical bone of the mandible. We also tried to engage the vertical part of the BAST implant as much as possible into the available crestal bone. The base plate in its medial part passing through the sagittal bone groove and it was visible from the top.

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

5. Conclusion

Treatment with single-stage strategic implants (i.e. BOI & BCS) is the method of first choice when failure of conventional implants and subsequent per-implant bone loss and a second dental implant treatment is requested. Likewise treatment with single-stage (one-piece) strategic 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.

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Author Profile

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