

The immediate post-extractional insertion of screw implants in dental practice

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Summary

This article presents favorable and unfavorable arguments in the use of a screw implant inserted immediately after the extraction of a tooth. There are strong arguments that make this technique the first choice in clinical cases that allow it.

The main disadvantage of this technique is represented by the necessity to eliminate all the granulation tissue present in the extraction site, and this is the reason why the chances of failure are considerably higher than while inserting an implant in a healed bone.

The insertion of an implant in a post extractional alveolus presents a great number of advantages for the patient and for the practitioner as well. Without the support offered by the functional masticatory units (teeth or implants) the alveolus bone passes through a catabolic phase, resulting in atrophy of the alveolus ridge. The changes in the osseous architecture are followed by changes in the position of the soft tissues, making the esthetic result more difficult to achieve.

Another advantage of this technique is the possibility of placement the implant in the same position as the extracted tooth. Even more, the practitioner can place the implant more favorably than the original position of the natural tooth when preparing the implant site. Having the dental alveolus as a guide, the dentist can determine easier the parallelism and alignment of the implant to the remaining teeth or to other implants, depending on the case.

Another interesting detail is the partial conservation of periodontal receptors of the natural tooth, which regain their function after the insertion of the implant. This cannot happen if the implant is inserted after the healing of the bone. The existence of periimplantary receptors has a great importance, because it helps the coordination of masticatory movements, considerably reducing the amount of stress transmitted to the implant-bone interface.

The reduction of the healing process of the soft and bone tissues must also be considered, as it decreases the amount of time the patient waits for the final restoration.

Given these advantages, more and more patients agree to this treatment option.

Considerations regarding the dental extraction when immediately inserting a screw implant

1. Preoperative evaluation. The patient is examined following the regular steps when planning an oral implantology treatment. Still, there are some emergency situations, such as a dental fracture with the exposure of the pulp, which may prevent a thorough investigation.

2. Antibiotherapy. If the preoperative evaluation reveals the presence of infection, antibiotherapy should be started 3-5 days before the intervention.

3. Conservation of the receiving bone. After the reflection of the mucoperiosteal flaps, the tooth has to be extracted as carefully as possible, avoiding any unnecessary maneuvers, which may traumatize the bone. The tooth may be fragile or even anquilosed, especially those with endodontic treatment. These cases require the use of a 700XXL drill to cut the tooth longitudi-

nally, after which the fragments will be removed with care.

4. *Delaying the intervention.* If after extraction puss is revealed in the alveolus, the intervention must be delayed. In some cases this determination cannot be done preoperatively, so it is the doctor's decision to insert the implant at this time or to delay it. The patient must be warned of this possibility in advance. Even more, if puss is revealed, the bone augmentation cannot be performed.

5. *Avoiding excessive pressure.* After the extraction of the tooth or the fractured root, the alveolus is surrounded by a thin cortical bone. This bone layer will be removed during the preparation of the implant site, so that the implant is inserted in bleeding bone. More, the buccal or the oral bone do not have nutritive channels, so in this region the blood supply is defective, and the reflection of the mucoperiosteal flaps in this area lessens even more the blood supply. That is why excessive force during preparation must be avoided, these pressures leading to bone resorption and consecutive failure of the implant due to avascular necrosis.

6. *Improvement of primary stability.* Ideally, the implant must be inserted at least two thirds in the receptive bone. When the bone height permits it, the implant apex must be placed 1-2 mm beyond the tooth apex, to increase the primary implant stability and the crown/root ratio. The diameter of the implant must be as big as possible to prevent proliferation of soft tissue between the implant and the bone in the cervical area. Immediately after insertion, the implant must be totally immobile. If any mobility is observed, the implant must be replaced with another one, of bigger diameter, or the alveolus must be augmented and the intervention delayed 4 months.

7. *Bone grafts.* If the space between the neck of the implant and the bone is larger than 1 mm, the area must be augmented. Larger buccal or oral bone defects should be augmented and protected with a resorbable membrane, stabilized with titanium pins, but only if primary stability of the implant is achieved.

8. *Soft tissue suture.* Primary suture is recommended. If the flaps cannot be connected by suture, a vertical incision is needed.

9. *Bone compactation.* Due to the bone compactation phenomenon, we can increase the density of the bone by using specially created

osteotomes, thus increasing the primary stability of the implant. The osteotomes are used in successive order from low to high diameter; the last diameter used being the one of the implant itself.

Surgical technique

The intervention must be performed under perfect antiseptic conditions, required by oral implantology. The tooth must be extracted as smoothly as possible, removing from the extraction site any signs of granulation tissue (if any doubts, it is better to delay the intervention for 6 weeks). The integrity of the alveolus walls must be thoroughly checked, and the position of the implant must be determined according to the extracted root.

The drilling will be performed beyond the tooth apex, but most cases require a change in the direction of the implant placement, to avoid the perforation of the cortical bone and to make the best of the available bone, this way enhancing the primary stability of the implant.

The diameter of the implant must be adapted to the diameter of the alveolus, and it may even be of a greater value. Some cases require the use of augmentation materials and/or membranes, if there are large bone defects.

Advantages

- a single surgical procedure for the tooth extraction and the implant insertion;
- the postextractional bone resorption is limited or even avoided, thus obtaining a better result, both functionally and aesthetically;
- the possibility of placement of an implant in an area with relatively low bone volume, area in which otherwise (after the postextractional healing) the insertion of an oral implant would not be indicated;
- the drilling through the bone cortical is avoided, this way avoiding the resulting heat;
- perfect choosing for implant placement spot;
- increasing the useful length of the implant - increased contact surface with the bone - leading to better stability;
- placement of the implant in the closest position to the natural tooth - a considerable aesthetic advantage;

- this treatment solution applies to cases of traumatic tooth avulsion;
- the gingiva of the natural tooth is often preserved - essential to the aesthetic result, especially in the frontal region;
- it combines the postextractional healing time with the bone healing around the implant, which considerably shortens the treatment time;

Disadvantages

- there is a high risk of infection, if a periapical or periodontal lesion is not removed completely;
- some dental alveoli, especially in the upper jaw, are placed too buccal to allow the insertion of an implant in best conditions;

- sometimes the direction of the implant site must be placed orally to ensure a good initial stability - thus, the practitioner must use an angulated post.

Case report



Figure 1. A 21-year-old male patient presented in our clinic after suffering a frontal traumatism

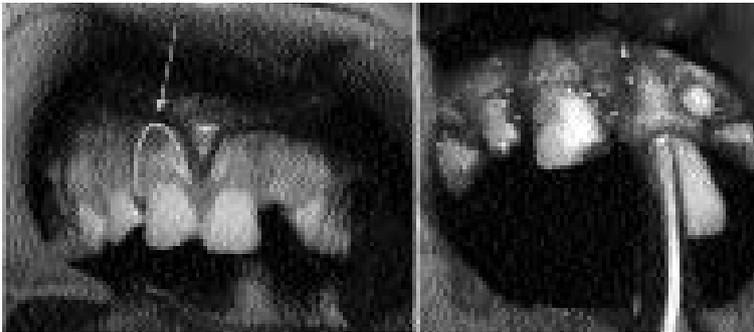


Figure 2. Intraoral images. The buccal cortical bone was fractured during the accident, and it was removed together with the two central incisors. The interalveolar septum is maintained. Because the crowns of 1.2 and 2.2 were fractured, exposing the pulpar chambers, root channel treatment was performed and the teeth were prepared to be used for the temporary prosthesis

Figure 3. After the extraction of 1.1 and 2.1 the two implant sites were prepared

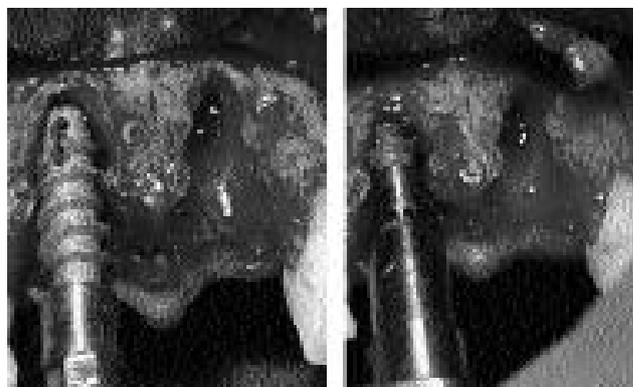
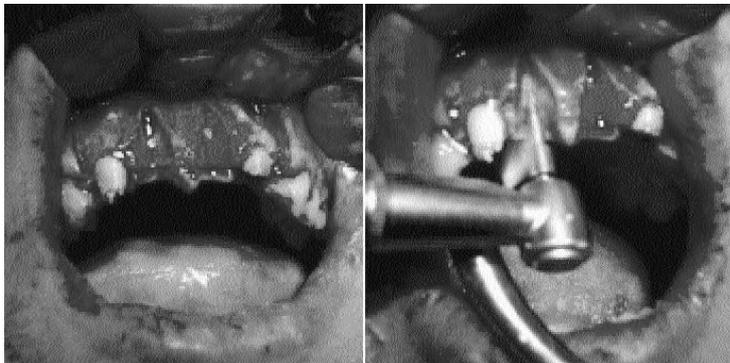


Figure 4. The insertion of the implants

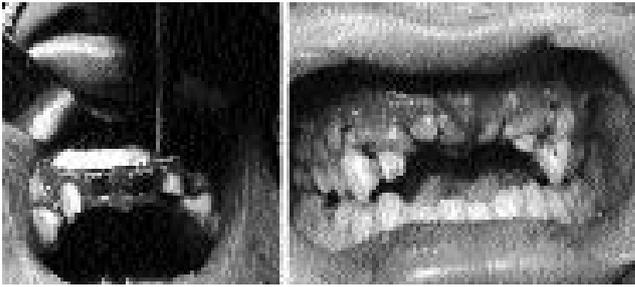


Figure 5. After the insertion of the implants, the buccal bone defect was augmented, using PepGen and PRP, and the grafting material was protected using a resorbable membrane, fixed with titanium pins (left). Mucoperiosteal flaps suture (right)

Figure 6. Postoperative Rx ortopantomography. Immediate after the intervention, an acrylic prosthesis was made, to be cemented on 1.2. and 2.2. The second surgical intervention was planned 4 months later



Figure 7. Control Rx ortopantomography 4 months later. The bone integration of the implants and of the bone graft was controlled



Figure 8. Intraoral images. The soft tissues surrounding the implant healed. Because the titanium pins were visible through the thin buccal gingiva, their removal was needed

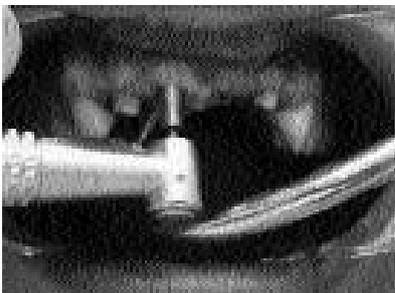


Figure 9. The implants were discovered using the circular scalpel. This way the emergence profile was prefigured



Figure 10. The soft tissue was once again incised and reflected, to remove the titanium pins. Usually this maneuver is not performed, but since the pins were visible through the buccal gingiva, they were removed. On this occasion we could also observe directly the good integration of the grafting material

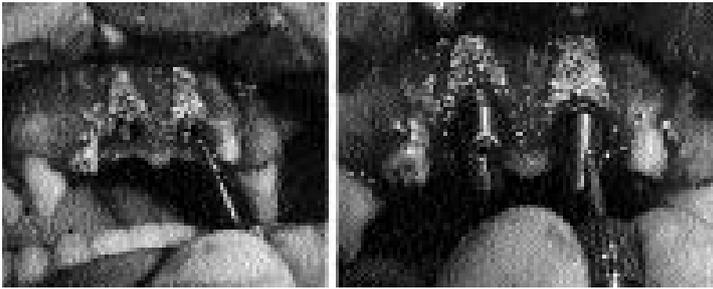


Figure 11. The removal of the healing caps and the mounting of the prosthetic posts



Figure 12. Mucoperiosteal flaps suture

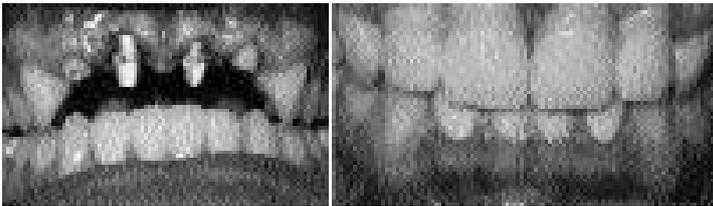


Figure 13. Intraoral images after the removal of the suture wire and the preparation of the prosthetic posts. A metal ceramic prosthesis was made, which rests on both the implants and the lateral incisors

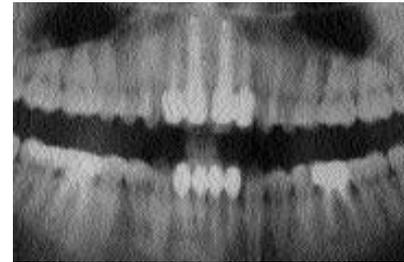


Figure 14. Rx ortopantomography after cementing the metal ceramic prosthesis

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