Factors of Success in Immediate Implantation

Immediate implantation is becoming more and more commonly performed in dental offices. With this technique, the Socket Preservation procedure can be performed. The patient can wear an implant-supported restoration immediately and does not have to wait several months until the wounds have healed and until the treatment is finished. The advantage of the MIMI® method (Minimally Invasive Method of Implantation) is that we can see and feel the bone by checking the bone cavity, which is certainly easier for the dentist during the implantation! We avoid the standard incision of the mucosa, especially the opening of the vestibular mucoperiosteal flap. We have been inserting dental implants according to this so-called "flapless" method for decades.

The patient-friendly minimally invasive treatment is performed with other implant systems as well. In fact, the detachment of the periosteum in the classical procedure can have negative consequences for the patient since this can lead to poorly nourished bone, particularly in the peri-implant area.

Our observations and experiences, as well as many published studies, have shown that often the crater-shaped defects and cases of peri-implantitis that occur with two-piece implants are caused by the following factors:

- poorly nourished bone
- the micro-gap in multi-piece implants, which is vulnerable to bacterial penetration
- a pressure overload (this occurs when there are not enough implants or strong teeth to withstand strong shear forces)

The one-piece Champions® implant is an excellent, affordable implant, which itself serves as an "osteocone" and which can be easily restored directly after implantation. Thanks to its micro-crestal thread, the implant allows surrounding bone to be laterally condensed and ensures excellent primary stability. For several years, immediate implantation has been shown to have long-term beneficial effects on bone, and highly aesthetic results have been obtained. The implant surface is engineered and manufactured in Germany according to the highest quality specifications. In addition, immediate implantation has shown to be effective in the treatment of complicated cases involving the front teeth.

**Fig. 1 - 3:** X-ray images of an immediate implantation: the Champions® implant was inserted to replace the tooth 11. The tooth extraction, the implantation, and the zircon Prep-Cap cementation were performed in the same session (Fig. 1 and 2). Then, you can then see the X-ray image of the clinical case 4 months after the zircon crown was placed, which had been fitted 8 weeks following surgery. The temporary fixed restoration and the proximal surfaces of the adjacent teeth were splinted together by hand with composite. In Fig. 3, you can see the cresto-peri-implant ossification. The implant allowed a perfect GBR (“Guided Bone Regeneration”) and the zircon Prep-Cap an optimal GTR (“Guided Tissue Regeneration”).

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Whenever possible, we avoid drilling in acute inflammatory sites and inserting implants in this area (even after a thorough curettage of the alveoli). Instead, we drill in healthy and solid bone in the lingual/palatal direction of the alveoli by using the conical triangular yellow Champions® drill. In this case, primary stability was achieved at a torque of more than 60 Ncm. For this reason, you should always first insert a 3.5 mm - diameter Champions® implant (in this case, the implant thread had a length of 16 mm).

The keys to success in both immediate and delayed implantation with the Champions® implant system are: drilling a cavity in the bone with the conical triangular yellow drill and with the conical triangular black drill (!!) with laser markings every 2 mm. These drills do not "slide along" the bone wall (thanks to the conicity of the implant, perforations almost never occur, even in the alveolar wall), but rather, they allow–like the implant itself– the bone to be well-condensed.

**Fig. 4 - 6:** As soon as the metal insertion aid had reached a depth of 2 mm subgingivally, the implantation was completed.

Description of the implantation: After the bone cavity check with a sterile periodontal probe, we carefully inserted the implants 2 mm subcrestally. Then, we fitted the optimal Prep-Cap, (currently, the Prep-Caps are available in 10 combinations of shapes, angles and cementation heights). Then, we cemented the Prep-Cap 2 mm subgingivally with Glasionomer Base Cement. Usually, excessive cement can only flow out orally but not axially. The Prep-Caps, in particular those made of zircon, serve as a permanent membrane and ensure good and rapid GBR ("Guided Bone Regeneration") and GTR ("Guided Tissue Regeneration") processes.

They therefore allow good bone growth and prevent the "downgrowth" of the gingiva.

**Fig. 6** shows the process a week after the implantation, where no inflammation was observed. After the implantation and the cementation of the Prep-Caps, we fabricated a plastic temporary restoration, which we temporarily splinted together with the proximal surfaces of the adjacent teeth for 8 weeks in order to absolutely avoid lateral shear forces.

**Fig. 7 and 8:** After having removed the temporary restoration, we took a bite registration 8 weeks after the implantation (when secondary osseointegration stability had been achieved/Transition from primary osseointegration stability to secondary osseointegration stability). A week later, we fitted and cemented the final zircon crown.
Results Following the Principle "Keep It Safe and Simple" ("KISS") Concerning Extraction, Immediate Implantation, and Bone Substitutes:

The extraction alveoli should no longer be filled with non-resorbable material (which is also quite costly). This material can inhibit new bone formation. Bone substitutes cannot always promote bone regeneration, the so-called “party”. On the contrary, bone substitutes can lead to peri-implant complications and early losses, and can prevent wounds from healing well! We should ask ourselves: How does bone regenerate after a “normal” dental extraction? Do we fill each alveolus with so-called “party-breakers”, which is material that inhibits bone regeneration? Does an alveolar collapse occur when the vestibular wall—even if it is very thin—and the periost remain completely intact? Are dental fistulae present in the vestibular or in the lingual/palatal area? What is a granuloma? Why don’t all inflamed bone areas heal even after several root end surgeries?

When extracting teeth and then inserting the implants, the periosteum should not be injured (an injury of the periosteum can be caused by the mucoperiosteal flap and by detaching or slitting the periosteum). The periosteum is crucial because it allows crestal and coronal bone to be nourished, and it is responsible for the resorptive process of the alveoli. The Minimally Invasive procedure (MIMI®) is successful and reliable because the periosteum can be 100% preserved. The Ridge and Socket Preservation technique should be performed, and available alveolar bone and the vestibular bone lamella can be preserved. If there is available autogenous bone (obtained from the alveoli or through non-invasive and transgingival drilling), this osteoinductive material can be mixed with collagen supplements (e.g., cost-efficient Gelastyp) in the residual alveoli if necessary.

When performing an immediate implantation with the Champions® system, the alveoli are no longer filled by the implant itself but by the zircon Prep-Cap, which is fitted and cemented on the implant. In this way, bone has enough time to regenerate as if there were no implant. Complete bone regeneration can be ensured without any vestibular or alveolar collapse.

When inserting Champions® implants, we should proceed in the following way: we insert a Champions® implant (preferably with a length of 50% more than the alveolus) in the alveolar wall, either in the lingual or in the palatal direction (at a torque of 40 Ncm). The implant micro-thread should be 1-2 mm below the imaginary line between the palatal alveolar wall and the vestibular one and the imaginary line between the distal alveolar wall and the mesial one. A few months later, the implant can already be osseointegrated subcrestally. The hollow part of the zircon Prep-Cap should be cemented 1-2 mm subgingivally so that the gum line looks natural (“red-white aesthetics”).

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Fig. 9 – 12: Tooth 14, on which there were fistulae in the vestibular area, could not be preserved and needed to be extracted. Following extraction, we inserted a 3.5 mm-diameter Champions® implant with a length of 14 mm. Then, we fitted a zircon Prep-Cap and a temporary restoration. We temporarily splinted together the temporary restoration with the proximal surfaces for 8 weeks. After 8 weeks, we took the bite registration. A week later, we finally fitted and cemented the crown.
Fig. 13 - 20: Teeth 37 and 32-42 could not be preserved. With the triangular yellow drill and the black drill, we drilled in residual bone. While drilling, bone spreading in the alveolus could be ensured. The Champions® implant itself served as an "osteotome". We temporarily fitted the prosthodontic restoration with Implantlink only two weeks following the implantation and the cementation of the zircon Prep-Caps. The alveoli were filled with a zircon dental framework in the laboratory, which led to the perfect healing of the soft tissue. When performing immediate implantations, it is preferable to insert a Champions® implant with a length of 50% more than the length of the root. However, there are anatomic limits because of the inferior alveolar nerve in the premolar and molar region of the mandible.

Currently, our goal as dentists is to offer our patients implantation and prosthodontic treatments that meet their demands: rapid and comfortable treatments, a minimally invasive procedure, aesthetic restorations, and also, affordability.

Dentists can now perform an immediate implantation and provide aesthetic prosthodontic restorations immediately by using the most up-to-date and cost-efficient equipment.

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