

A new approach to immediate treatment for edentulous jaws
With the achievements of modern dentistry, dentists can now offer to provide prosthetics immediately after implantation. Accommodating all the patients' wishes is still difficult in some cases.

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It must be noted that, when compared with today, the basic physiological and biological mechanisms of osseointegration of implants have not changed substantially from the beginnings of enossal implantology. The full load-bearing capacity of an implant is only given once full osseointegration has taken place. It is well known that this takes time and is dependent on factors such as location, bone quality, mechanical irritations etc. New developments in the field of implant surfaces have also helped to reduce the healing times substantially. Furthermore, modern augmentation techniques permit the placement of implants in positions that would have been unthinkable in the early days of implantology.



Fig. 1: The edentulous mandible with healed wounds, the ideal condition for immediate treatment. – Fig. 2: Maxilla with residual teeth. The implant positions can no longer be freely selected for immediate treatment. – Fig. 3: Due to the splinting spanning a large area, teeth have remained preserved which have caused substantial destruction due to parodontosis.



Fig. 4: The initial situation for mandibular treatment. – Fig. 5: The remaining teeth in the mandible are extracted. - Fig. 6

CASE REPORT

Parameters

The most important parameters that must be fulfilled for successful immediate loading are therefore: good implant surface design, adequate availability of stable bone, good primary stability during implant placement and avoidance of mechanical over-loading during the healing phase. The transferral of all these requirements to treatment for edentulous jaws suggests that an initial categorization is required into:

1) a jaw that has already been edentulous for some time, with healed wounds and regenerated structures (Fig. 1),

2) A jaw that has residual teeth where, in spite of fresh extraction wounds, implants are placed in the same session directly after the extraction (Fig. 2).

The requirements for immediate loading are primarily that there must be an adequate availability of bone. Furthermore, bone grafting must largely be avoided. The implant placement area in the maxilla is thus restricted to the region between 15 and 25, depending on the degree of pneumatization of the maxillary sinus. The intraforaminal area of the mandible can be considered for such treatment.

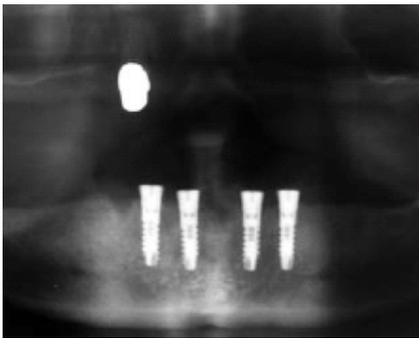
The prerequisite: "free of mechanical over-loading" means that several implants must be inserted in all cases and that these must be primarily splinted. The minimum number of implants inserted in such treatment is four for the mandible and six for the maxilla, under the above-mentioned preconditions. The primary splinting is accomplished with a bar. Particular attention must be paid to ensuring that the connecting elements, implant – bar – removable tertiary construction, only reach a maximum abutment height such that the technician can locate the teeth where they belong functionally without placement guides, as would be the case using telescopic

CASE REPORT

methodology. This makes clear that "the edentulous, fully healed jaw" is the simplest case for treatment. The implants can usually be inserted without any great difficulty. Impression taking and further treatment is generally uncomplicated. Treatment can be carried out successfully, just as it has been over many years and as has also been described on numerous occasions, if placement depth is adequate, distances between support abutments are sufficient and the possibility of linear connections with bars between the individual implants are guaranteed. The situation is far more complicated in cases where residual teeth are present in small or large numbers. Many people find it very difficult to agree to the removal of their remaining teeth, even if this is in the interests of further pending treatment. The reason for the removal of the residual teeth is usually substantial destruction that can no longer be treated using combined endodontics and prosthetics, or extensive defects due to parodontosis (Fig. 3).

In both cases, there will probably be substantial alveolar defects, which greatly complicate the simultaneous implantation described above, especially with a view to subsequent immediate treatment.

It is thus imperative that an implant system is available that permits stability to be obtained through primary splinting, even when the placement positions are no longer determined by the wishes of the dentist and the prosthetic requirements, but are being dictated by the situation. Even if it is possible, in an ideal case, to achieve parallel alignment of the support abutments within a range of only a few degrees without navigation, there may still be large divergence. Both options, the rather more ideal, as well as the marginal case, will be discussed in detail in the following case.



Figs. 6 and 7: The placement of four implants was without complications. – Fig. 8: Primary wound treatment using gingiva formers in situ



Figs. 9 and 10: The impression coping is screwed on and the impression made conventionally. – Fig. 11: The base parts and cones are selected in the laboratory. – Fig. 12: Try-in in the mouth reveals the correct choice of base parts

Case description

Patient, male, aged 55.

Treatment of a mandible. The initial situation (Fig. 4). Both molars were extracted from the maxilla and a cover denture was produced using 13 as the supporting tooth, which served as a provisional replacement. Making a new dental restoration for the opposite jaw is often a very sensible measure to take, as this permits avoiding the effects of malocclusion in the jaw under treatment, with all its negative consequences ranging from statics to aesthetics. The remaining teeth in the mandible were extracted and the gaps were filled with a

provisional extension to the existing denture (Fig. 5). Immediate implantation would have been possible but could not be implemented due to the patient's work commitments. Four implants, 14.5 mm/4.2, manufactured by Schütz Dental GmbH (IMPLA), were inserted in ideal positions without any complications (Figs. 6 and 7). After this step, conventional wound treatment using conical gingiva formers, which allow complete healing, followed by stitching, is recommended initially. We then ask the patient to cool the treated wounds for approx. 15 min., to minimize the formation of the postoperative oedema and possible haematomas (Fig. 8).

CASE REPORT

This approach has proven successful, as production of an impression prior to stitching does provide better control of the situation, but results in only very imprecise gingival conditions later on. The gingiva formers are now removed and exchanged against the impression coping. The impression is made in the usual way and the gingiva formers are then screwed in again (Figs. 9 and 10). This is easily accomplished, not in the least due to the previous brief waiting time, as the primary healing process with initiation of scar contraction that is already underway has produced the initial shape of the mucosa based on the gingiva former. The placement of the implants and production of the impression is therefore complete. The model is produced in the laboratory and the abutments are made with the aid of the components of the IMPLA-Direct-System. The technician selects a base part that is tub-shaped, under consideration of the thickness of the mucosa. The cone, available at angles of 0°, 7.5° and 15°, is placed on this base part (Fig. 11). The correct combination of both parts results in the cone extending above the mucosa, such that subsequent luting on of the tertiary structure poses no problems (Fig. 12). Free rotation of the cone in the base part generally permits parallel orientation of the support abutments without any additional measures. The system is secured using an occlusal screw through the cone and the base. The tertiary structure is modelled and cast on this situation. Attention must be paid when fitting this part to ensure that there is some play in the fit so that the parts can later be luted in the mouth (Fig. 13). Now everything is returned to the practice to be luted, including the parallel model produced to test occlusion and assess the aesthetics.

CASE REPORT

The gingiva formers are removed and the base and cone are screwed together. All parts are interchangeable if selection of the 0° cone was possible; otherwise, it is of great importance to ensure that each component is placed at the correct angle in the right position. However, this is easily accomplished using a plastic template supplied by the laboratory (Figs. 14 and 15). Base part/cone and the tertiary structure can now be luted in the mouth of the patient; then the wax try-in is assessed (Figs. 16 and 17). If everything is satisfactory, then the piece is returned to the laboratory so that the luted construction and the denture wax try-in can be combined. A further try-in can be conducted if required, or final production can commence immediately. The finished piece is then integrated into the patient's mouth and a satisfied patient leaves the practice a few days after implant placement with a fully functional dental restoration (Fig. 18).

CASE REPORT

Summary

All patients desire a high quality dental restoration, which guarantees them unburdened social contact in public. Furthermore, many of these patients desire treatment that is as rapid as possible in cases where there is a threat of losing all teeth or where this has already occurred. The IMPLA-Direct-System makes this possible. The base parts and different cones can compensate for different mucosal thicknesses and all divergences between

CASE REPORT

support abutments which can occur within the framework of implants conducted under suboptimal jaw conditions. Extensive concomitant treatment, such as bone grafts are generally not necessary, thus providing good conditions for immediate further treatment. IMPLA offers the practitioner a system that is easy to handle and which facilitates granting the patient's wishes, irrespective of the initial situation.

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Fig. 13: Everything is prepared for luting in the mouth once the tertiary structure has been produced. – Fig. 14 and 15: The base parts and cones are located in their exact positions using a key.



Fig. 16: The tertiary structure is luted in the mouth. – Fig. 17: A functional and aesthetic try-in is conducted. – Fig. 18: The finished restoration.