Complete Reconstruction of Edentulous Mandible and Maxilla Using the Q-Implant System and Applying the Two-Phase Implantation With Early Loading

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Presently, implantation is a method for rehabilitation of the stomatognathic organ, which offers the patient the greatest hope for quick return of masticatory function and aesthetics, as well as an opportunity for the maintenance of good hygiene. What is important is thatleviates the patient's complexes caused by the imperfection of conventional dental prosthetics treatment.

Development of implantation also results in the growth of knowledge on the part of the patient, who expects dentists to offer solutions that until recently remained only a dream. Nowadays, such dreams have become true —"a tooth in one day" and "early or immediate loading" are already broadly used methods for rehabilitation of the masticatory process.

The scope of action taken by the dentist is today more a matter of a decision made by the patient than the matter of treatment technique. The case described below presents an unconventional concept for the reconstruction of a patient's masticatory organ featuring early loading with the Q-Implant implantation system (Trinon Titanium GmbH).

A 70-year-old patient came to the surgery with a completely edentulous mandible and maxilla (Fig. 1). He had lost most of his teeth several years before, and the remaining teeth (45, 43, 33, 32) had been extracted immediately before coming to the implantation appointment. After preliminary diagnostics, two-phase implantation was planned and fixed prosthetic reconstruction with deferred early loading. Before commencing the procedure, complex case analysis was performed. A number of X-ray pic-


Fig. 1

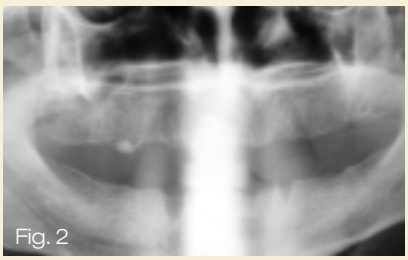
Fig. 2


Fig. 3

[Figures 1 and 3] Patient before treament. – **[Figure 2]** OPG of the 70-yeasr-old paient: edentulous mandible and maxilla.


Fig. 4


Fig. 5


Fig. 6

[Figures 4 to 6] When planning treament, an arcylic splint was made with titanium tubes. It was transmucously stabilized with osteosynthesis screws.

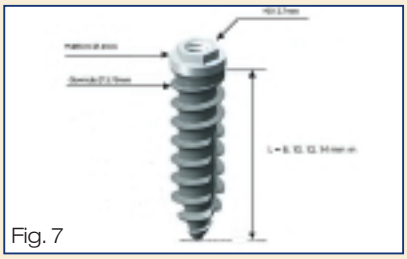
Fig. 7

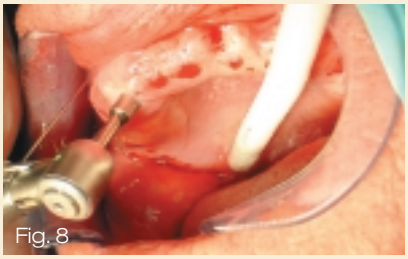
Fig. 8

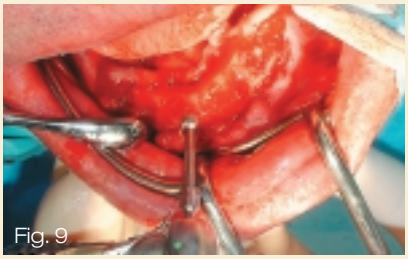
Fig. 9

[Figure 7] Schemate of the Q2 implant. – **[Figure 8]** Procedure for implant driling. – **[Figure 9]** Leveling the mandibular alveolar process.

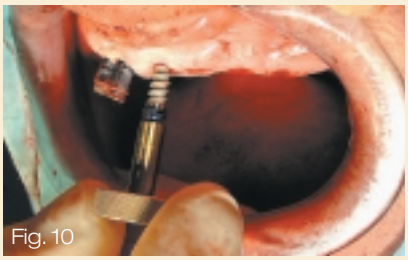
Fig. 10


Fig. 11


Fig. 12

[Figures 10 and 11] Procedure for implant driling. – **[Figure 12]** Augmentation with Bio-Gen bone around the implant.


Fig. 13


Fig. 14

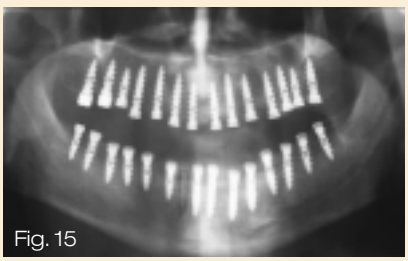
Fig. 15

[Figures 13 and 14] Positioned implants with transfering post. – **[Figure 15]** OPG after implantation . Two-phase system.

tures were taken, along with laboratory tests, casts, and measurements with a dental caliper (Fig. 2 to 3). All these activities allowed a good assessment of the bone.

The procedure was planned with the participation of an anesthesiologist, who applied analgosedation intravenously. Analgosedation reduces fear and calms the patient down, ensuring his comfort during the procedure. It is also a method comfortable to the dentist, as it allows for easy and calm work with the possibility of full cooperation from the patient. Due to the vast area of surgery, the patient was administered Clindamycin-Mip 600 mg (2 x 1) for six days.

The treatment plan included performance of an acrylic splint with titanium tubes, which sets the distribution and parallelism of the implants already at the planning stage, facilitates the work of the dentist, and shortens the duration of the procedure. The splint was stabilized transmucousally with osteosynthesis screws (Fig. 4 , 5, 6).

During the implantation, 28 two-phase implants of the Q-Implant system (Trinon Titanium, Germany) were used with diameter of 3.75 mm and lengths from 10 mm to 14 mm. A characteristic feature of the system is the aggressive drill entered into the bone through a bone incision, which results in very high primary stabilization of the implants (Fig. 7). It is important for the process of osseointegration and further prosthetics actions on the implants (Fig. 10, 13, 15). In the maxilla and the posterior sections of the mandible, favorable bone conditions (appropriate width of the alveolar process) allowed for the application of gingival trephines (Fig. 8, 11). The technique minimizes the traumatic character, scope and duration of the procedure. In the front section of the mandible, due to recent extractions, it was necessary to perform flap surgery and levelling the bone base with cutter burs (Fig. 9).

Furthermore, in the area of tooth 45, controlled tissue regeneration proved necessary, leading to reconstruction of the bone structure losses. It was performed using the Bio-Gen material mixed with autogenous bone acquired from the surgery area, and secured with a re-absorptive Biocollagen membrane (Fig. 12). Bio-Gen is re-absorptive, deantigenous, osseoconductive bone material of horse origin (bioteck, Italy). Autogenous transplants, the "gold standard", have an osseoinductive and osseoconductive effect, forming the best regen-

eration material available today. Mixing the two materials together achieves a good therapeutic result.

The advantage of resorbable membranes, however, is the fact that they are easy to use, form a barrier to infections, and no second procedure is needed to remove them. Simultaneously with augmentation, Q2 implants were inserted (cf. Fig. 7) with diameter of 3.75 mm and length of 12 mm, which achieved primary stabilization. The procedure of implant drilling with simultaneous augmentation is possible only in the case where the existing area of the bone tissue allows for achieving primary stabilization of the implant.

In order to avoid the tension of the mucous membrane and its anemization, the method of split muco-periosteal flap was used. Unfortunately, a smoking habit and poor hygiene during the healing period resulted in slight dehiscence and a less satisfactory result of treatment in this part of the mandible. Healing of the mucosa around screws occurred after three weeks (Fig. 14, 16). The procedure of immediate and early loading of the implant, according to many theories, gives the advantage over the deferred loading procedure due to the beneficial impact of the tension transferred through the implant into the bone. Wolff presented a law stating that the final bone construction is formed as a result of its direct activity. This knowledge and the growing experience of dentists make us reach for immediate and early loading increasingly more often. That is also why the early loading method was used for treatment in this case.

When the soft tissues became completely stabilized, the prosthetics part was commenced. A decision was made on performance of a complete prosthetic restoration with deferred early loading already in the fourth week after implantation.

Such procedure was allowed by:
– wide alveolar processes,
– good density of the bone tissue,
– high primary stabilization of the implant,
– construction of the Q-implant screw.

Due to the extended area of the prosthetics, taking the impression proved problematic. Any inadequacy in this phase of work prevents a good final therapeutic effect. That is why two-layer two-phase impressions with Bisico compress-mono mass and super-hydrofil S4 with transfer posts on the open, completely unscre-


Fig. 16


Fig. 17

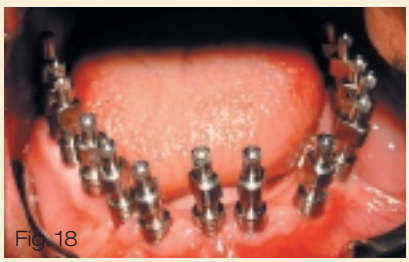
Fig. 18

[Figure 16] Gingiva former. – **[Figures 17 and 18]** Screwing /unscrewing screws to transfer posts.

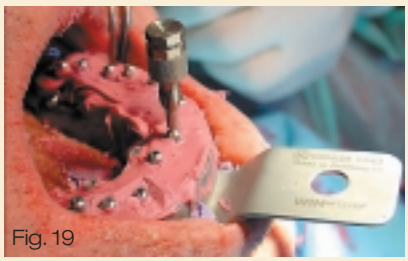
Fig. 19


Fig. 20


Fig. 21

[Figure 19] Screwing /unscrewing screws to transfer posts. – **[Figure 20]** Two-layer impression with transfer posts. – **[Figure 21]** Articulator with set construction bite registration.

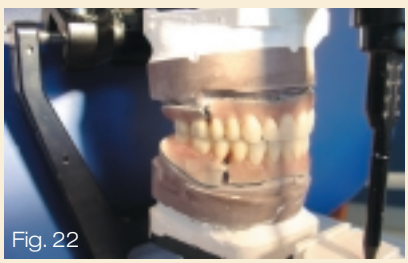
Fig. 22


Fig. 23

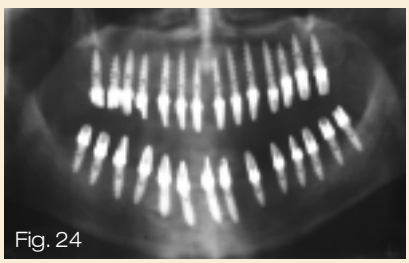
Fig. 24

[Figure 22] Articulator with set construction bite registration. – **[Figures 23 and 24]** Abatments with burned porcelain.


Fig. 25


Fig. 26


Fig. 27

[Figures 25 and 26] Checking cat bridges. – **[Figure 27]** Porcelain Bridges. Laboratory phase.


Fig. 28


Fig. 29


Fig. 30

[Figures 28 and 29] Cementating porcelain bridges. – **[Figure 30]** Chcecking porcelain bridges.


Fig. 31


Fig. 32


Fig. 33

[Figures 31 and 32] Cementating porcelain bridges. – **[Figure 33]** Final efect.

wable spoon patented by Kohler. The spoon is composed of modules which are easily screwed or unscrewed from the main construction, forming any shape of the spoon, depending on our needs and the scope of the impression.

The spoon allows for unscrewing the screws for the mounting of transfer posts on implants, which stand out from the mould, before taking it off the mouth (Fig. 17, 18, 19). Impression transfer posts are long in this system and have large incisions which stabilize them well in the impression, preventing a position change. Finally, a very accurate impression was achieved, on which further laboratory procedures were made. Using the articulator, the construction bite and height of the occlusion were set (Fig. 21). Templates and pilots for teeth were based on the splint screwed to the implants with abutment screws (Fig. 22).

After setting the correct construction bite registration of the occlusion in the prosthetics laboratory, abutments were burnt and cast bridges were made with porcelain coating. Because of the very thin mucous membrane in the cosmetic areas, porcelain burns were made on the abutments. At the bridge designing stage, a concept was adopted of several splinted bridges in order to maintain the appropriate distribution of forces on the implants (Fig. 23 to 26).

During porcelain burning, the age of the patient was taken into consideration, which resulted in the individual characterization of work in the form of colouring, abrasion and cracks made in the enamel (Fig. 27 to 32). This type of reconstruction is a rare solution, although its application will enable us to learn the biomechanics of the bridge-implant connection in such a concept of prosthesis. Attention must also be drawn to the fact that the bone area covered was very large and patient's jaws were highly developed, which inter alia led to the decision on performing such a construction. To conclude, experience gathered in this way will allow us a much more convenient application of implantation in the near future (Fig. 30 and 33).

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