

## **Case report of an implant-supported restoration in the mandible**

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The following case report demonstrates an implant-supported mandibular restoration with four endosteal cylindrical implants. The report includes details on the implant system used.

The favourable long-term results in oral implantology and the reliability of modern treatment methods have integrated the implant-supported prosthetic construction as an integral part of the daily therapy in the dental clinic. When planning a therapy of the edentulous jaw, implant-supported superstructures have to be considered as an alternative restoration. Easy handling and improvement of the implant prosthetics at the same time are decisive factors for the dentist as well as for the patient in order to achieve a well-functioning long-term result. The following case introduces a therapy method which comes up to my expectations completely.

### Case Description

The patient had been restored over a long time with a telescoping (overlay) denture in the mandible and a total denture in the maxilla. After fracture of tooth 44 and a mobility grade 2 of teeth 34 and 35, a new restoration was planned for both upper and lower jaw (Fig. 1). The panoramic X-ray (Fig. 2) demonstrates the strong alveolar bone atrophies in both jaws.

The implant-surgery of the lower jaw included the insertion of four endosteal Pitt-Easy cylinder implants\* with selftapping threads, in the interforaminal region. The situation intra-operative (Fig. 3-5) clarifies the symmetrical strategic distribution and the parallel direction of the implants. In region 44 the implant was placed immediately into the extraction socket. The vestibular non-covered implant surface area and the defects of the extraction sites 34 and 35 were augmented with bone replacement material (Bioresorb\*) which was covered with a non-resorbable PTFE membrane (Cytoplast\*) for guided bone and tissue regeneration (Fig. 6).

The radiographic control immediately post-op (Fig. 7) showed a parallel direction of the implants and the optimal use of the vertical bone. The two Cytoplast membranes inserted intra-op were removed after 25 days without any problem. The tissue site shows an osteoid structure at this point, and the muco-periosteal healing of the augmentation site took place without reaction by complete maintenance of the alveolar bone profile.

Three months post-op, the surgical re-entry of the submerged four Pitt-Easy implants was performed. A very careful tissue-preserving procedure maintaining the gingiva propria is recommended. After removal of the implant cover screws, the gingival formers are inserted (Fig. 8). The periotest showed results of -04 or -05 resp. the x-ray control (Fig. 9) shows a perfect osseointegration of the implants and the gap-free fit of the gingiva formers.

After healing of the gingival situation, the impression posts (open or closed impression) are screwed on. This case shows an impression with a confectioned closed impression tray (Fig. 10 and 11). Fig. 12 demonstrates the repositioned impression posts in the impression (of polyether material "Impregum"). The well-balanced selection of implant prosthetic parts enables a safe and precise transfer of the clinical situation from the surgery to the dental laboratory.

We selected as implant prosthetic therapy the restoration on the four implants by a bar construction. The primary blocking of the implants was achieved by the screw-on extension bar on ball posts ( Fig. 13 and 16). The ball posts do not require a mutual insertion direction, thus enabling a compensation of disparallel implants (axis divergencies) without problem in an optimal way. Passive connection elements on the ball posts are the ball post caps made of burn-out acrylic with occlusal screw perforation. (Fig. 14).

The favourable anterior-posterior implant positioning achieves a polygonal stability of the implants, which on one hand avoids any unfavourable loading of the implants and the bone anchorage, and on the other hand enables the extension of the bar in region 35 and 35 (Fig. 17 and 19). The design of a partial implant-supported prosthetic restoration is guaranteed.

The resistance of the prosthetic construction against retraction and pressure forces is guaranteed by three universal castable ball anchors (Root-Buffer-Attachment\*) and is economic, but very effective (Fig. 15 and 19). The ball anchors, which are available for all removable implant superstructures included in prosthetic construction (Fig. 18), can be used in positions either in the middle or both ends, and provide a three-dimensional buffered retention of the denture, with a high comfort and an optimal safety for the patient. The circular active ring (rubber ring) can be removed easily from the metal ring housing at fatigue without problem and replaced by a new one. Since all parts necessary for this system are made of burn-out acrylic, any of the available alloys can be used and the construction prepared in a one-piece casting procedure.

After final healing, a gingival situation was achieved which was absolutely without irritation and with sufficient fixation of the peri-implant tissue (Fig. 16). The bar construction was inserted onto the implants with screwed-on ball posts without tension and screw-fixed through the occlusal screw perforations (Fig. 16 and 19). The design of the bar with assured optimal hygiene care at the peri-implant area is of high importance for the long-term success of the restoration. The radiographic control (Fig. 17) shows the precise fit of the bar construction on the Pitt-Easy implants. The base view of the mandibular denture (Fig. 18) shows the casted model construction within the acrylic base with the three metal housings and the inserted circular active rings.

## Conclusion

The therapy introduced with this case showed a successful result that has been proven in dental practice (Fig. 20) and comes up to the expectations of patients with regard to a simple economic solution for safe and comfortable denture function.

## Legends:

Fig. 1: Clinical situation pre-op

Fig. 2: Panoramic radiograph for therapy planning

Fig. 3: Situation intra-op with parallel indicators inserted

Fig. 4: Implant insertion

Fig. 5: Implants in situ with cover screws inserted

Fig. 6: Augmentation with Bioresorb

Fig. 7: X-ray control post-op

Fig. 8: Re-entry exposure of the implants

Fig. 9: X-ray control, gingival formers inserted

Fig. 10: Impression posts screwed on

Fig. 11: Impression posts with occlusal closure

Fig. 12: Impression with impression posts

Fig. 13: Mandibular model with ball posts

Fig. 14: Ball posts do not require a mutual insertion direction

Fig. 15: Root-Buffer attachment

Fig. 16: Ball posts in situ

Fig. 17: X-ray control, bar construction inserted

Fig. 18: Basal view of the mandibular denture

Fig. 19: Bar construction screwed on

Fig. 20: Final result

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