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ORAL REHABILITATION WITH CAMLOG IMPLANTS

AFTER LOSS OF DENTITION DUE TO AN ACCIDENT

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Dr Hitoshi Minagawa successfully completed his studies in dentistry at Meikai University, Japan. After several years working for private clinics, he founded his own practice in Hamura, Tokyo in 1994. Dr Minagawa specializes not only in implant treatment, but also in laser treatment. He is an active instructor for laser-technologies (since 2001) and CT (since 2008). He has been one of the top instructors in charge of the advanced course in Tokyo for the CAMLOG® Implant System since 2007. He is a board member and the course instructor for the regular course of SJCD Tokyo. He also travels domestically and internationally for lecturing; for example, in 2003, he lectured at the "MEET FRIENDS" Exchange of experience in Baden-Baden, and he was one of the speakers for the 1st International CAMLOG Congress in Montreux, Switzerland in 2006 and the National CAMLOG Congress in Tokyo in 2007. Dr Hitoshi Minagawa is committed to his continuing education, and he is a visiting professor for Kanagawa Dental University. He has also published several books about implant treatment, laser treatment, and periodontal treatment.

IMPLANTS USED

Tooth	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
Implant type	SL		SL		SL		SL			SL		SL		SL		SL
Implant length	13.0		13.0		13.0		13.0			13.0		13.0		13.0		13.0
Implant Ø	4.3		4.3		3.8		3.8			3.8		3.8		4.3		4.3
Implant surface	P		P		P		P			P		P		P		P

Tooth	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
Implant type			SL	SL							SL	SL	SL			
Implant length			13.0	13.0							13.0	13.0	13.0			
Implant Ø			3.8	3.8							3.8	3.8	3.8			
Implant surface			P	P							P	P	P			

Implant type: ROOT LINE (RL) / SCREW-LINE (SL) **Implant surface:** Promote® (P) / Promote® Plus (PP)

PROSTHETICS

- ☐ standard
- ☐ platform switching
- ☐ removable
- ☒ fixed
- ☐ crown
- ☒ bridge
- ☒ cement-retained
- ☐ screw-retained
- ☐ partially edentulous
- ☐ fully edentulous
- ☐ other

- ☒ Universal abutment
- ☒ Esthomic® abutment
- ☐ Telescope abutment
- ☐ Gold-plastic abutment
- ☐ Ceramic abutment
- ☐ Custom zirconia on titanium base
- ☐ PEEK abutment
- ☐ Logfit® abutment
- ☐ Locator® abutment
- ☐ Ball abutment
- ☐ Bar abutment
- ☐ Vario SR abutment
- ☐ other

INFORMATION ABOUT PATIENT AND TREATMENT

The patient, a 61-year-old female, had lost her upper and lower molars due to a traffic accident two years prior to the initial visit in our practice. Titanium plates had been placed in the lower molar region on both sides and she had worn a partial denture. She had been using only her anterior teeth to bite and experienced nerve paralysis even two years after the accident. Due to her unstable occlusal condition, her anterior teeth were severely mobile at the time of the initial visit, and she hoped to get these teeth extracted.

In a full-mouth implant reconstruction case like this, the value of the result should be judged with regard to the long-term prognosis. This case has been treated for 8 years, now: 6-year treatment since the first visit and 2-year recall maintenance. All of the remaining teeth in the maxilla were extracted, and the socket preservation was implemented. Then, the surgical guide was fixed on the four implants placed in the anterior area as anchors, and four implants were placed in the maxillary tuberosity and sinus septa areas. In the mandible, the posterior teeth were neuroparalysed due to the effect of the accident, and the anterior teeth were displaced lingually. The displacement was corrected by an orthodontic treatment using the posterior implants as orthodontic anchors, and the occlusion was recovered. The neuroparalysis has been relieved progressively, and the patient is satisfied with the treatment and the results. This is a comprehensive case comprising surgical, prosthetic and orthodontic procedures.

Initial presentation

Fig. 1: Clinical situation: The occlusion had collapsed as a result of the traffic accident.

Fig. 2: Only the upper and lower anterior teeth were incorporated or involved in functional occlusion.

Fig. 3: The upper anterior teeth were mobile and hopeless. They were extracted.

Tooth Extraction

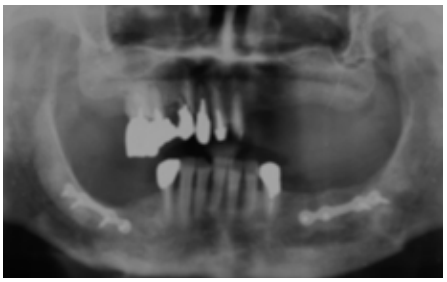

Fig. 4: Radiographic situation. Titanium plates had been inserted in the posterior regions of the mandible.

Fig. 5: The maxillary teeth were carefully extracted.

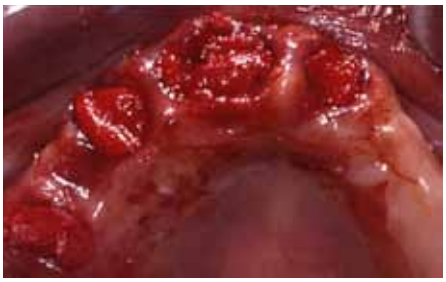

Fig. 6: After extraction, on the right side, ridge preservation technique was applied to preserve the soft- and hard-tissue contours: The alveolar sockets were filled with Bio-Oss® and covered with Bio-Gide® membranes. The extraction sockets on the left side were left untreated.

Implant insertion in the maxilla

Fig. 7: Clinical situation after 6 months: nicely healed soft-tissue contour of the alveolar ridge. The right side seems to demonstrate a wider dimension of the alveolar crest.

Fig. 8: Full-thickness flap preparation, demonstrating the dimension of the alveolar bone crest. Note the difference in bone width between the left side (extraction only) and the right side (ridge preservation). Ridge preservation seems to be a suitable technique to enhance the hard-tissue situation.

Fig. 9: Insertion of four implants (3.8mm x 13mm).

Fig. 10: Bone augmentation with Bio-Oss® and Bio-Gide® to increase the bone volume. The membranes were fixed with ALTApins.

Fig. 11: Clinical situation prior to the third surgical intervention after 12 weeks. The occlusal view showed a healthy soft-tissue situation around the anterior implants.

Fig. 12: Insertion of implants in the tuber maxillae. The surgical stent supported by the four anterior implants was used to place the implants in an optimal position.

Fig. 13: The implants placed in the maxillary tuberosity. The precise surgical guide system using the precise CT data is necessary for the exact placement of the implants in the correct positions.

Fig. 14: For precise insertion of the implants, a CT simulation is used to verify the axes and the locations in a three-dimensional view.

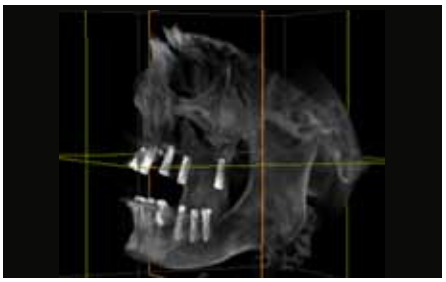

Fig. 15: CT-simulation of the left side.

Sinus floor augmentation

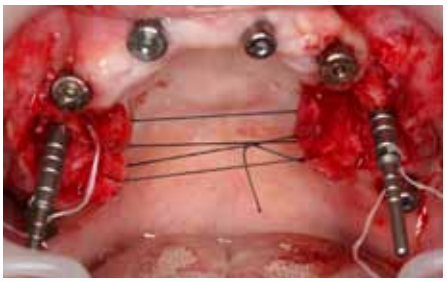

Fig. 16: Bilateral sinus floor augmentation to obtain more vertical bone and achieve optimal implant stability. Insertion of two implants (4.3 x 13mm) in both sides.

Fig. 17: In order to verify the exact positions and the depths, CT(3D)data were taken with the depth gauges during the surgery.

Implant insertion in the mandible

Fig.18: Removal of the mandibular titanium plates.

Fig. 19: Insertion of five implants (3.8mm x 13mm): three implants on the left side and two implants in the right mandible.

Fig. 20: For obtaining the necessary bone volume in the buccal side, bone substance was used and covered with the resorbable membrane.

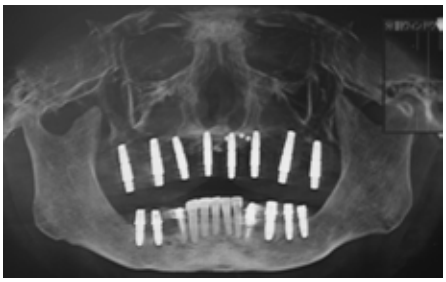

Fig. 21: Postoperative situation.

Impression-taking

Fig. 22: A custom-made tray for open impression technique was prefabricated on a first master cast. At the same time, a cast metal index frame was made in advance.

Fig. 23: The occlusal view demonstrated a passive and rigid connection of the impression posts to the metal framework. This prevented any technique-related distortion during impression-taking and later model processing.

Fig. 24: The impression was taken with a custom tray. The impression posts must not have any contact with the open tray. Using this method, distortion or discrepancies in accuracy can be avoided. This was the basis for a highly accurate master cast to fabricate a very precise framework.

Provisional prosthesis

Fig. 25: The framework was designed as a one-piece cross-arch structure based on eigth implants. The restoration was finally cemented on individualized universal titanium alloy abutments.

Fig. 26: Framework try-in on the individually prepared abutments, checking for passive fit of the structure. The restoration was designed for a pink base and single crowns bonded to the metal frame.

Fig. 27: The individual crowns were cemented to the metal frame utilizing acrylic bonding resin.

Fig. 28: After cementing the crowns, the gingival part of the restoration was added to the framework.

Fig. 29: Healthy soft-tissue situation prior to the installation of the primary provisional restoration.

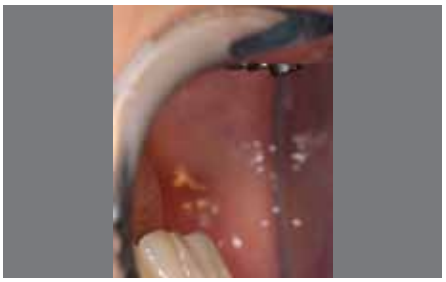

Fig. 30: As a result of the traffic accident, the lower anterior teeth were dislocated. An orthodontic anchor was applied to straighten up the anterior mandibular teeth.

Final prosthesis

Fig. 31: Orthodontic treatment. The implants were used as anchors in order to shift the teeth labially.

Fig. 32: Final prosthetis in place. In order to achieve a stable occlusion, a vertical stop was created by raising the occlusal height on the molar area.

Fig. 33: Hybrid resin was selected for modifications of the substructure.

CONCLUSIONS

This case represented a challenging treatment approach including ridge preservation, bone augmentation and orthodontic treatment. The aim was to achieve an adequate hard- and soft-tissue situation for implant placement and to improve functional occlusion. The result has been very satisfying regarding both the esthetic and functional outcome. The implants could be placed in positions that ensure optimal static stability. The use of a one-piece unit cross-arch structure with cement-retained single-crown restorations and the application of a gingival portion facilitate comfortable long-term maintainability even in the case of tissue loss. Adjustments such as contour adaptations of the gingival portion are easy to perform. The metal framework can be easily polished and allows good hygiene.

Initial situation

Fig. 34: Initial situation before the start of treatment.

Final situation

Fig. 35: Clinical situation six years after placing the final prosthesis. Note the clean and stable periimplant soft tissues and well-maintained fixed implant-borne full-arch restoration in the maxilla.

NOTES

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MATERIALS

Geistlich Bio-Oss®, Geistlich Pharma AG, Wolhusen, Switzerland
Geistlich Bio-Gide®, Geistlich Pharma AG, Wolhusen, Switzerland
CAMLOG ALTApin, CAMLOG Biotechnologies AG, Basel, Switzerland

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