CAD/CAM Removable Bridges on Ultra-short Implants in high Atrophic Maxilla

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Introduction

The prosthetic treatment of the severe atrophic maxilla request quite often an implant placement after an intense grafting procedure. The acceptance of intense grafting procedures e.g. with hip graft or bilateral sinus graft is limited especially for elder patients with multiple general disease. The use of ultrashort implants is an option to avoid grafting procedures. Standard treatment of short implants is the performed with multiple single units or short span bridges. For edentulous jaws the resilient stabilization of cover dentures on ball attachments is recommended. The full-arch reconstruction with short implants is not documented in a routinely procedure for removable bridges.

Material and Methods

In the last three years 12 patients with a severe atrophic maxilla were treated to receive a full arch reconstruction. 9 patients received six implants and 3 patients eight implants. All implants received a screw retained CAD/CAM milled bar after abutment placement. For a tension free delivery two impressions are necessary. First on implant level for the selection and preparation of the abutments. After the delivery of the abutment the final impression was performed.

Results

All patients showed a compromised medical history with cardiovascular disease, stroke, COPD which did not allow an intense surgical procedure. 8 patients received the implant placement with local anesthesia and 4 patients with local anesthesia and medical monitoring. All patients showed no surgical complications and all implants showed osseointegration after three months healing period. After delivery of the prosthetic rehabilitation all patients were satisfied with the improved fixation of the superstructure. The speech function was not compromised due to the direct contact of the resin on the palate. The sensitivity for eating was improved because all superstructure worked without a coverage of the palate.
Due to the severe atrophy a high restoration height was necessary with was between 16 and 28 mm. Due to the rigid fixation on the CAD/CAM milled bar no micro-movements occurred and the wear of the friction element was negligible.

Conclusion

Overall the placement of ultra-short implants in the high atrophic maxilla restored with a CAD/CAM milled superstructure and a removable bridge is a complication free possibility to improve the quality of life on medical compromised elder patients.

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Clinical Procedure for CAD/CAM Bar Construction on Short Implants

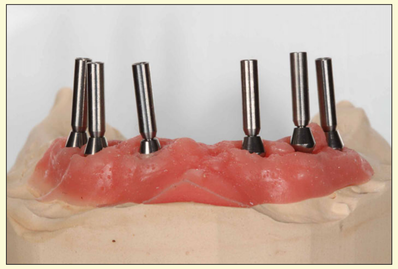

Fig. 1: Selection of multi-purpose abutments after implant level impression

Fig. 2: Prepared resin bar for in-mouth splinting for second impression

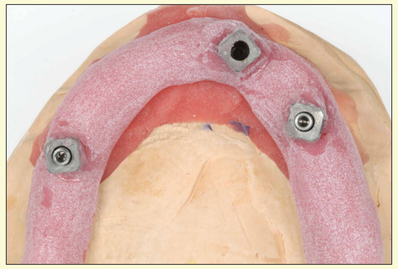

Fig. 3: Screw retained tray for bite registration on selected abutments

Fig. 4: Tray for first esthetic set up screw retained on abutments

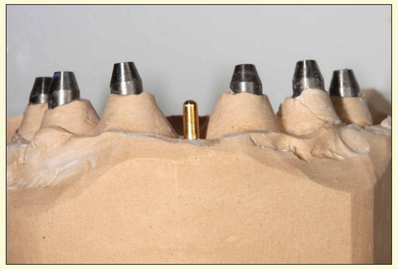

Fig. 5: Master model on abutment level (soft tissue mask removed)

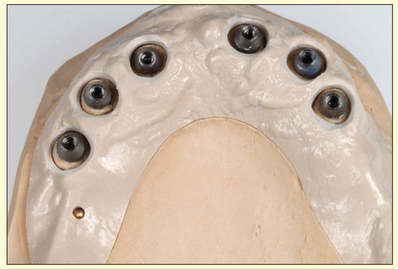

Fig. 6: Master model with non-flexible soft tissue mask

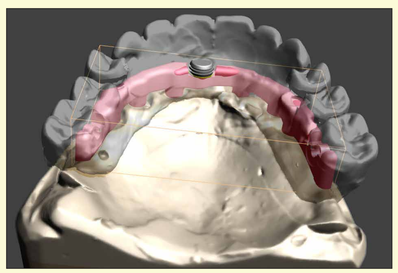

Fig. 7: Virtual teeth set up upon bar construction

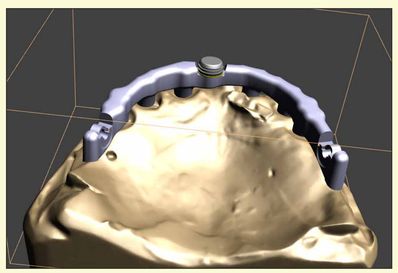

Fig. 8: Design for CAD/CAM bar with retention elements

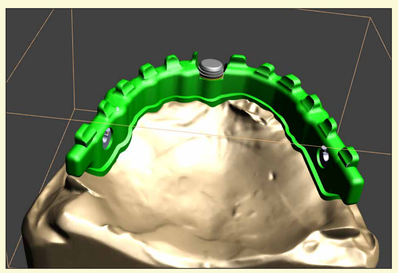

Fig. 9: Design of CAD/CAM secondary bar construction

Fig. 10: Milled CAD/CAM bar with try in splint

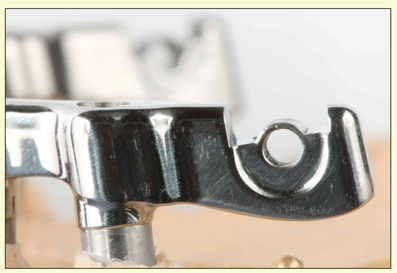

Fig. 11: Horizontal lock in CAD/CAM bar

Fig. 12: Final CAD/CAM bar placed in CAD/CAM milled removable bridge

Fig. 13: Final esthetic aspect on master model

Fig. 14: CAD/CAM bar in patient situ; frontal view

Fig. 15: CAD/CAM bar in patient situ; occlusal view

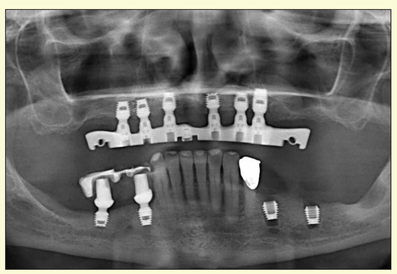

Fig. 16: Radiographic control of passive seat

Fig. 17: Final construction; occlusal view, horizontal locks open

Fig. 18: Final construction; occlusal view, horizontal locks closed