

# Immediate loading of two implants with a mandibular implant-retained overdenture – an innovative treatment protocol

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## Case Report

The patient was a 76-year-old male who had been edentulous for more than 40 years. He was wearing his 9th conventional full denture, which was 5 years old. The patient had retention problems with the lower denture due to a hypotrophy of the processus alveolaris inferior. The height of the mandibula in the foraminal zone was 25 mm and Cawood V–VI.

## Pre-operative treatment planning

Prior to the surgical stage, a new conventional full denture was manufactured with an optimal occlusal fit. The denture was checked in the patient's mouth finally, but not fitted. Pre-operative Straumann RN synOcta® 1.5 Screw-Retained Abutments, Straumann RN synOcta® Impression Caps for Bars and Straumann RN synOcta® Analogs for Bars were autoclaved in a sealed bag.

## Surgical procedure

The surgical procedure began with the planning of the implant position by drilling 2 small holes in the lower

denture with a round bur. The chosen position corresponded with the contact point between the lateral incisor and cuspid (Figure 1).

The lower denture was ready to use as a surgical template. The average distance between the two implants was 20mm (Figure 2).

Start of the surgical stage (at 08:00 a.m.). The edentulous lower jaw with Cawood V–VI (Figure 3). A local anesthetic was used for the intraforaminal zone. The lower denture with the drill guides was fixed in the mouth by hand. 2 small center points were drilled transmucosally with a round bur, and water cooled (Figure 4).

After the mucosal flap, two parallel holes with implant diameter and length were drilled at the exact positions indicated by the round bur (Figure 5).

The implants (Straumann® RN Standard Implant Ø 4.1 mm, SLActive, 12mm) were placed with a minimal torque of 35 Ncm. The typical "Straumann® SLActive effect" was visible: blood attached on the surface due to the hydrophilic properties (Figure 6).

With the Osstell™ mentor Instrument and a Smartpeg™ Type 4 for RN and WN the ISQ (Implant Stability Quotient) was measured at the level of the implant and of the Straumann RN synOcta® 1.5 screw-retained abutment. The abutment was screwed in with a torque of 25 Ncm. ISQ measurements were carried out in two horizontal directions: perpendicular and parallel to the arch of the jaw (Figure 7).

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Two sterilized Straumann RN synOcta® Impression Caps for Bars were placed and clicked on top of the abutments. The flap was closed and sutured with Seralon 5/0. There was no conflict between the suture and the impression (Figure 8).

The drilling holes were partially enlarged at the bottom side of the lower denture to obtain sufficient space for the impression caps and the impression (Figure 9).

The lower denture was filled with a medium viscosity impression (Flexitime Monophase) and a syringe used to apply the impression material around the impression caps. The denture was placed in the patient's mouth in a similar way as for a rebasing in central relation and full occlusion with the upper denture. The two drilling holes were marked with expressed impression material (Figure 10).

The result of the impression with the impression caps and a thin layer of impression material in the posterior

sides. The impression was then sent to the dental lab (Figure 11).

The patient was sent home (at 08:40 a.m.) with the healing caps over the abutments and expected to return at 04:00 p.m. (Figure 12).

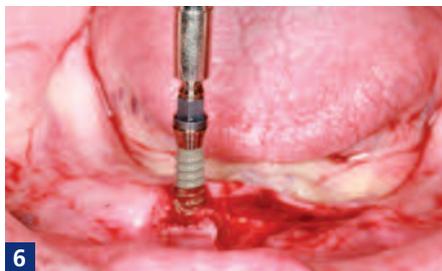
In the lab, a plaster model was made from the impression, on which the gold caps and the bar were fitted (Figure 13).

Through the drilling holes of the denture one could see that the implants are in the position according to the pre-operative planning (Figure 14).

The soldered bar was polished and placed on the model (Figure 15).

The clip was placed on the bar and the denture was ready for the rebasing. The clip was activated for retention (Figure 16).

The final result: a mirrored image of the overdenture with the clip and the bar with the gold caps positioned on two Straumann RN synOcta® Analogs for Bars



(Figure 17).

The bar was installed in the patient's mouth (at 04:00 p.m.), with almost no visible swelling (Figure 18).

At 04:10 p.m., the patient was able to eat with his new implant-retained overdenture (Figure 19). He was instructed not to remove the overdenture until the appointment next day and to avoid very hard food for the first 2 weeks. The next day the patient was given instructions on the removal and installation of the overdenture. For the first 5 days chlorhexidine 0.12%

was used 4 times a day. In most of the cases no antibiotics were prescribed and standard painkillers could be used by the patient when necessary. The sutures were removed after 2 weeks.

**Results of the clinical trial**

More than 90 patients are currently being treated according to this new protocol. The evaluation of 69 patients shows a survival rate of 98.6 %. Only two implants have been lost, which can be attributed partly to the learning curve. This is comparable to procedures





based on delayed loading. In the clinical trial the ISQ measurements at abutment- level were made at Tx = 0, 2, 4, 6, 8 and 13 weeks. The ISQ values remained at a stable level during osseointegration.

Patient satisfaction increased due to less pain, swelling and pressure spots of the new overdenture, in comparison with the traditional procedure. Since the patient experiences the benefits of the implants and the perfect retention directly, his attitude is more positive and it is easier for him to cope with the new

overdenture. Although the new overdenture was installed directly on the wound after surgery, none of the patients needed a rebasing in the first year.

This new treatment protocol offers possibilities to solve retention problems for edentulous patients with new or existing lower dentures. The present case indicates that the "Straumann® SLActive in one day" protocol can be beneficial to both the patient and the dentist.

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