

Dr. Thomas Faber
Barnt Green Dental Centre

Replacement of an implant retained overdenture utilizing 3D scanning



Solutions featured:

3Shape TRIOS 3 intraoral scanner



Fig. 1

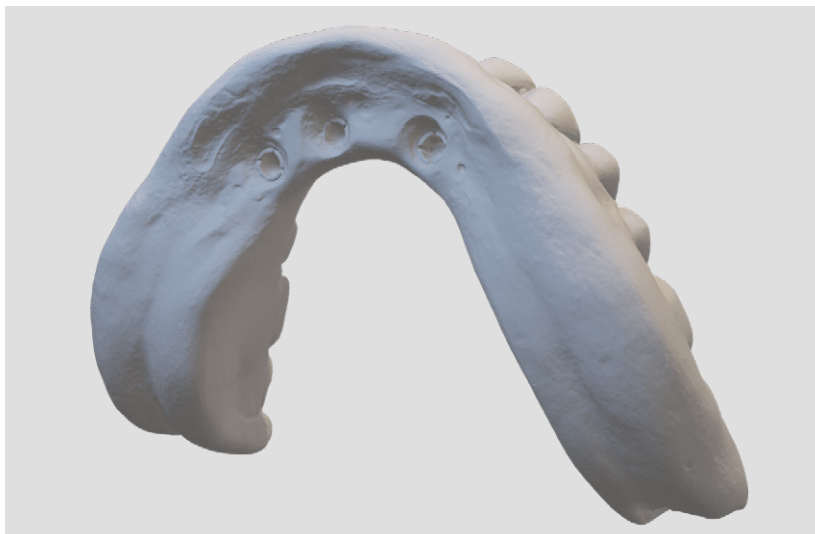


Fig. 2

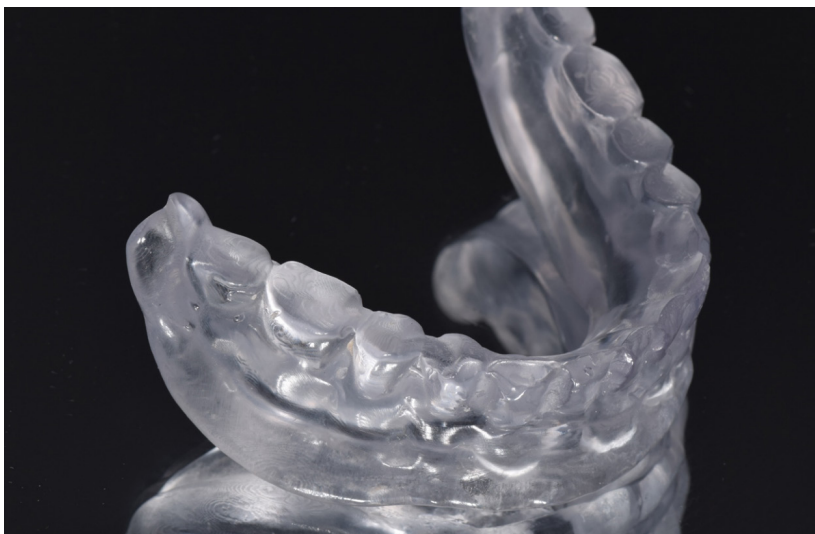


Fig. 3

Case information

The patient, a 75 - year old female, is in good general health. The patient is mainly interested in a new denture. Her existing denture was more than 15 years old and she wanted to feel safe that her denture would not fail while out travelling. Over the years the denture teeth had also discolored and become worn.

The patient was also looking to achieve improved retention of the new lower denture. In summary, the patient's expectations were functional and aesthetic improvements while at the same time, expecting an equally good or better denture fit.

Case considerations

The patient's existing denture still fitted well and did not cause any soreness or pressure sensitivity. The three existing (Straumann) implants in the anterior mandible were placed in the late 1980's with the overdenture connected via ball-attachments. The patient's alveolar ridge in the mandible was almost completely lost with the mucosal and gingival tissues being a very thin biotype.

Treatment plan

Ball attachments. (Fig 1)

Model of existing denture created from 3Shape TRIOS intraoral scan. (Fig. 2)

3D printed copy of existing denture used as special impression tray and to record the bite. (Fig. 3)

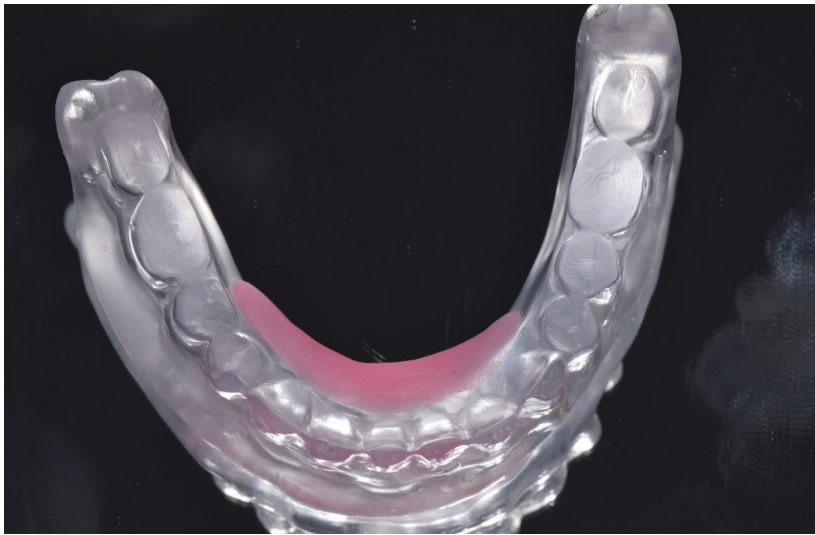


Fig. 4

Impression taking and bite registration: This 'special tray' can easily be amended with light cured tray material, where required. (Fig. 4)

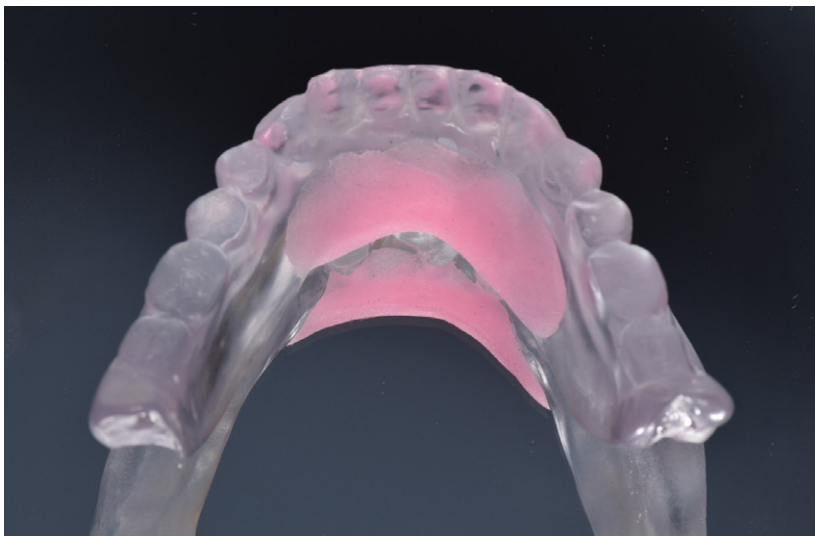


Fig. 5

Anterior lingual amended for improved fit. (Fig. 5)



Fig. 6

Precision functional impression achieved using a medium viscosity silicone impression material.

At this stage a lot of chair-time is saved because of the precise fit of the 'special tray' with little or no adjustments required. (Fig. 6)



Fig. 7

Patient bite appears over-closed. (Fig. 7)



Fig. 8

To address the problem, the bite for the new denture is raised slightly by placing a jig on the central incisors to open the bite by approx. 2mm. The bite is recorded with a bite-registration silicon. In this way, the bite can be recorded easily and precisely. (Fig. 8)



Fig. 9

The precise fit of the 3D-printed model of the opposite teeth is verified and confirms the precision of the scanned and printed model. Extensive chair-time is saved because of this easy, quick and precise way of recording the bite - as opposed to using a bite-block made of wax. (Fig. 9)

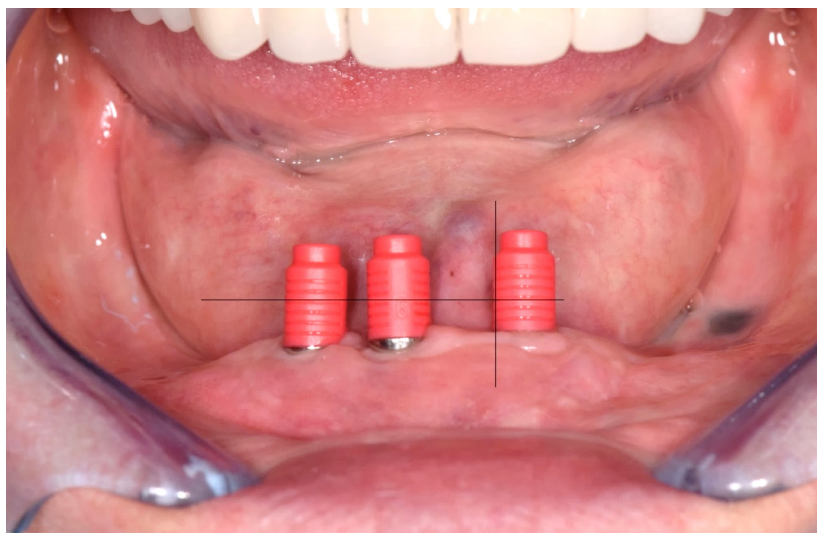


Fig. 10

I planned to replace the old ball-attachments with Novaloc® attachments (Straumann). For optimal retention and patient comfort, the new attachments should be level – vertical differences between the implants should be compensated by choosing different lengths for their abutments. To find the ideal length for the new attachments, the existing ball attachments were removed temporarily, and the Novaloc Plan Abutments were placed to determine the optimum abutment length for each implant. (Fig. 10)

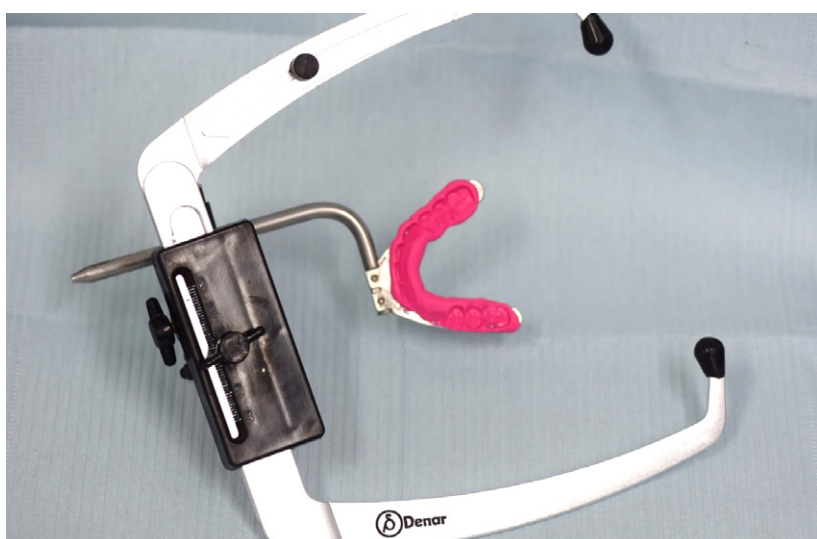


Fig. 11

A facebow is also used. (Fig. 11)



Fig. 12

Precision mounting of the models. (Fig. 12)

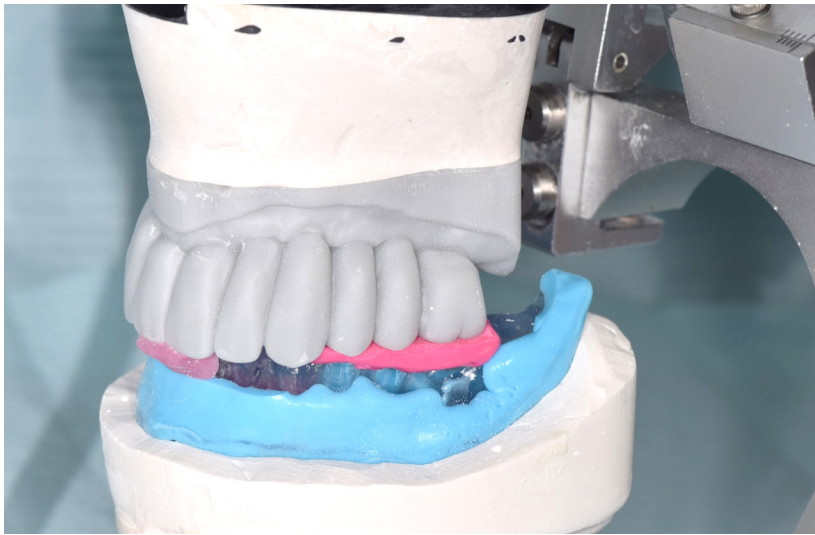


Fig. 13

Model mounted in the articulator. (Fig. 13)



Fig. 14

Tooth setup achieved with confidence. (Fig. 14)



Fig. 15

Wax try-in. (optional) (Fig. 15)

At this stage, a lot of chair-time has already been saved, because little or no time was used for the bite registration (as opposed to using a wax bite-block). Adjustments at try-in have also been avoided, as were re-tries.



Fig. 16

Fitting of the attachments - attachment matrices and overdenture. The finished denture. (Fig. 16)



Fig. 17

(Finished denture. Fig. 17)



Fig. 18

Novaloc® abutments fitted into the implants with the appropriate torque (35Ncm). (Fig. 18)



Fig. 19

Attachment matrices fitted to the denture. The required spaces carefully created by the dental laboratory. (Fig. 19)



Fig. 20

Abutment matrices fitted. (Fig. 20)



Fig. 21

Resulting denture fits comfortably in patient's mouth with no movement. (Fig. 21)



Fig. 22

Perfect bite, with little or no bite adjustment required. (Fig. 22)



Fig. 23

Happy patient. (Fig.23)

Benefits of the digital workflow

To create a new denture from scratch that meets patient expectations can be very time consuming. If the patient's expectations are not met in full, it can often lead to frustration.

With conventional methods, it is nearly impossible to create a precise copy of the patient's existing denture. Particularly, if the patient is not willing or able to be without the existing denture for any length of time.

Using the digital workflow that I have developed, where a 1:1 digital copy of the existing denture is created at the beginning of the workflow simplifies the procedure. In this workflow, the 3-D printed copy of the existing denture is used as both a special impression tray and bite block.

The workflow guarantees that the base of the new denture will have the correct extension of the margins (adjustments are possible where needed and easily achieved) and will therefore, fit as well as the patient's old denture, or better from the very beginning. This serves to avoid soreness from pressure ulcers. In addition, with this workflow, the precise bite registration is easily achieved with predictable results.

The resulting denture becomes very predictable and extensive time is saved by avoiding mistakes and the resulting corrections using this simplified workflow.

About Dr. Thomas Faber

As a student of dentistry and post-graduation, Dr. Faber has benefitted and been influenced by his father. A pioneer in dental implantology, Dr. Faber's father began placing dental implants in the 1970's: At a time when implant retained tooth restorations were not a generally acknowledged treatment option.

Because of this, Dr. Faber has had the fortunate position of having experienced and performed dental implants since their initial stages of development.

Dr. Faber is interested and experienced in implant-treatments in the aesthetic zone and the related management of bone and soft tissue. Since acquiring a 3Shape TRIOS[®] 3 intraoral scanner and software for restorative work, implantology and orthodontics, he has become increasingly interested in the benefits of digital workflows.

Dr. Faber is a frequent lecturer and enjoys the fine arts as well as cycling, skiing, and being out in nature.

About 3Shape

3Shape is changing dentistry together with dental professionals across the world by developing innovations that provide superior dental care for patients. Our portfolio of 3D scanners and CAD/CAM software solutions for the dental industry includes the multiple award-winning 3Shape TRIOS[®] intraoral scanner, the 3Shape X1[®] CBCT scanner, as well as market-leading scanning and design software solutions for both dental practices and labs.

Two graduate students founded 3Shape in Denmark's capital in the year 2000. Today, 3Shape employees serve customers in over 100 countries from 3Shape offices around the world. 3Shape's products and innovations continue to challenge traditional methods, enabling dental professionals to treat more patients more effectively.

Let's change dentistry together

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