ELOS MEDTECH

CLINICAL CASE REPORT

ANTERIOR IMPLANT REHABILITATION WITH A COMPLETE OPEN DIGITAL WORKFLOW

Michael Braian,
DDS.CDT.Phd,
Baltzar Tandvård

All roads lead to Rome

This case describes a digital strategy to achieve a predictable final result.
Fifty-year-old patient who had problems with 11 for several months. When she realized that the problem would not go away by itself, she contacted the clinic for an examination.

Treatment at a glance

1. Design and manufacture of a Maryland Bridge, visualization guide and a printed model with a palatal cylinder.
2. Extraction of 11 followed by instant bonding of Maryland Bridge to 22.
3. After 5 weeks of healing with full soft tissue coverage, a tapered Straumann RC implant was installed at the bone level with bovine bone and membrane in the buccal aspect.
4. After 6 months of healing, second stage surgery was preformed and a provision was created using the cylinder model. An intraoral scan was taken with the Elos Accurate® Scan Body.
5. An implant crown was designed on Elos Accurate® Hybrid Base™ Non-Engaging and printed in provisional material.
6. After a month of soft tissue healing, the final crown was manufactured in monolithic full anatomical translucent zirconia.

Elos Accurate® products used in this case:


Fig. 1

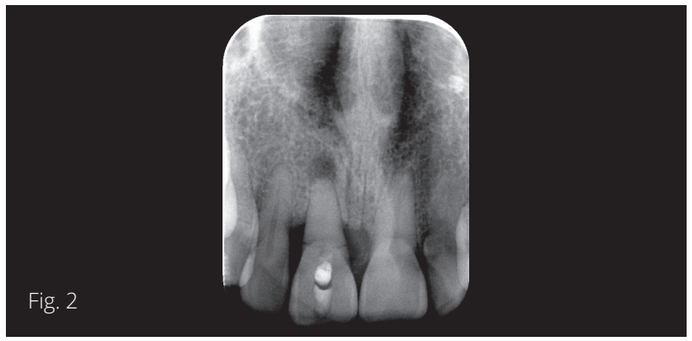


Fig. 2

Fig. 1 - 3
The examination revealed an apical lesion, fractured tooth, and a fistula in the buccal aspect. (Fig 1-3).

Biological considerations
- No buccal bone
- Reduced vertical bone dimension
- Soft tissue inflammation

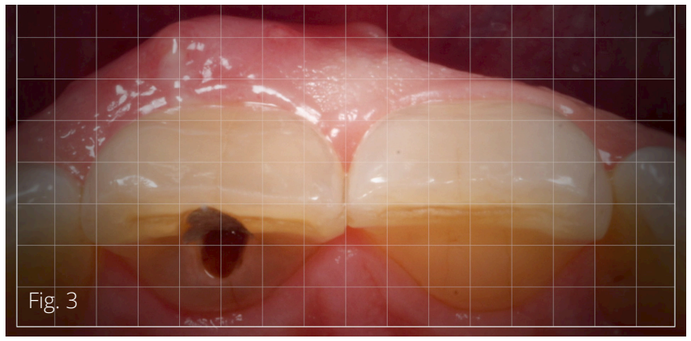


Fig. 3


Fig. 4


Fig. 5

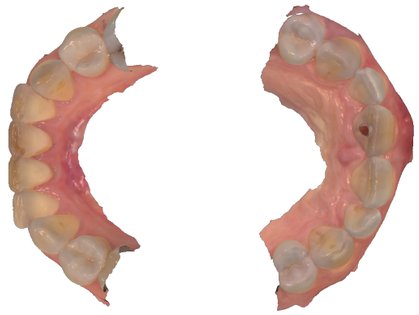


Fig. 6

Fig. 4 - 5
Aesthetic considerations:
- Rectangular shaped teeth
- Low lip line (Fig.4)
- Blunt papilla, medium to thick biotype (Fig. 5)
- Low patient expectations

During the first examination, an intraoral scan was taken utilizing a Trios III. This first intraoral scan was later used for several purposes.
- Examination of occlusal relations
- Tooth 11 is digitally removed, and a Maryland Bridge is designed as a provisional
- A cylinder is placed in the palatal aspect of 11 in order to manufacture a printed model that later was utilized to make a provisional during second stage surgery
- A visualization guide is designed and printed in order to help the surgeon visualize the correct implant angulation during surgery.
- With the latest Implant Studio Software from 3Shape and Exoplan it is possible to utilize this first intraoral scan together with a CBCT to plan both the implant placement and the provisional. This case was treated prior to the release of the two latest software.

Design and manufacturing of a Maryland Bridge, visualization guide, and a printed model with a palatal cylinder.

Fig. 6 - 15
Scan of upper, lower and bite registration and design in exocad.

Fig. 8

Fig. 9

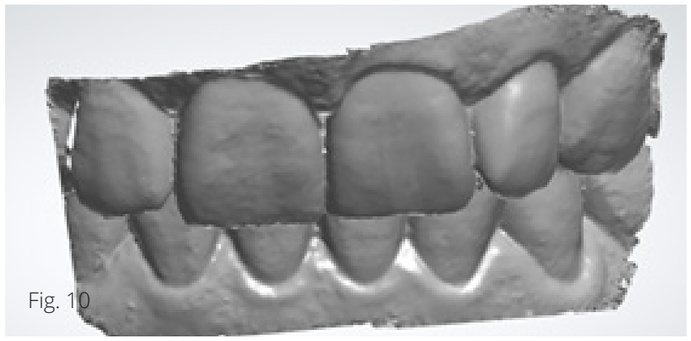


Fig. 10

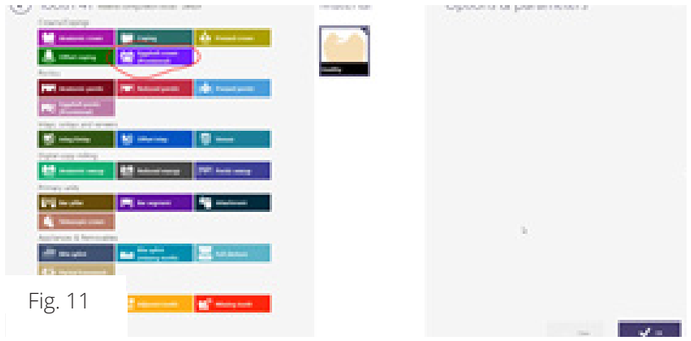


Fig. 11

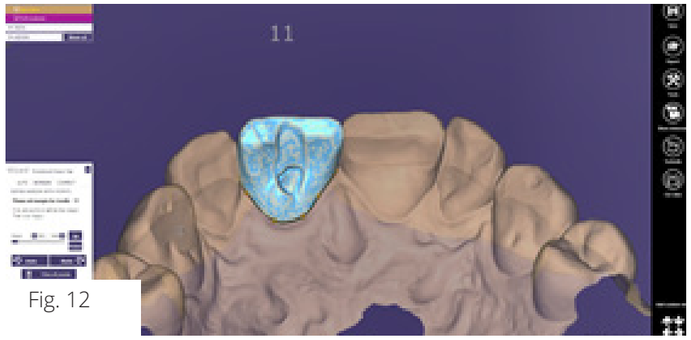


Fig. 12

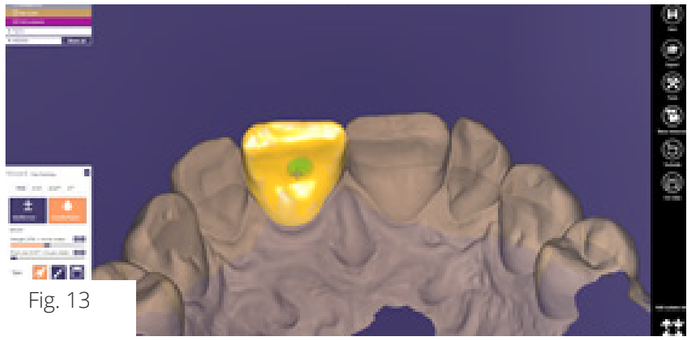


Fig. 13

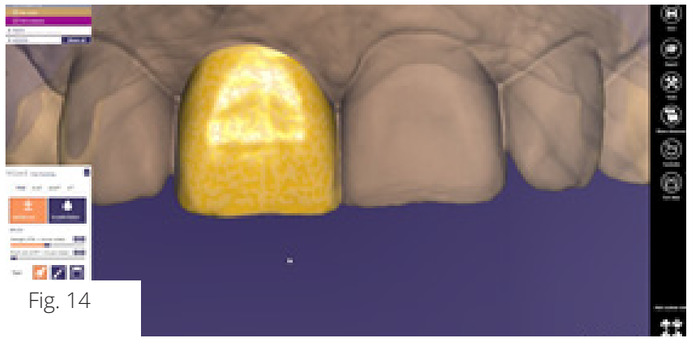


Fig. 14

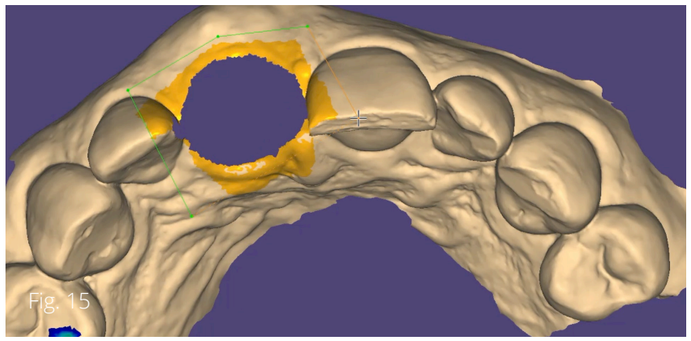


Fig. 15

Fig. 11 - 15
Virtual extraction of tooth 11

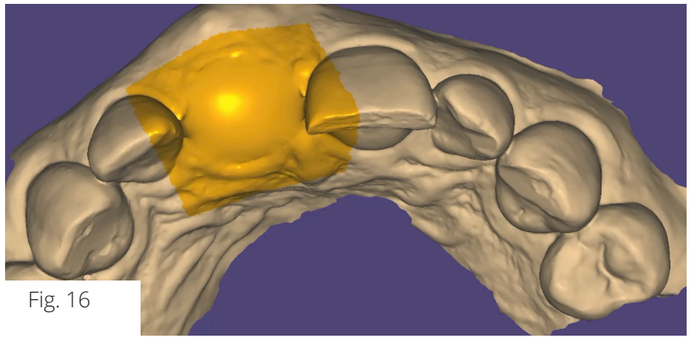


Fig. 16
Tooth 11 is digitally removed; (Fig.16) the socket is modified to mimic a drip-shaped soft tissue contour.

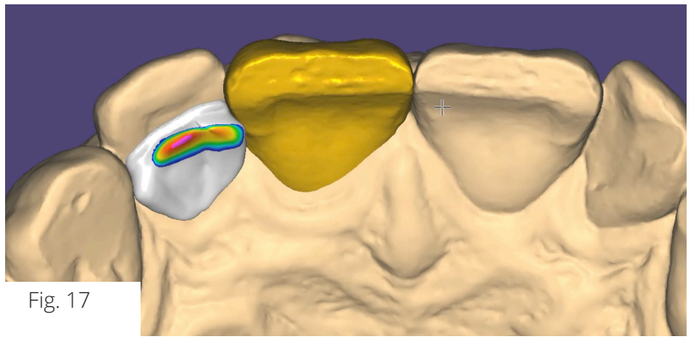


Fig. 17
A Maryland Bridge is designed with a wing attached to the palatal aspect of 12.

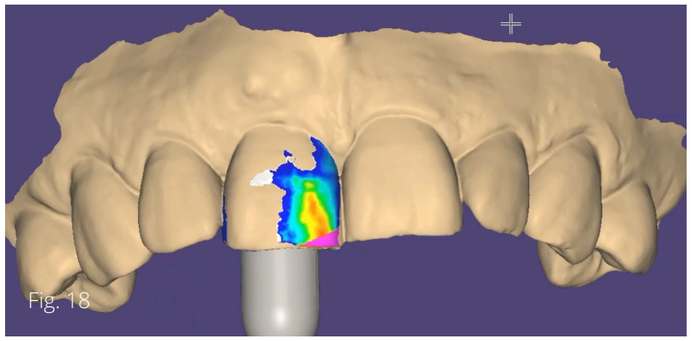


Fig. 17
Cylinder model.
When designing the bridge, it is important to stay clear of the distal papilla, if the design of the connector is too thick it will put too much pressure on the papilla.
Meanwhile the same scan was used to place a cylindrical geometry on the palatal aspect of 11 in order to simplify the production of a provision in the second stage surgery. The diameter of the cylinder is approximately 6 mm.

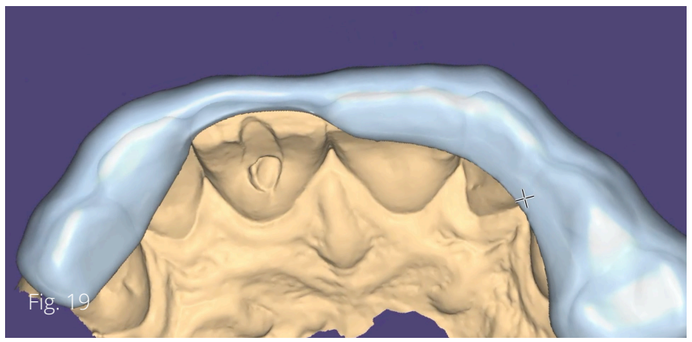
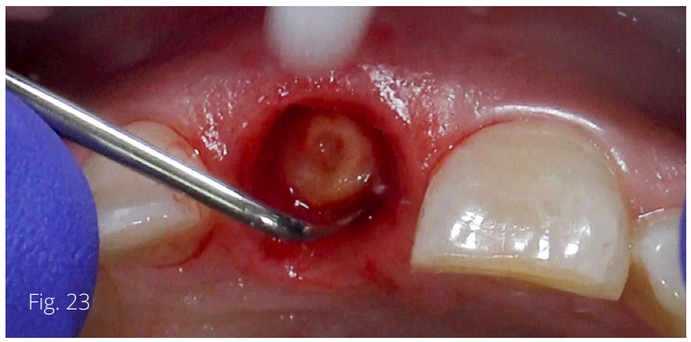


Fig. 18
Instead of a surgical guide, we designed and manufactured a visualization guide that limits the surgeon from passing the incisal edge of the viritally placed central. This type of guide only limits the buccal angulation of the implant.

Fig. 19-27
With the latest Implant Studio Software from 3Shape and Exoplan it is possible to use this first intraoral scan together with a CBCT to plan for both implant placement and the provisional. This case was treated before the release of the two latest software.
This procedure starts by cleaning tooth 12 in order to prepare the site for the post extraction bonding procedure.

Fig. 21
Careful extraction of 11 utilizing a periotome tool.

Fig. 22-25
Thoroughly cleaning of the socket. Socket protection to avoid bonding agents from entering. Enamel bonding of Maryland Bridge to the palatal aspect of 12.



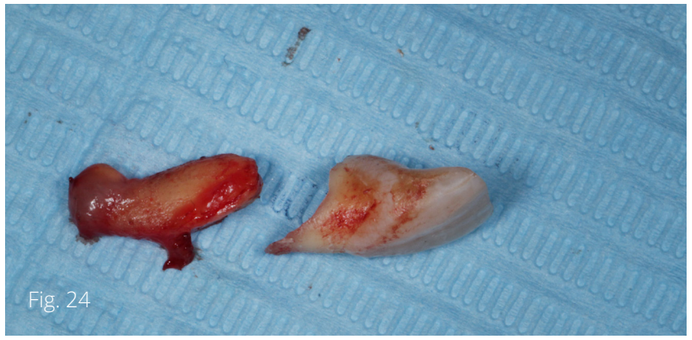


Fig. 24


Fig. 25


Fig. 26

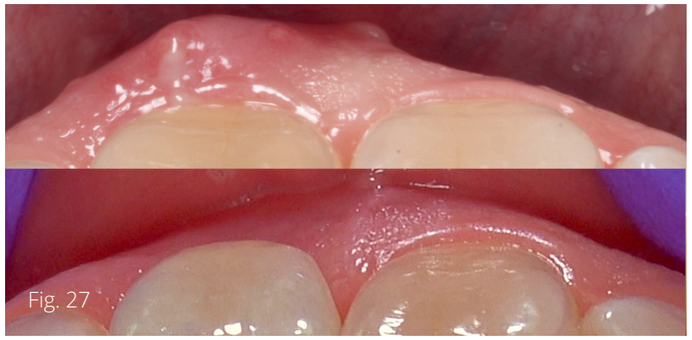


Fig. 27

Fig. 26 -28
Care is taken to avoid excess cement from entering the papilla region.


Fig. 28

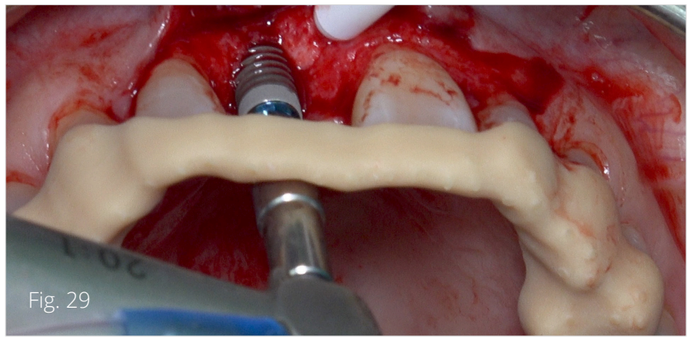


Fig. 29

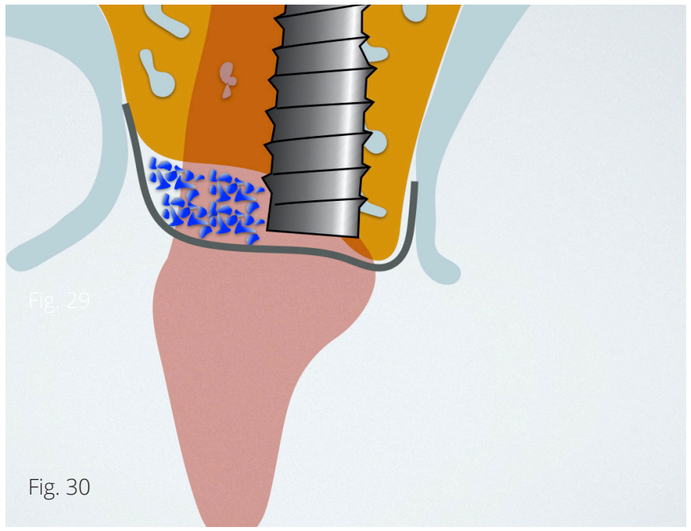


Fig. 30

Fig. 28-31
After 5 weeks healing with full soft-tissue coverage and absence of acute infections, a total soft tissue collapse could be seen in the buccal aspect of the site (Fig. 28 and 29). After conducting a full thickness flap with lateral vertical incisions, the site is prepared for a Straumann Bone Level Tapered RC implant. With the guidance of the visualization guide the implant is seated in the palatal aspect, with a favourable incisal angulation (Fig. 30). In conjunction with implant placement, bovine bone together with bone chips were placed in the buccal aspect of the implant, the site was covered with a resorbable membrane and full coverage saturation (Fig. 30).
After 6 months healing, second stage surgery was conducted, and a provisional was made with the help of the cylinder model. (Fig. 17).

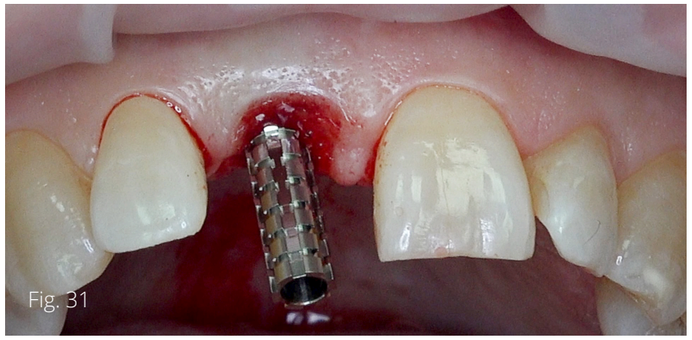


Fig. 31


Fig. 32

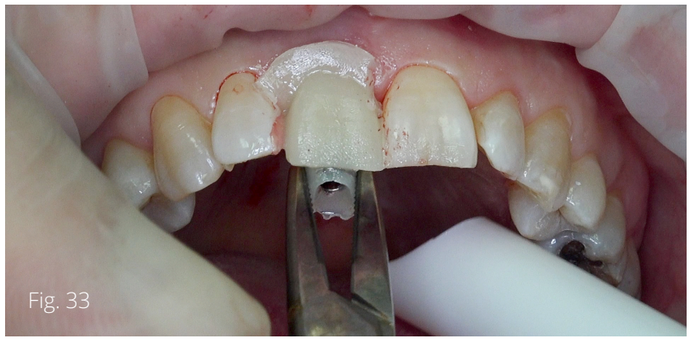


Fig. 33


Fig. 34

Fig. 31-36
The cylinder design (Fig. 17) was utilized to 3D print a model. Using a putty template, the design was transferred with temporary material onto a temporary abutment (Fig. 31). Soft tissue contouring was utilized on the provisional for optimal soft tissue support and contouring (Fig.33-66). During the same appointment, one intraoral scan was conducted using Elos Accurate® Scan Body, this scan was later used to design the final crown, or in this case a provisional crown (Fig. 36).


Fig. 35


Fig. 36


Fig. 37

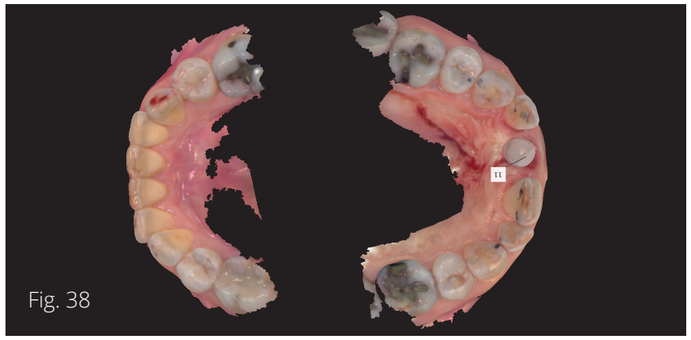


Fig. 38

Fig. 39

Fig. 39 - 41
Second scan of upper and lower and bite registration.

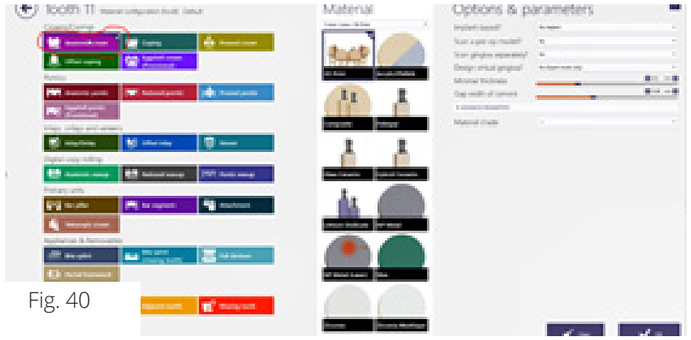


Fig. 40

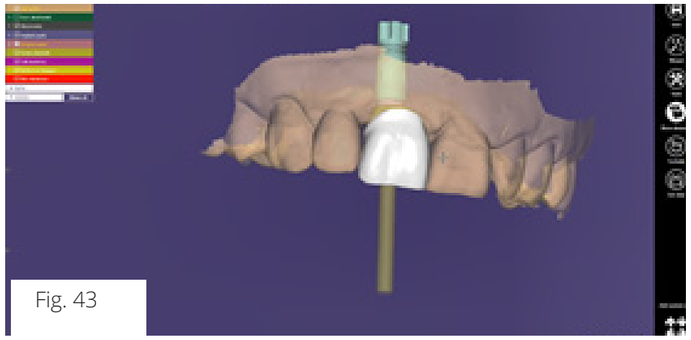


Fig. 43

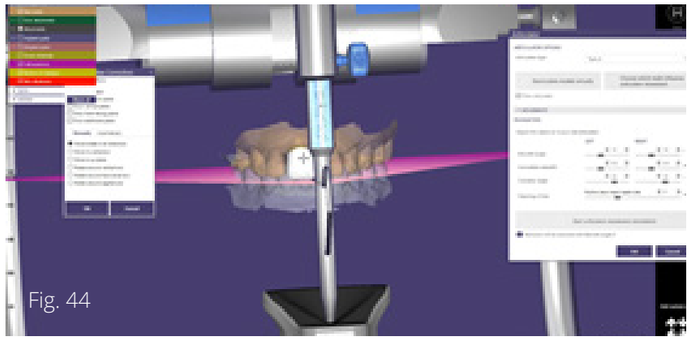


Fig. 44

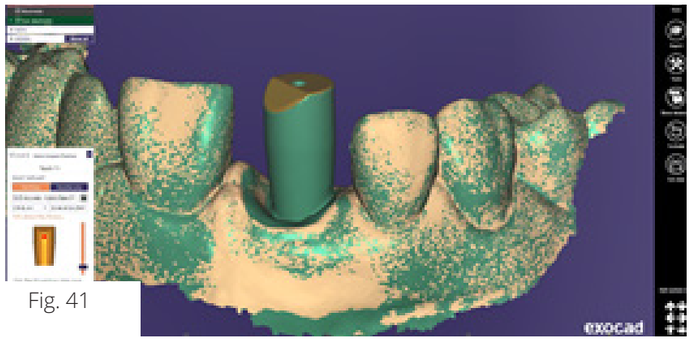


Fig. 41

Fig. 41 - 48
An implant crown was designed on Elos Accurate® Hybrid Base™ Non-Engaging, and printed in provisional material.
After 4 weeks the soft tissue has started to mature around the provisional made during second stage surgery. After the second stage surgery, one provisional crown is designed digitally in order to guide the soft tissue to mature even better

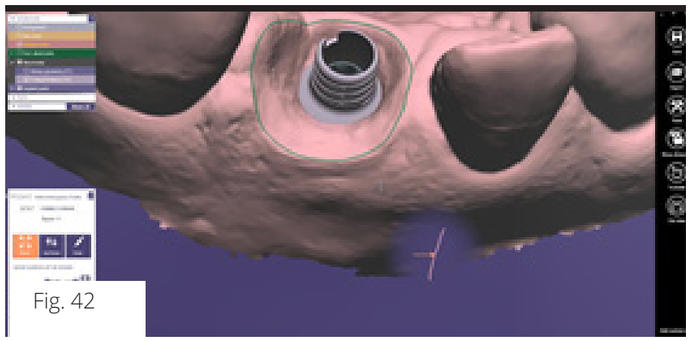


Fig. 42

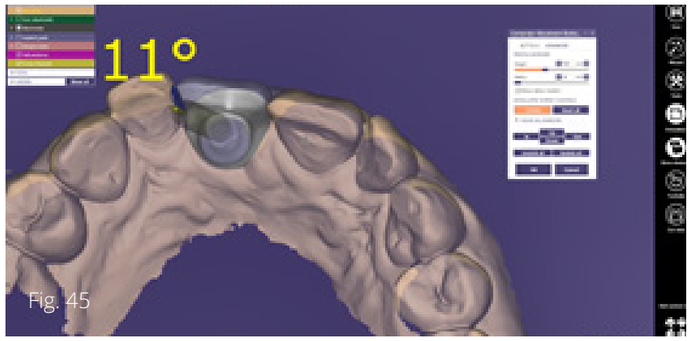


Fig. 45

Fig. 46

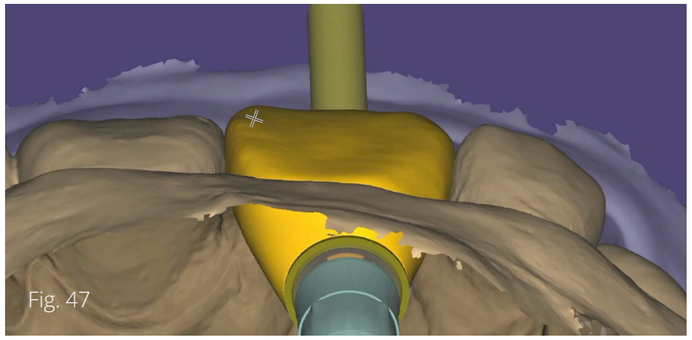


Fig. 47

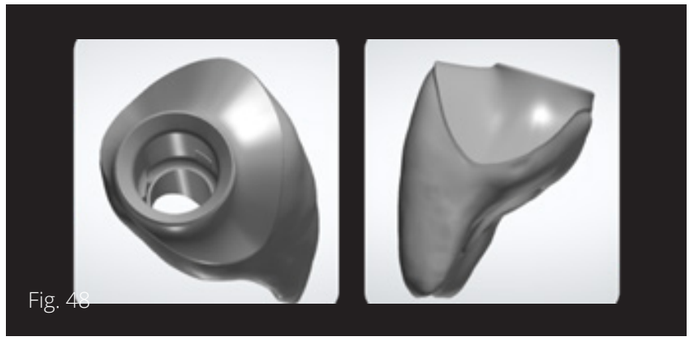


Fig. 48

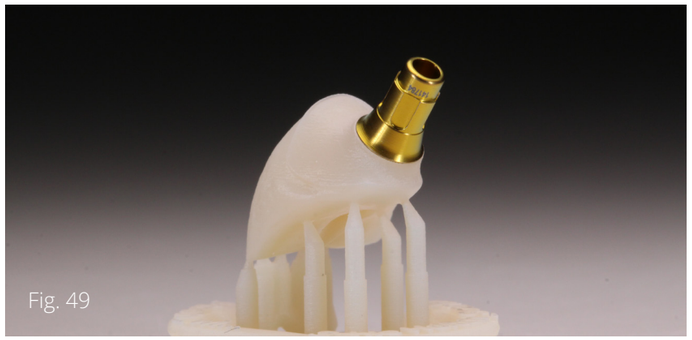


Fig. 49

Fig. 49
The crown is 3D printed in provisional material and bonded to an Elos Non-engaging hybrid base


Fig. 50


Fig. 51


Fig. 52

Fig. 52 - 53
Crown painted with GC colors and GC Optiglaze™


Fig. 53


Fig. 54

Fig. 54 - 59
After 1 month of soft-tissue healing the final crown was manufactured utilizing the same design as for the provisional. The crown was manufactured in monolithic full anatomical translucent zirconium dioxide.

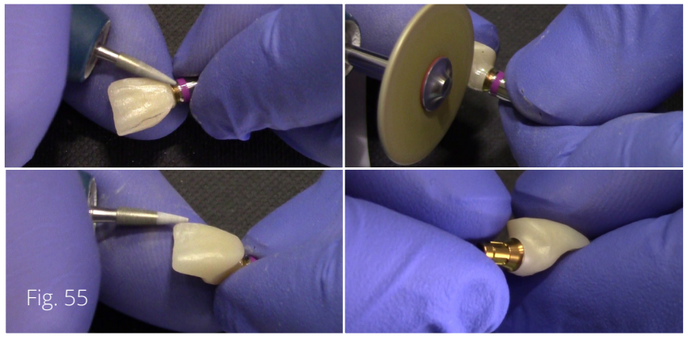


Fig. 55

One year post operation check-up revealed some papilla reduction on both sides of 11, meanwhile the buccal aspect of the soft tissue remained stable. (Fig. 58)

Finalizing structure and small colorizations made for installing the final crown. (Fig. 55)

Installation of the screw-retained crown, (Fig. 56) and X-ray after crown installation (Fig. 57).

X-ray summary from start to goal (Fig. 59).


Fig. 56


Fig. 57


Fig. 58


Fig. 59


Fig. 60

Fig. 60
Final picture and follow up after 1 year of healing time.

Notes

Notes

Thank you for your contribution:

Michael Braian , Baltzar Tandvård

Michael has dedicated his entire adult life to the prosthetic mystery of dentistry. In 1999 he started his dental education at Malmö University, and since then Michael has graduated as a dental technician, dentist and, in 2018, he defended his dissertation in digital dentistry. Michael's focus over the past 10 years has been entirely on digital opportunities in dental care. In 2014, he decided to realize a long standing dream, which saw Michael establishing a private clinic where he serves as both a dentist and a dental technician from start to finish in all patient cases. Michael has received several awards for his educational skills.

BALTZAR TANDVÅRD

021.604_rev 1

Curious for more? Contact us at dentalsupport@elosmedtech.com or go visit:

elosdental.com
shop.elosmedtech.com
elosmedtech.com