



dismantling myths and creating realities

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1_ *Clinical view of failing dentition with progressive bone loss in spite of the high degree of oral hygiene*

2_ *Panoramic radiograph*

3_ *Three-dimensional view generated from a CT scan with ExpertEase providing information critical to the planning.*

4_ *Cross-sectional view of central incisor. Interactive planning for the insertion of an implant at the required position.*

INTRODUCTION

Advances in hardware and diagnostic tools have resulted in the dismantling of many of the protocols that were an integral part of implant dentistry.

It is now possible for a patient to come in for treatment with failing teeth and leave the surgery with implant-supported teeth fitted on the same day the failing teeth were removed. This is extremely attractive for patients who often wish to avoid long and protracted treatments.

It is equally important to ensure that the teeth emerge from naturally contoured soft tissues and that this goal is achieved with a high degree of predictability allowing for a stable long-term outcome.

KEY FACTORS

However, certain requirements need to be met to ensure an optimal treatment result. These are:

- Thorough clinical assessment of patient addressing bone and soft tissue biotypes
- Accurate 3-D diagnostic imaging and appropriate interactive software (ExpertEase, DENTSPLY Friadent, Mannheim, Germany)
- The use of implants with the required features to achieve stability
- A range of prefabricated abutments and connection interfaces that allow the correct abutment to be selected and attached during implant placement
- Clinical and technical protocols based on experience and sufficient clinical data

CASE PRESENTATION

The following description presents the two-year follow-up of an Ankylos case. The procedure was planned using the then newly introduced ExpertEase Software. Based on the data gathered with the planning software, a provisional bridge was fabricated in order to facilitate immediate restoration. SurgiGuides (Materialise) and the conventional Ankylos instrument kit were used to implant the Ankylos plus implants. Today, ExpertEase Guides and the ExpertEase Sleeve-on-Drill drilling system with pre-mountable sleeves make the surgical procedure considerably easier. The drills are safely guided and the drill stop system monitors the exact depth of drilling. In this case, the patient was referred because of her periodontal status resulting in progressive bone loss, increased mobility and severe sensitivity. Previous protracted periodontal therapy had left the patient eager to avoid staged treatment involving augmentation.

The treatment was chosen taking various criteria into consideration:

- Adequate bone for primary stability
- A hard and soft tissue biotype that will permit stable tissue after treatment
- No acute pathology
- Favorable soft tissue architecture

CLINICAL TREATMENT

The clinical management of the patient required thorough preoperative planning in order to ensure an optimal result that also met the patient's expectations. A detailed clinical examination formed the first part of the treatment process followed by gathering all additional information (Figs. 1 and 2). This includes information about the jaw relationship and three-dimensional diagnostic imaging.

3-D DIAGNOSTIC IMAGING AND INTERACTIVE PLANNING

After completing a careful diagnostic assessment of the available bone volume and density, the treatment was planned using cross-sectional images to interactively position the implants with the ExpertEase software. The position of the implants was refined in the 3-D view ensuring that the implants are placed in the correct position to achieve an esthetically and functionally perfect outcome which can be reconstructed in the actual jaw (Figs. 3 to 5).

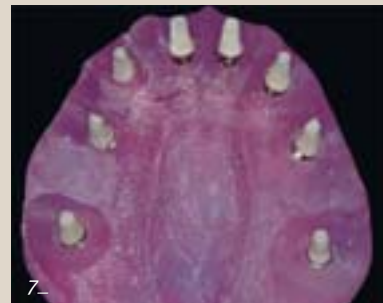
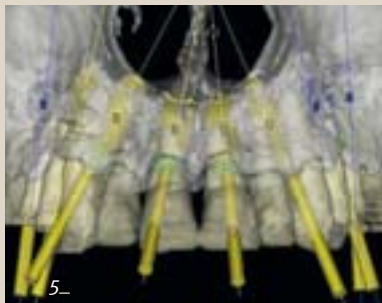
The data gathered was sent off for the guide manufacturing. A stereolithographic model already showing the planned osteotomies was built.

5_ Three-dimensional view used to refine implant position.

6_ Surgical guide positioned on a study cast to confirm accurate fit. The lateral incisors and first molar will be used for stabilizing the surgical guide.

7_ Stereo lithographic model showing abutments in situ as well as parallel acrylic sleeves.

8_ Mounted study casts with hollow acrylic transitional restoration.



TECHNICAL ASPECTS

The study casts mounted on a semi adjustable articulator are used to fabricate the transitional restoration from acrylic, which is hollow and will receive the abutments in the prescribed position.

Information is transferred between study casts and the stereolithographic model. Implant analogues are inserted into the prepared osteotomies model which has been designed interactively. The accurately prefabricated angled abutments are selected which fit into the prosthetic envelope defined by the transitional restoration and at the same time are parallel to each other. Acrylic sleeves were constructed and connected to the transitional restoration to compensate for tolerances that are inherent in the planning process (Figs. 6 to 8).

SURGERY

Surgery was carried out by first extracting the selected teeth. Three teeth were retained to provide support for the surgical guide. The osteotomy was prepared following the surgical protocol. Ankylos implants were inserted to a specific depth and in relationship to the socket level.

The abutments were transferred one by one from the stereolithographic model. The acrylic sleeves were seated on the abutments and the hollow acrylic transitional bridge connected to the sleeves, which fit accurately on the abutments, using self curing resin. Seating of the bridge was facilitated by the opposing jaw. The bridge was removed on completion of polymerization, the margins refined and cemented using a very small amount of temporary cement to prevent any excess (Figs. 9 to 12).

9_ Ankylos implants inserted using a tooth-supported surgical guide generated from CT scan data. Note the position and angulation of the carriers.

10_ Abutments inserted and aligned. These are now ready to receive the acrylic sleeves for the connection of the hollow acrylic transitional bridge.

11_ Transitional acrylic bridge in situ positioned at the time of implant insertion.

12_ Transitional acrylic bridge, three months after implant insertion showing stable and mature gingival tissues ready for the restorative phase.





13_Clinical view of the abutments after removal of the transitional bridge prior to taking impression for the definitive restoration.

14_Labial view of the definitive restoration. Please note soft tissue contours and emergence profile.

15_Periapical radiograph taken one year after completion demonstrating bone levels above that of the implant. The peak of bone visible between the implants and above the level of the shoulder provides support for the soft tissue contours of the interdental papilla.

16_Labial view of the definitive restoration two years after completion showing stable soft tissues.

17_Periapical radiograph taken two years after completion showing stable bone supporting the soft tissues seen in the previous image.

DEFINITIVE RESTORATION

The definitive metal ceramic bridge was constructed three months later. This allowed for integration and soft tissue maturation. A cement retained bridge was constructed and fitted. Appropriate documentation using clinical photography and radiographs was carried out in order to monitor the results (Figs. 13 to 17).

SUMMARY

The concept of attaching the definitive abutment to the implant is well documented at the time of second stage surgery. This data was published in 2002 with 15 years of follow-up. However, when immediate loading is planned, an abutment must be attached to the implant. Immediate placement and simultaneous loading has become predictable due to the advent of implant designs creating optimal insertion torque and primary stability. Therefore, a range of prefabricated abutments, which cover most of the angles likely to be used, is vital. A non-indexed

connection (a tapered connection) permits the abutment to be rotated to achieve alignment. This avoids the need to rotate the implant with its consequences on primary stability. ■



(from left to right)

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