GUIDED SURGERY WITH A SOFT TISSUE GRAFT (PAGES 22 AND 23)

Author: J. Pinheiro Torres
Publication date: 1 June 2017

Minimally invasive surgery in a highly demanding case

Since the introduction of guided surgery as a tool for implant placement, the principles have not changed significantly; the clinical results have. Initial studies reported a considerable number of technique-related perioperative complications; reasonable mean accuracy; and relatively high maximum deviations[1–8]. These studies concluded that guided surgery was advisable only in favourable situations[9, 10]. On the other hand, the 2015 EAO Consensus Conference found that, providing certain preconditions are met, guided surgery can provide higher levels of accuracy than free-hand procedures. According to the Consensus Conference, guided surgery may be indicated for complex anatomical cases; minimally invasive surgeries; aesthetic optimisation; and immediate loading[11].

This shift in our perception of guided surgery has occurred mainly because of how it is used and by whom. Guided surgery was originally introduced as a technique which could be used by any clinician, no matter what their level of expertise. In reality, however, high levels of surgical skill and experience are essential requirements for success and accuracy[9, 10].

Different approaches are described in the literature for replacing buccal volume shrinkage concerning hard and soft tissues which have been lost due to bone resorption[12]. There are a variety of options for soft tissue augmentation, and although soft tissue matrices are available in many different materials, autogenous materials generally provide the best results[19]. They are more predictable; exhibit long-term stability; have a shorter healing period; and allow immediate provisionalisation[13, 14]. They are probably the best option for horizontal tissue augmentation[15, 16].

Initial situation

The patient was a 16 year-old girl. She was congenitally missing a right lateral incisor (agenesis) and had a small left lateral incisor (microdontia) which had been restored with resin (Figures 1–3). This gave her low self-esteem and kept her from smiling. It was a very challenging case due to the age of the patient and her expectations about aesthetic outcomes.

Treatment plan

One year of orthodontic treatment was necessary to make space for tooth 12 and to enlarge mesiodistal distance for tooth 22. A skeleton maturation analysis and symphysis enclosing is also mandatory to start implant therapy, confirmed by an x-ray of the left wrist (Figure 4).

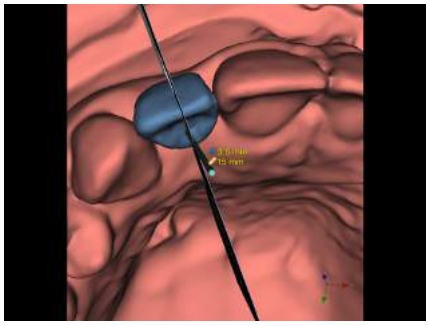
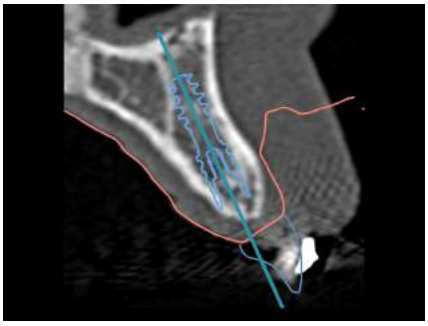
Guided surgery using a pilot-drill surgical template (Nobel Biocare) was the technique selected for its accuracy and because it is a conservative procedure. It was decided that a tunnel technique would be performed[17, 18] through the drilling access using micro-surgical techniques and a connective tissue graft would be placed to compensate for buccal volume recession.

Immediate provisionalisation would follow implant insertion, along with the connective tissue graft. The treatment plan also proposed a gingivectomy to augment the length of tooth 22. A ceramic/zirconia crown was selected to correct the congenital defect. An implant-supported ceramic/zirconia crown would also be used for tooth 12.

Implant therapy

After orthodontic treatment, it is important to identify the challenges that must be dealt with before commencing implant therapy: in this case, the insufficient distal papilla at tooth 11 and the lack of buccal volume caused by the absence of tooth 12 (Figures 5 and 6).


1. Guided surgery plan: Due to space restrictions, a pilot-drill template for a 2mm diameter drill was chosen for the procedure. Only a single drill was required for the 3.5x15mm implant. The cast and wax-up could be digitalised to maximise accuracy and optimise placement (Figures 7 and 8).

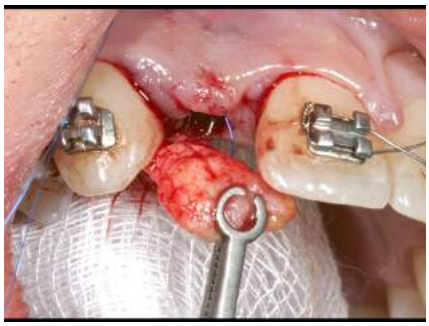
2. Implant placement: After adjusting the surgical template, the bone was drilled as planned with a 2mm diameter drill. A tissue punch guide was used to enlarge the aperture at the soft tissue level to the 3.5mm diameter required for the implant (NobelActive NP 3.5x15mm). This was done to provide a larger opening for the next procedure – a soft tissue graft (Figures 9–12).




3. Soft tissue graft: Ophthalmic blades can assist while performing the tunnel technique through a 3.5mm access. The key challenge was to pass the graft through the very small opening. In these situations, rolling

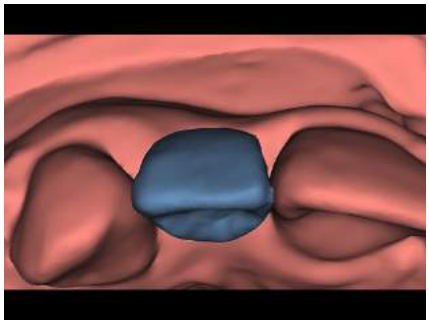
the graft may help (Figures 13–16).



Outcome and conclusion

Immediately after surgery, increased buccal volume was observed as a result of the keratinised soft tissue graft (Figures 17 and 18). After two years, acceptable and balanced buccal volume was maintained (Figure 19). Soft tissue development was positive, and the mesial papilla of tooth 12 was satisfactory. The soft tissue was able to provide high stability for the complex implant crown and was capable of compensating buccal depression caused by bone resorption. The patient's expectations were fulfilled; she felt happy and secure, and exhibited a very nice smile.



Concluding observations:

- when executed by a clinician with the necessary experience, it is a very accurate procedure which can ensure highly precise positioning of the implant; it is also minimally invasive and allows immediate provisionalisation
- a certain amount of time must be devoted to shaping papillae and soft tissue maintenance during the healing period
- using a micro-surgical procedure to insert the soft tissue graft is a very delicate operation – the vascular integrity of the periosteum must be maintained to achieve good results
- as a one-step surgical procedure, it is a comfortable option for the patient

alternative augmentation procedures (such as GBR) usually impose flap surgery with all of its associated disadvantages (such as longer healing times; vascular disruption of the periosteum; and the aggressiveness of the technique)
it still is an experimental technique but has promising results (Figures 20–22)

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