Optimal treatment planning for perfect aesthetic and functional results—case report

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Introduction

When the patient first presented to my clinic, she was 16 years old, came with a major dental trauma caused by a bicycle accident a few years before. As a result of the accident, she lost one of the central incisors and the other one was fractured.

The patient was desperate about her smile, she wanted it back and she had very high aesthetic expectations, I knew then that this case would be a challenge. I thought to myself: ‘Am I capable to give her back her beautiful smile? And more than this, am I capable to give her beautiful smile back for the rest of her life?’ This means maybe for the next 60 to 70 or even more years.

As dental professionals, we want to give to our patients’ long-life and predictable results of the treatment; however it is very hard with young patients who are still growing. Therefore, I decided to postpone the surgery until she was at least 18 years old, and we decided to proceed with a temporary aesthetic restoration and to keep the patient under constant dental control over the next two years.

Finally, we decided to make a permanent prosthetic restoration; taking into consideration the high aesthetic requirements of the patient and her young age, I chose implant treatment.

Treatment planning

After a clinical examination, a cone beam computed tomographic (CBCT) scan was performed (VGi evo, NewTom).

Nowadays, inserting an implant without using a CBCT is like driving to an unknown destination without GPS, but still hoping to arrive at the right place only because you are a good driver. You could succeed by mistake or being lucky, but a risk of a failure is too high.

During a clinical examination, I observed a horizontal and vertical bone defect (Figs. 1a–c) but did not expect any complications.

In many cases, the crest looks fine during the clinical examination, but after raising the flap it appears that the bone is much thinner than expected because
the width was given by the gingiva, not by the bone. This was one of these cases, but fortunately I realised it before the surgery.

The analysis of the CT scan showed that the bone width of the crest was only 2 mm (Figs. 2a & b). It was obvious that the bone regeneration was needed.

Taking into account the high aesthetic expectations of the patient and dimensions of the bone defect, I didn’t want to risk one stage surgery (which I planned initially, before I saw the CT scan). I decided to do a bone augmentation first and insert the implant after a few months of healing. I planned to regenerate the bone horizontal and a little bit vertical, with BioOss and BioGide (Geistlich) mixed with autologous bone harvested from the nasal spine.

**Surgical procedure**

I am not exaggerating when I say I have seen thousands of patients before surgery, many of them were very nervous, and anxious about what was going to happen. Therefore, I was astonished seeing this young patient calm even when I was explaining to her the steps of the surgical procedure. Moreover, she wanted to know everything about guided bone regeneration, xenograft, allograft, palatal bone augmentation, implant insertion and gingival graft.

Truly surprised, I asked her why she wanted to hear all the details—was she afraid? But then she said: ‘How could I be afraid? I’ve been waiting for more than four years! I’m here to take back what I lost a long time ago, so let’s do it!’
During the first surgery (Figs. 3a–d), we observed a large amount of the augmentation material that was used, which is hard to predict how much of it will become real bone.

After 4 months, another CBCT scan was performed to evaluate bone regeneration level (Figs. 4a & b). The regeneration was not perfect but I was satisfied with the result (Fig. 5). I have noticed that the nasopalatine foramen was exactly where the implant placement was planned. This was another very important information provided by CBCT scan. With this new information I was able to better plan the steps of the implant insertion.
I also decided to augment the nasopalatine area to insert the implant in the correct three-dimensional position from the prosthetic point of view. I choose the V3 implant (MIS Implant Technologies), which is very conservative for the bone and has a switching platform to better stabilise the tissues around it.

The second surgery went well; after the procedure we took one more CBCT scan, to check if the implant had enough ‘bone’ around it. The scan showed the large amount of augmentation material around the implant (Figs. 6a & b).

The healing process was completed after six months; however, I was not satisfied with the gingival contour and therefore I decided to perform a free gingival graft (FGG) to increase the gingiva volume.

The FGG was harvested from the palatal area of teeth 26 and 27 (Figs. 7a–c). A tunnel was created in the area to be augmented and the gingival graft was very well stabilised with non-resorbable Coreflon sutures (Fig. 8b). I have used also an individualised healing cap to push the tissue more buccally for the perfect final shape of the gingiva (Fig. 8d).

**Prosthetic procedure**

After gingival maturation an impression was performed and the final crown was made. Complicated cases like this one need a very well planned prosthetic plan and a skilful dental technician. The gingival contour could be (re)modelated by a crown with an appropriate shape.

The shape of the crown can help or destroy the surgery results so it is very important to have correct planning before starting the prosthetic work (Figs. 9a & b). The area under the gingiva must be concave to allow the tissue to grow and have a proper thickness, but there are some areas where we need also a convex part of the crown that can push the gingiva to the ideal contour. Only taking care of all these details can give satisfactory results, when implant restorations can look naturally (Figs. 10a & b).

**Conclusion**

At eight months’ follow-up, the patient was very happy with the final result, and so was I; the implant and surrounding tissue were stable.

Monitoring difficult cases with CBCT is mandatory to avoid unexpected complications, as we know that raising a flap on an augmented area means lost bone and nobody wants that. Moreover, CBCT scans assure better diagnostic, treatment planning and predictable results._

**contact**

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