

# Simultaneous soft and hard tissue augmentation with implant placement

Selvaraj Balaji presents a recent case study.

A female patient in her 60s presented missing a lateral left incisor that she wanted to replace. She visited the practice shortly after the covid pandemic, during which she had developed an infection and the UL2 had been extracted.

A full medical history was taken, showing the patient to be generally fit and well. A CT scan revealed buccal bone loss around the UL2 site and where a large cyst had been removed there was a major bony defect. There was also a soft tissue defect around the site of the UL2. The patient's periodontal health was fair, and a crown was identified on the UR1.

## Treatment planning

The patient was presented with all appropriate treatment options, including no treatment, a removable denture, a bridge and an implant-retained crown.

She was hesitant to proceed with a removable denture due to her preference for a fixed solution. A bridge would also have required the removal of the UR1 crown, with the associated increased costs, which she was keen to avoid as well. An implant, therefore, was the most suitable treatment for this patient. At this point, it needed to be decided whether bone augmentation and delayed implant placement would be



Fig 1. Presentation.

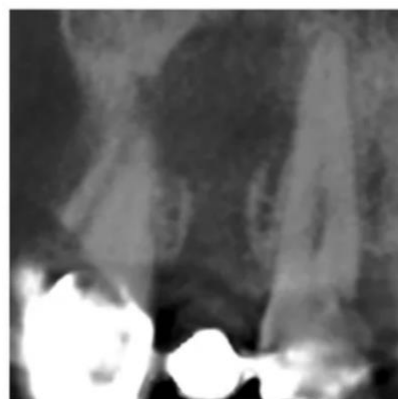


Fig 2. T scan of presentation.

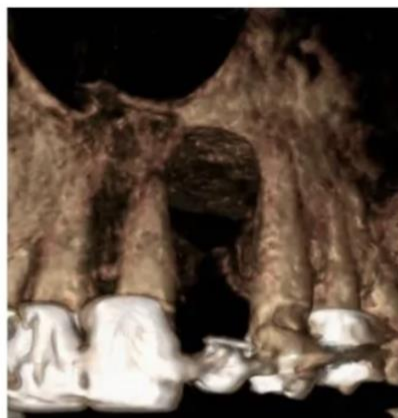


Fig 3. CBCT scan of presentation showing large bony defect.



Fig 4. Full thickness flap raised to reveal bony defect.

most appropriate, or if simultaneous grafting and implant placement could be performed.

A CBCT scan provided greater visualisation of the bony defect, demonstrating adequate bone for primary implant stability. Consequently, simultaneous bone augmentation – using a combination of autogenous bone and xenograft material – was indicated alongside implant placement to treat the

bony defect and increase the hard and soft tissue volume for optimal results. There was also a need for soft tissue augmentation in order to increase the gingival volume to ensure good healing and a highly aesthetic outcome. A connective tissue graft was selected for this case, using autogenous soft tissue from a connective tissue graft (CTG) harvested from the patient's palate.

Treatment was planned to ➔

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Fig 5. Preparing socket for implant placement.



Fig 7. Bone augmentation mixture of autogenous bone and xenograft placed.



Fig 6a. Harvested bone.



Fig 6b. Harvested bone.



Fig 8. Implant placed.



Fig 9. Bone augmentation material packed around implant.

☛ determine the most suitable implant position, angle and depth, with consideration for the restorative space created. Harvesting sites were also identified and communicated to the patient. All aspects of the procedures involved were discussed with the patient in detail, exploring the benefits, limitations and risks. Once all the patient's questions were answered and she was comfortable with treatment, she provided informed consent to proceed.

#### Surgical appointment

The UL2 area was numbed using LA and a full thickness flap was raised to reveal the buccal bony defect.

Autogenous bone was harvested from the left external oblique using a safe scraper. The UL2 bony defect cavity was then filled with a mixture of the autogenous bone and a xenograft material. What I refer to as a layering technique was used to achieve this, which is designed to ensure the autogenous bone graft attaches around 360° of the implant for osteointegration to provide maximum strength and stability.

An Astra Tech EV 3.6mm diameter implant was placed to the pre-determined position, angle and depth. Sufficient primary stability was achieved from the interdental bone and at the apex of the implant. Bone augmentation was completed as planned, adding a mixture of autogenous bone and xenograft around the implant, which was then secured using a native collagen membrane with

master pins.

During the same appointment, connective tissue was harvested from the palate. This was placed over the implant site to increase the soft tissue thickness post-surgery. The flap was then closed tension-free with 6.0 monofilament, resorbable glycolic sutures.

A temporary restoration was placed out of occlusion. The patient was given all the standard post-operative oral hygiene instructions and advised to avoid chewing on the implant site for a few days.

#### Review and restoration

The patient returned to the practice one week later for the initial surgical review. She reported only very minor discomfort – as would be expected – which was managed with over-the-counter painkillers. A radiograph was taken to confirm the implant position and the



Fig 10. Membrane placed over graft.



Fig 11. Preparing for tension-free flap closure with soft tissue graft.



Fig 12a. Flap closed.



Fig 12b. Flap closed.



Fig 13. Healed implant site three months after surgery.



Fig 14. Exposed implant.

Beginning of the osseointegration process. Three months post-surgery, the implant was exposed and a temporary restoration fitted. Approximately six months after this, the patient confirmed she was happy with the aesthetics and function of the temporary restoration, and the final restoration was fitted.

Upon a review of the patient five years after the treatment was completed, the implant remained fully integrated, bone levels were stable and the soft tissue was thick, pink and healthy.

**Discussion**

Both the patient and clinician were pleased with the outcome delivered in this situation. The case clearly demonstrated what can be achieved even when a significant bony defect is detected. For the treating clinician, it is crucial to have the skills and the confidence to provide effective soft tissue management



Fig 15. Temporary restoration.



Fig 16. Final restoration.

when approaching similar clinical scenarios, including everything from tension-free flap closure to the harvesting of a connective tissue graft for enhanced soft tissue aesthetics and healing. The flap design and soft tissue manipulation techniques must be incorporated into the treatment plan so both the practitioner and patient know exactly what to expect during and after surgery.



Fig 15. Five year post-op radiograph.