

Implants in the aesthetic zone

Jonathon Schofield presents a recent case study.

The patient was a 42 year old female. She had recently fallen over and sustained a blow to her upper left central incisor (UL1). The upper left central incisor tooth was an abutment for a four-unit bridge. The other abutment tooth was her upper left first premolar (UL4). The bridge had two pontics at the upper left lateral incisor site (UL2) and the upper left canine site (UL3) (fig 1).

Patient complaints

- The patient was in pain from her UL1.
- She did not like the appearance of her upper right lateral incisor (UR2).

Notable factors about the patient assessment

- The patient had an uneven, high smile line.
- The clinical crowns of her bridge (UL1-UL4) appeared longer than the clinical crowns on the other side (fig 2).
- UL1 had a fractured root and was not savable (fig 3).
- The patient had very high aesthetic requirements.

Diagnosis

- Vertical root fracture of UL1 following trauma.
- Acquired tooth loss.
- Porcelain fused to metal crown on tooth UR2 has a visible crown margin and the clinical crown appears too long. The tooth UR2 was presumed vital as it responded to a digital electric pulp tester and responded to cold spray testing.

Treatment plan

Extract UL1 and provide an immediate upper partial acrylic

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denture.

Allow the extraction site to heal for six weeks and assess the need for



Fig 1: A four unit bridge in situ with abutments UL1 and UL4 and pontics UL2 and UL3



Fig 2: The uneven and high smile-line and the longer appearance of the clinical crowns on the patient's left side.



Fig 3: The tooth UL1 after extraction. There is a large granuloma along the fracture line.



Fig 4: UL1 six weeks after healing and the provisional denture in situ.

hard and soft tissue grafting to allow the placement of dental implants and enhance the final soft-tissue aesthetics.

Place two bone-level implants at sites UL1 and UL3 to allow the provision of a three-unit bridge with a pontic at site UL2.

Restore the implants with a provisional three-unit provisional bridge and restore teeth UL4 and UR2 with provisional crowns.

Restore the implants at sites UL1 and UL3 with a screw-retained



Fig 5: The autogenous block grafts along with additional particulate graft protected by a collagen membrane.



Fig 6: The position of the denture before grafting and 10 days after the grafting.



Fig 7: The implants at sites 21 and 23 being placed with the aid of a surgical jig.

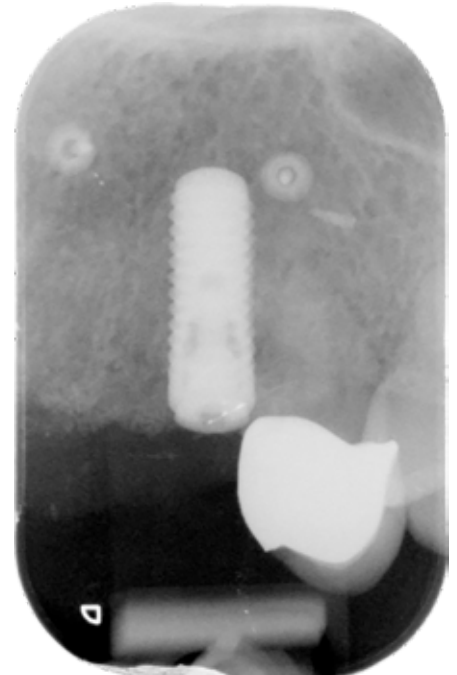
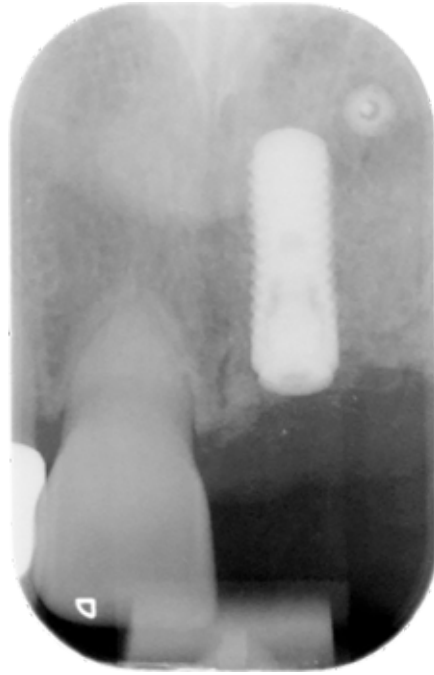


Fig 9: The radiographs of the implants at sites UL1 and UL3. The titanium membrane tacks are also visible.



Fig 8: The sub-epithelial connective tissue graft and the wound closure with 5.0 prolene sutures.

and to communicate to her the limitations of her treatment.

Re-assessment phase

Six weeks after the extraction of UL1 it was assessed that there was insufficient bone height and width at the UL1 site and the UL3 site.

There was also a deficient soft tissue volume at the proposed pontic site UL2.

Regaining hard tissue volume

The soft tissue aesthetics around an implant and at a pontic site are easier to optimise if there is sufficient bone height and width. In this case, a cortico-cancellous block was harvested from the mental protuberance, divided and two screw-retained blocks were used to enhance the bone volume at UL1 and UL3 sites (fig 5).

The buccal aspect of the edentulous site was multi-perforated and the buccal ridge and the blocks were overlaid with a mixture of autogenous bone chips and bovine xenograft (Geistlich Bio-Oss). The graft site was protected with a resorbable collagen membrane (Geistlich Bio-Gide). The collagen membrane was stabilised with titanium membrane tacks.

The sutures were removed after



Fig 10: The use of provisional restorations to shape the soft tissues around the implants and in the pontic area.

definitive bridge and definitive crowns on teeth UL4 and UR2.

Stabilisation phase

The bridge was sectioned between the distal of the pontic at UL3 and the mesial of the abutment at UL4. The UL1 was extracted and the socket curetted (fig 3).

The patient was provided with a provisional denture and the area was allowed to heal for eight weeks (fig 4).

The provisional denture was used as a basis to assess the patient's aesthetic requirements

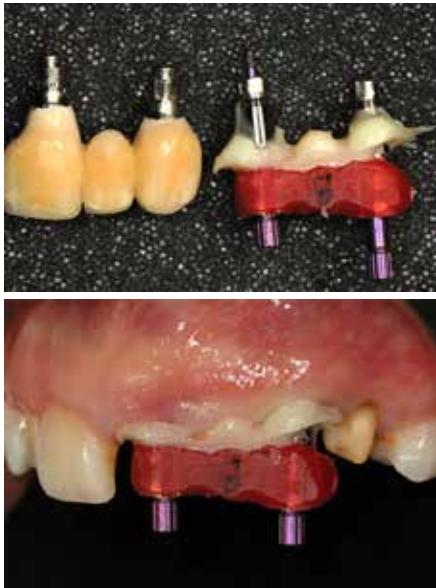


Fig 11: The transfer of the desired soft tissue profile from the provisional restorations to the definitive impression by using customised, linked impression copings.

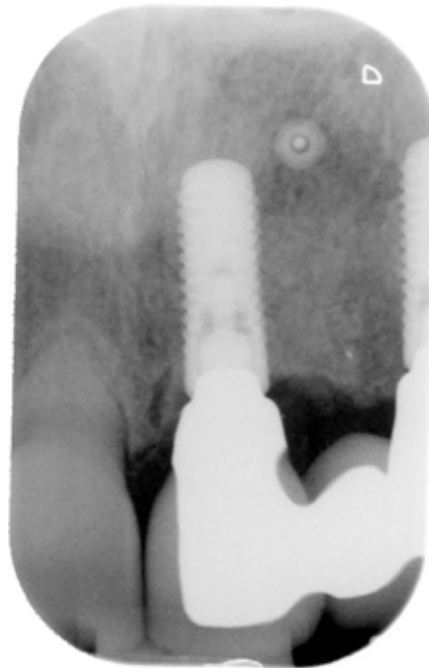
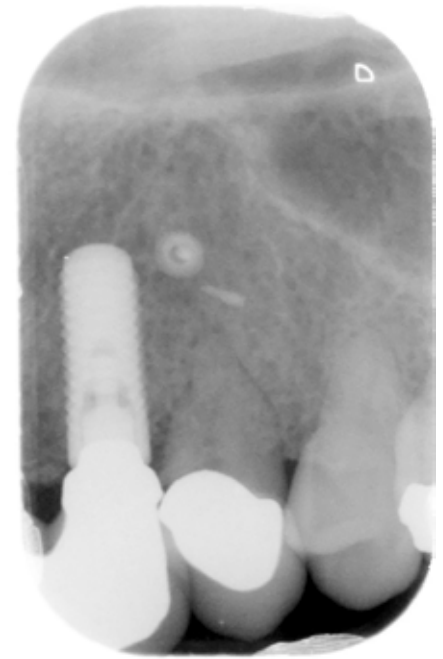


Fig 12: The definitive restorations in situ at sites UL1 and UL3.



10 days and the acrylic provisional denture was adjusted to accommodate the increased bulk of the hard tissues that had been achieved (fig 6).

The block graft was left to consolidate for six months. During this period the patient was provided with a provisional acrylic denture.

Placing the implants and enhancing the soft tissue volume

Two Straumann 4.1mm diameter titanium bone-level implants were placed at sites UL1 and UL3. The implants were placed using a hard acrylic surgical jig which was tooth borne for stability (fig 7).

The soft tissue volume at the pontic site was enhanced with the aid of a sub-epithelial connective tissue graft placed at site UL2. The connective tissue graft was secured using resorbable sutures and the flap was released and secured with 5.0 prolene sutures (fig 8).

Radiographs were taken post surgery to confirm the implants were in the correct place (fig 9).

The implants were left to osseointegrate for a period of eight weeks.

The implants were then micro-exposed to preserve the maximum amount of keratinised mucosa.

The provisional phase

Provisional screw retained

restorations were provided. The provisional restorations had a metal sub-structure and composite provided the tooth coloured component.

Composite was added chair-side to the provisional to sculpt the soft tissues using the dynamic compression technique (fig 10).

The provisional restorations were left in-situ for four months. Once the desired aesthetics had been achieved, customised impression copings were constructed to record the desired soft tissue profile in the definitive elastomer impressions (fig 11).

Fitting the definitive restorations

The definitive implant restoration was a screw-retained porcelain fused to metal bridge (fig 13).

The patient was given detailed maintenance instructions.

Periapical radiographs were taken of the restored implants to record the initial peri-implant mesial and distal bone levels and to check correct seating of the definitive implant borne restoration (fig 12).

Discussion

This case represented an SAC complex case. It illustrates the importance of staging the treatment and allowing one stage of the surgical intervention to heal before commencing the next stage. This

allows the clinician more time with the patient to level the patient's expectations and to predict the



Fig 13: The definitive screw-retained PFM bridge on implants at sites UL1 and UL3. Definitive PFM crowns have been provided on teeth UR2 and UL4.



Fig 14: A close-up of the implants at sites UL1 and UL3 and the pontic at site UL2.



Fig 15: A close-up of the definitive restorations and how they fit in with the overall appearance of the patient's smile.



Fig 16: A comparison of the patient's smile before and at the end of treatment.

final outcome more precisely.

Clinical photography forms an important part of patient consent and a medico-legal record; the photographs also serve as a reminder to the patient of where they started.

It is my experience that a more predictable gain in alveolar bone width occurs with a secured autogenous bone block, which is overlaid with xenograph particles and protected with a membrane. An over-correction of the hard tissue volume is often needed to achieve a convex buccal architecture of the soft tissues

around implants, which will mimic that around the teeth.

A sub-epithelial connective tissue graft secured at a pontic site can enhance the appearance of the soft tissues around a pontic.

The use of provisional restorations is often essential to contour the soft tissues.

Careful home maintenance and regular professional reviews are essential to ensure that these cases are stable over the long term.

References available on request.

Expert speaker line-up announced



Professor Sreenivas Koka, renowned for his leading expertise in the field of implantology and prosthetics, has been announced as one of the speakers at this year's Nobel Biocare Team Conference.

The event, which takes place November 6-7 at The Brewery, London, offers delegates a combination of lectures, hands-on workshops

and masterclasses, each supported by a solid foundation of science and research. They will be able to develop knowledge and practical skills in a highly effective, intimate and interactive environment, discovering the very latest innovations from top speakers such as Professor Koka.

Professor Koka earned his DDS and MS (prosthodontics) degrees from the University of Michigan, his PhD in Medical Sciences from the University of Nebraska, his post-doctoral research fellowship from the University of Michigan and his MBA from the Massachusetts Institute of Technology. With more than 80 published articles in peer-reviewed literature, as well as extensive involvement in lecturing and mentoring internationally, Professor Koka is ideally placed to demonstrate techniques and ideas from the very forefront of the field. During the Nobel Biocare Team Conference he will be presenting a masterclass alongside Professor Daniel van Steenberghe, entitled 'Peri-implantitis: a tsunami waiting to happen? Facts and fallacy'.

"Reports of peri-implantitis are steadily increasing and it is up to the profession to ask what we can do to reduce its prevalence," says Professor Koka. "During our session, Professor Steenberghe will focus on the treatment and management of the condition, while I will look at how the disease is caused and what we can do to prevent it. We

know that patient behaviours influence the development of peri-implantitis to some degree, but it is how we as clinicians use dental implants that will have the most significant affect. The key is in the treatment planning, before implant surgery is performed. We need to fully understand the science behind our decisions: where do we choose to place the implants, in what types of people and why?"

"We used to have many concerns with regards to implantology, but as the procedure has become more common and success rates have improved, we have relaxed our approach slightly. This just needs tightening up again to ensure we create the best possible chances of clinical success. My section of the masterclass will focus on what we should be looking for and doing in preparation for implant placement. Particularly relevant for those who are relatively new to the field, the session will emphasise that implants will not always work well with every patient."

Professor Koka will also present the lecture 'Prosthetic solutions for the edentulous patient: What, when and why?' During this session, delegates can expect to explore the key prosthetic pathways for different solutions and really get to grips with the importance of effective case selection. Discussing the evolution of protocols and materials in this area, there will also be an opportunity for debate regarding prosthetics for the All-on-4 treatment concept, prosthetic implant bridges, IBO and maintenance.

In total, more than 20 internationally leading speakers will contribute to the outstanding programme, including Professor Ian Brook, Edmond Bedrossian, Jose Navarro, Stefan Holst, Alessandro Pozzi, Carl Manhem, Peter Wohrle, Pascal Kunz and Steve Bongard, to name but a few. A myriad of intriguing topics will be covered from immediate placement to integrated workflows, tissue augmentation and the patient journey.

For more information about the conference call 0208 756 3300 or visit www.nobelbiocare.com/uk2015