Case study:
Implant retained crowns

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_Treatment summary:
Patient complaint and expectations

The patient, who had a clear medical history, presented with a dull ache that appeared to be associated with a bridge in the upper left quadrant which felt “loose and spongy”. Because of the existing problems with the bridge, the patient was reluctant to have a new bridge placed but wanted a long term solution. She was adamant that dentures were not an acceptable option due to her strong gag reflex. Her oral hygiene was excellent.

_Clinical examination

No abnormalities were detected during extra-oral examination but the intra-oral clinical examination revealed:

UL4-6 VMK bridge present with the UL5 missing. UL4 had an 8mm pocket distally. UR4 also has 8mm pocket mesially. All the other teeth were healthy and her oral hygiene excellent. She was seeing the hygienist on a regular basis and her BPE score were 400/000. There was pocketing of 8mms UL4 MP, Midpoint and DB. There was also pocketing 8mms UR4 MP, Midpoint and DB.

Radiographic and photographic examination:

This confirmed that there was vertical bone loss mesially UR4 and distally UL5 of around 10mms. There seemed to be adequate bone height of 14mm from the sinus wall to mesial aspect of UL4, and the UL5 space had a height of 10mms from the alveolar crest to sinus wall, and UL4 14mms, (calculated from radiographic calibration using space of UL5 to calibrate). The ridge width was assessed by clinical palpation and ridge mapping which seemed adequate.

Assessment of case

There was a distal bone defect around the UL4. The implant could be positioned to the mesial aspect and not follow the path of the extracted socket. This would give an increased bone height availability. The options of implant length could be a 13mm or a 16mm (and internally raise the sinus by 2mms) (Nobel Biocare). With the UL5 an 8mm implant or a 10mm im-
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plant length can be considered. I felt that the lining could be successfully lifted internally, therefore placement of 16mm implant with a internal lifting length of 2mm for the UL4 and 10mm implant for the UL5. This would provide a greater surface area for integration. This would have also allowed a greater than 4.5mm space between the two implants and 1.5mms between implant and tooth structure. A prosthetic stent manufactured by the laboratory would guide the final position of the implant head for the UL4, and the implant can be thus angulated mesially.

The UR4 also had a mesial defect, and long term this will require attention but due to financial constraints, the patient did not wish to have any treatment to this tooth at this time. I advised her that if her periodontal health deteriorates, further bone will be lost, and the placement of an implant may require augmentation procedures however, following this discussion, the patient was content to continue to monitor this tooth for the time being.

Proposed treatment

I outlined and discussed with the patient various treatment options that included:

- no treatment
- dentures (both cobalt chrome and acrylic)
- conventional bridges
- implant retained crowns

Following this discussion and taking into account the patient’s verbal and written decision to have no treatment of the UR4, the following treatment plan was proposed:

1) Removal of upper left bridge and maintaining the UL6 as a crown. It was important that the patient had already been made aware that a new crown would be required if the UL6 crown was not intact after the bridge had been divided.

2) Replacement of the UL4 with a dental implant, which would be angled mesially to 16 mm length, 3.5mm width, internally lifting the sinus membrane by 2mm. If there was an acute infection at time of surgery, the treatment would be abandoned and healing time of six weeks to three months allowed. If there seemed less bone available than anticipated, or the socket was not intact at the crestal level and 5mms from the crest (as the implant was not being placed in the socket) then the wound would be closed off and reassessed at a later date. Replacement of the UL5 (as long as there was no acute infection present with UL4) with a 10mm long, 3.5mm wide implant supported crown. Should the implants be in position and adequate soft tissue was not present then a palatal flap would be considered.

3) Temporisation with a small denture avoiding the soft tissues. This would prevent movement...
of adjacent teeth and over-eruption of the opposing teeth.

4) I have discussed with the patient potential complications and the requirement of additional augmentation procedures such as bone grafting and conventional sinus grafting along with the relative risks, complexities and benefits of these procedures. We had also discussed the benefits and risks of guided tissue regeneration for minor defects.

_Treatment sequence

Short term: The patient was advised of the importance of continuing hygiene treatment to stabilise the bleeding and reduce the pocketing around the UL4 and UR4 areas. A temporary denture replacing the UL45 would be constructed.

Medium term: The placement of implants UL45 as discussed above, and of course, maintenance of hygiene.

Long term: The patient was advised that alongside her home hygiene regime, it would be advisable to see the dental hygienist for treatment at least on a six-monthly basis. Post treatment reviews during the course of which I would be checking for peri-implantitis/infections, loss of integrations, loss of bone and gingival heights, and dental hygiene were recommended at intervals of three, then six months and thereafter, annually.

It was important to underline the need to monitor the bone loss around the UR4 area and the patient was advised that should further bone be lost, we would have to consider advising its extraction and prosthesis and should the crown further fracture UL6, its possible replacement with a new crown.

_Treatment appraisal

The treatment was executed exactly as planned. The sinus was tenting in the UL4 area without perforation, no acute infection was present, the sockets were intact, and two implants were successfully positioned in the desired position. There was an initial doubt at the assessment at 10mms length when utilising the osteotomes for the UR4 implant, which was confirmed with a periapical during the surgery, when I reached an area of less dense
bone rather than sinus involvement. The UL5 implant was positioned close to the sinus membrane, but no internal lifting of the membrane was carried out, and as our planning had highlighted this close positioning, I checked for and found that it was clear of perforations. The final treatment was surgically safe and sound and the patient’s periodontal health has remained stable. The patient was happy with the outcome and the natural aesthetic appearance of the prosthesis therefore the patient’s expectations have been met satisfactorily.

The treatment that was executed holds a great prognosis, as was explained in detail to the patient, who was shown how to effectively keep her mouth and the prosthesis clean. As outlined above, the risk of component fracture and teeth maintenance had been already discussed with the patient.

The pocketing has substantially reduced on the UR4 to midpoint 2mms, mesiobuccally 3mms and mesiopalatally 4mms.

Dr Shushil Dattani  BDS, MFGDP(UK), Dip-ImpDent RCS (Eng) Shushil qualified from the Royal London in 2000, followed by a two year programme and membership of the Faculty of General Dental Practice at the prestigious Royal College of Surgeons. He then continued his education for a further two years to be accredited with a Diploma in Implant Dentistry at the Royal College of Surgeons which is recognised as the gold standard qualification for implant dentistry. Shushil is a member of the Association of Dental Implantologists, the American Academy of Cosmetic Dentists and regularly speaks and trains at courses around the world including the pioneering American and British Cosmetic Dentists.