

Immediate loading: nine year follow up

Edouard Béal explains through a case study how a titanium implant with a zirconia collar can be used to help improve the outcome of treatment.

A 31-year-old female patient was referred to the practice, after she had experienced trauma to the UL2. The referring practitioner had performed endodontic treatment using gutta-percha filling material in an attempt to save the tooth. However, this procedure proved to be unsuccessful following the discovery of a fracture on the palatal aspect of the tooth. Further treatment options were discussed with the patient, which involved extraction of the UL2 due to the hopeless prognosis. As the patient rejected a temporary removable solution, she was referred for dental implant treatment.

Treatment planning

Subsequent to extraction of the UL2, radiographs were taken to assess whether the width of the buccal bone plate was sufficient enough to be able to achieve primary stability. The radiographs also demonstrated that there was adequate apical bone height to support an immediate loading protocol. Otherwise, guided bone regeneration (GBR) would have been required. A TBR Z1 implant with a 1.5mm zirconia collar was selected.



Fig 1: UL2 pre-extraction.



Fig 2: Radiograph of UL2 post-endodontic treatment.

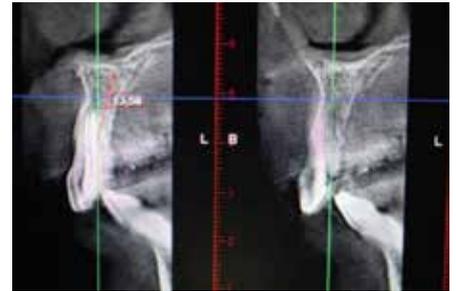


Fig 3: Radiograph pre-treatment.



Fig 4: UL2 extracted and implant placement hole drilled.



Fig 5: UL2 post-extraction.



Fig 6: TBR implant placed.

Implant placement

Instruments were used to make a small incision in the gingiva and raise a flap. Upon inspection, the integrity of the buccal bone was verified. If the patient had presented to the practice today, flapless surgery would have been performed. However, with the 1mm width of the buccal bone plate needed to support the surgical technique used, this was the common protocol at the time of treatment.

The surgical site was cleaned and a hole was drilled before the implant

was placed at bone level. As can be seen in fig 7, it was placed slightly above the bone. The benefit of using an implant with a zirconia collar is that it can encourage effective bone and gingival adhesion, so clinicians are able to modulate the position of the implant according to the primary stability required. Again in hindsight, a Z1 implant with a 2.5mm zirconia collar height would have been used, if it were available at the time. This would have created a larger surface adhesion between the zirconia collar and the



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Fig 7: Radiograph of implant post-placement.



Fig 8: Temporary abutment placed.



Fig 9: Temporary crown fitted.



Fig 10: Nylon stitches used.



Fig 11: Tissue healing 8 days post-implant placement.



Fig 12: Radiograph of implant 8 days post-placement.



Fig 13: Temporary crown and abutment removed 4 months post-placement.



Fig 14: Titanium abutment fitted.



Fig 15: Permanent crown placed.



Fig 16: Radiograph following placement of abutment and crown.



Fig 17: Healed tissue 18 months post-implant placement.



Fig 18: Preservation of the soft tissue.



Fig 19: Comparison of implant adjacent to natural teeth.

absorbing any impacts and protecting the implant during osseointegration, a PEEK temporary abutment was placed and an ION composite resin crown fitted using 3M Protemp cement. In this case, a PEEK temporary abutment was chosen, as it promotes better osseointegration and is not as stiff as metal. Nylon stitches were used to hold everything in place.

Healing

Eight days post-surgery, the stitches were removed and the implant was reviewed. Fig 11 shows that the gingiva around the implant was healthy and healing well. A radiograph was taken to confirm that the implant had begun osseointegrating. After four months, the temporary crown and abutment were removed and the papilla and soft tissue had been preserved (fig 13).

Permanent implant restoration

At the time, it was decided that a

permanent titanium abutment would be fitted with a zirconia crown. As a result of progressing technology, however, I would now use a customised zirconia abutment fixed to a titanium base instead, as this ensures the same strength of the interface between the implant and the abutment, while offering enhanced aesthetics.

Once the final restoration was fitted, a radiograph was taken to show a perfect junction between the zirconia collar and the crown. The trumpet-shaped design of the zirconia collar enables the implant to maintain the convexity of the gingival profile, which is identical to a

Gingiva, which makes the implant more impervious to bacterial infiltration at the crestal bone level and also provides enhanced aesthetics.

As the zirconia collar platform is wider than the diameter of the implant, bone grafting can be avoided in the case of a post-extractive implant placement procedure. This is because the zirconia collar closes the gap between the implant and the socket.

Another radiograph was taken to confirm that the implant had achieved primary anchorage. For the purposes of



Fig 20: A patient with congenitally missing UR2.



Fig 22: Healed tissue.

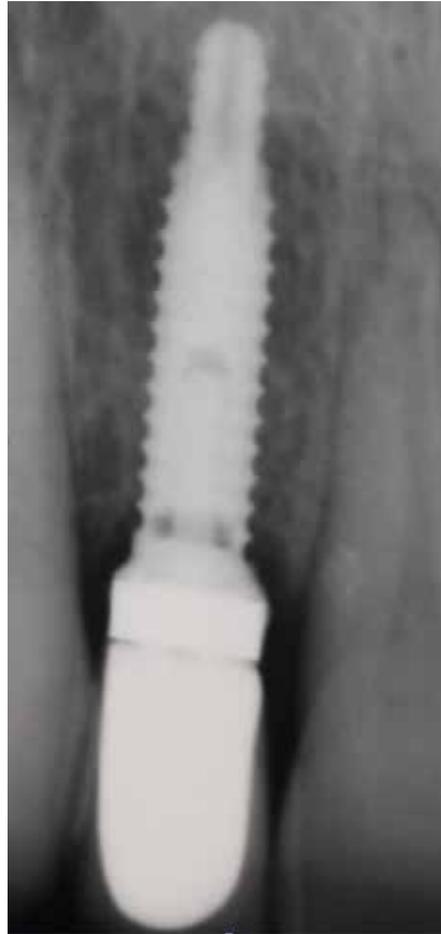


Fig 21: Radiograph 6 months post-placement of TBR implant.

☞ natural tooth. This means clinicians can avoid the concavity often found with bone level implants or delayed implant placement for this reason.

Fig 15 was taken on the day the final restoration was placed. It shows slight soft tissue inflammation caused by the gingiva reacting to the resin of the temporary crown, but otherwise the implant had healed well.

Review

A year and a half after implant placement, the gingiva around the implant was pink, and the integrity and volume of the papilla had also been maintained so that the implant was identical to the natural teeth. Fig 17 also shows that there was no grey transparency, which might have been seen with a titanium bone level implant.

After nine years, the gingiva is healthier where the implant is, in comparison to the natural teeth. The result is highly aesthetic – there is continued preservation of the papilla, hygiene is improved as a result of the zirconia collar, and there is also no inflammation.

Discussion

The TBR Z1 implant can be used for a variety of different indications, such as when young patients have a thin biotype or patients are concerned about gingival recession and aesthetics are a priority to them. I use the Z1 in anterior or posterior positions, as well as simple or complex cases such as when a sinus lift or GBR is required. I have had a case where a

50-year-old patient presented to the practice with congenitally missing UR2, which was extracted and immediately replaced with an implant. Fig 22 shows the patient's oral cavity six months after the final restoration was fitted, with the orange peel texture of the gingiva appearing healthier around the implant than around the adjacent natural teeth.

Clinicians are aware that titanium offers excellent osseointegrative properties. Yet within a few weeks of placing a titanium implant with a zirconia collar, there is effective soft tissue adhesion as well. This will protect the crestal bone and can prevent or help treat peri-implantitis. Thanks to the attachment created between the zirconia and the gingiva, the risk of bacterial penetration – which is one of the causes of peri-implantitis – is drastically reduced. Moreover, should peri-implantitis arise, the successful outcome of the additional surgical procedure will be facilitated by optimal primary healing, and by the quick regeneration of attached gingiva around the zirconia collar.

In cases where the patient's gingiva recedes from the natural teeth surrounding the implant, the zirconia collar can become visible, but aesthetics are still better than they would be if the shoulder of a titanium abutment could be seen. The zirconia collar acts as a "scaffold", encouraging the proliferation of osteoblast and fibroblast cells, which then stimulates a creeping attachment of the gingiva. As a result, Z1 implants can offer greater aesthetics than conventional titanium implant systems without a zirconia collar, ensuring clinicians are able to provide optimal, long-lasting results for patients seeking implant treatment.