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.

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

Edouard Béal
is a dental implantologist who operates from a private dental practice in Versailles and is an implantology attaché at the Versailles University hospital.
Implants

 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 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
Implants

Fig 20: A patient with congenitally missing UR2.

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

Fig 22: Healed tissue.

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

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.