incision made. A pouch is made in the buccal tissue and the connective tissue is reflected back on itself. A narrow healing abutment is then placed to hold the graft in place and suturing is rarely required.

**Zinc or titanium?**

Usually two weeks is left between exposing the fixture head and taking impressions. The decision needs to be made as to whether to use a zirconium or titanium abutment. Titanium has been around for a long time and is known to work. However, zirconium appears to give a better soft tissue response as anecdotally it has been noted that tissue appears to be attracted towards it. Gold abutments should be avoided as the catalytic action between the titanium implant and the gold abutment can result in bone loss. Gold abutments appear to be 'tissue tolerant' rather than showing 'tissue integration'.

Either way, the abutment can be torqued down onto the fixture head and a laboratory provisional made if further tissue maturation is required. This provisional crown can be totally fabricated in the lab or the lab can make a temporary coping that allows chair-side fabrication from the wax-up. If the soft tissue has healed, the final crown can be manufactured. If allowing for tissue maturation, this can take anything from three to six months, depending on the degree of maturation required. It is important not to compress the tissues too much as this can cause shrinkage and recession of the soft tissue. In fact the temporary crown is deliberately left un-contoured as this quite literally allows the gingiva to 'grow' down onto the temporary crown, and so appearing to re-grow. A cement vent is also easily incorporated (see below).

**Choosing crown material**

The final impressions can be taken as for conventional crown and bridge. Again choices need to be made between what materials to use for the crown, be it porcelain bonded to metal crown or an all porcelain crown. Our preferred method is to have the laboratory make the permanent coping on the final abutment made previously. For pick up in the master impression when the time is right for this (depending on tissue maturation).

The final crown can be cemented with permanent cement or provisional cement depending on your preferred choice, but ensure that no excess is left around the margins which will induce an inflammatory reaction and cause gingival irritation and recession. For this reason many authors now advocate a cement vent within the palatal surface of the crown to allow excess cement to vent away and not be forced

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**Novabone Dental Putty**

Novabone Dental Putty is a calcium phosphatisilicate, synthetic bone graft indicated for periodontal and maxillofacial defects. It is designed to deliver unprecedented ease of handling without compromising on the quality of the outcome. It is not just a bone void filler, it is composed of minerals found naturally in the body that allow for rapid bone regeneration.

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“Novabone Dental Putty is an excellent material to use during surgical procedures such as socket preservation. I used the material when placing an implant and when complete the material formed well around the implant threads. I am an active user of bioactive glass for bone regeneration and find it builds quality bone for implant placement in the clinically appropriate amount of time.”

Michele J Dimaira, board-certified periodontist, Montville, NJ, DMD, MS, PA.

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Novabone Dental Putty is distributed in the UK solely through Oraldent Ltd, Harvard Industrial Estate, Kimbolton, Cambridgeshire PE28 0NU

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into the sulcus. Some authors prefer a single screw retained abutment and crown in one piece but this can be harder to use in the aesthetic anterior zone.

Case study 1

This case demonstrates an immediate placement and immediate loading scenario. See Figures 1 to 11. The final restorations involved a single implant retained crown and three porcelain laminate veneers to allow even size distribution or symmetrical and correctly sized centrals would not have been possible without a midline diastema.

Case study 2

This case illustrates a delayed placement and delayed loading protocols. A single implant supported crown and a separate crown were placed as both units required restoring, one as it was a space and the other to allow and aesthetic improvement in the previous crown. See Figures 12 to 22.

Conclusion

Implant dentistry and our understanding of what can be predictably achieved have moved forward enormously over the last few years and technology is helping us achieve some wonderful results. However, it must be remembered that there are no short cuts if the ideal result is to be achieved.

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Dr Guy McLellan is dental implant surgeon at Senova Studios. He is doubly qualified in dentistry and medicine and a Fellow of the Royal College of Surgeons of England. He has over 10 years hospital experience including training in ENT and plastic surgery and currently holds a teaching position at Charing Cross Hospital where he runs the dental implant clinic. His experience in implants dates back to 1994 and includes extra-oral implants to retain facial prostheses/reconstruction following facial cancer surgery as well as intra-oral cancer rehabilitation and facial deformities such as cleft lip and palate. He continues to work as a member of the Cranio Facial team at Chelsea and Westminster Hospital. In private practice he limits his practice to surgical implantoLOGY and augmentation procedures including complex intra-oral and extra-oral grafting. He is a mentor for Nobel Biomaterials and is actively involved in Implant education. He is a member of the Association of Dental Implantologists, the European Association of Osteoneintegration and a Fellow of the International Congress of Oral Implantologists.

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Enhanced effectiveness of aesthetic anterior restorations by immediate implant placement

By Frank C. Lazar & Alexandra Steup, Germany

Anterior tooth restoration remains a sophisticated aim in prosthodontics and oral implantology. Scientifically it is highly evident that early loss of alveolar bone results in a progressive loss of the surrounding soft tissues. Whilst conventional implant treatment dictates an overall treatment time of sometimes one to one and a half years, immediate implant placement will determine a reduced interval of as little as about three months. Criteria for immediate implant placement reduce their indications, but evidence there are additional benefits like diminished alveolar resorption, patient morbidity and reduced expenses.

However, vestibular bone defects of the extraction sockets, as a result of the surgical extraction process itself and/or periodontitis, will exclude patients from the therapy of immediate implants.

Well grounded rules for an immediate protocol and transmucosal healing dictate careful extractions and no flap elevations as well as precise plaque control and, if necessary, careful tissue management.

A non-congruent socket-to-implant relationship, however, will require further barrier techniques like membranes or direct augmentation of harvested bone particles.

Concerning the crown design, occlusal contacts as well as lateral contact during chewing must be strictly avoided (immediate implant placement without immediate loading). After three months the definitive prosthetic work with correct occlusion and aesthetics can be incorporated.

Even by choosing a therapy of delayed immediate implant placement (six weeks following extraction) hard and soft tissue loss is not avoidable. Hartmann and Steup structured the various options for a successful implant treatment in the anterior region in the following way:

1. Single-stage immediate implants with:
   a. customised tissue contouring abutments
   b. definitive crowns.
2. Delayed immediate implants placed six to eight weeks post extraction with:
   a. immediate impression taking and insertion of the definitive crown after implant exposure
   b. soft tissue contouring with provisional crowns/abutments followed by definitive crown insertion.

The following case report, based on the first option (single-stage immediate implants with customised tissue contouring abutments), represents a procedure which has been used widely and whenever possible in our unit. The customisation of the surround-