Predicatable treatment concept

Immediate implant placement and provisionalization is a predictable treatment concept (De Rouck et al. 2008). The success rate is at least comparable to data published for single-tooth implant placement using standard protocols in healed sites.

This happens providing careful appropriate patient selection is used and the surgeon is familiar with the techniques that differ from the standard two-stage protocol for implant placement.

For the patient, the main advantage for immediate replacement and provisionalization is fewer surgical visits as well as providing immediate esthetics that are virtually indistinguishable to the original tooth. Sometimes, if the tooth being replaced is discolored due to non-vitality, the esthetics will provide an immediate improvement.

For the clinician, immediate replacement allows for minimal disruption of the soft tissue providing immediate peri-implant support through careful manufacture and design of the provisional restoration. This helps to maintain the stability of the gingival marginal tissues, which is necessary for a successful esthetic outcome.

Root-filling failure

The following is a case study of a 50-year-old female with a history of a failing root-filled, upper-left central incisor. The root filling had been present for approximately 25 years and this had been apexected approximately 15 months before the tooth became problematic (Fig. 1).

The patient did not want another apicectomy and requested that the tooth should be extracted. The various options for restorations were discussed and as the neighboring central incisor was root filled and restored with a post crown, the lateral incisor was restored with a veneer due to microdontia, a bridge was not a viable option. The patient was adamant that she did not want a partial denture.

As the tooth was not infected and investigation had shown that the buccal plate was still intact, it was decided that the tooth could be extracted and immediately replaced with an implant fixture. This was to be utilized to support a Nobel Biocare immediate temporary abutment and a provisional crown.

What the treatment involved

Under local anaesthesia, a crevicular incision was used and no flap reflection. The upper left central incisor was extracted using a very careful (atraumatic) technique with a periotome to preserve the buccal plate of bone and careful manipulation of the gingival tissues.

Once the tooth was removed, the socket walls were curetted to remove any remnants of periodontal fibres or granulation tissue. The socket was inspected to ensure that the buccal plate was still intact (Fig. 3).

Using the standard protocol, the bone was first prepared by penetrating the palatal wall at the apical third. Great care needs to be taken in the osteotomy preparation as the palatal wall of the extraction socket is commonly very dense and difficult to prepare, which can cause “run-off” of the drill tip.

To achieve the initial perforation, the drill is held at an angle of approximately 45 degrees to the palatal wall.
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Larry Rosenthal, DDS
Director, Aesthetic Advantage
New York, NY

Arun K. Garg, DMD
International Lecturer
Aventura, FL

James Jesse, DDS
International Lecturer
Master of Laser Dentistry
Colton, CA

Jim Dunn, DDS
Associate Professor of
Restorative Dentistry
Loma Linda University
Loma Linda, CA

George Freedman, DDS
International Lecturer, Author
Toronto, Canada

Rodrick Loud, DDS
Private Practitioner
Shreveport, LA

Fay Goldstep, DMD
International Lecturer
Toronto, Canada

7405 Westfield Blvd
Indianapolis, IN 46240 USA
www.amdlasers.com

Tel: (866) 999-2435
Fax: +1 (317) 202-9530
Fax: +1 (678) 869-4108
should be a space of 0.5 mm to 1 mm between the buccal plate and the anterior surface of the fixture. The site was further prepared using the standard drill sequence.

A Nobel Speedy Replace regular platform fixture (4 mm x 15 mm) was then placed, which stopped at a torque value of 55 Ncm. It is recommended that if a torque value of 55 Ncm cannot be achieved, the implant should not be brought into immediate function.

A cover screw should be used and the implant submerged; therefore, some other temporary measure such as a Maryland Bridge should be used. In these conditions, the root could even be sectioned from the extracted tooth and the crown bonded to the adjacent tooth.

Primary stability is very important in this procedure as the bone support needs to be strong enough to support the fixture and prevent micromotion from exceeding the threshold above which fibrous encapsulation prevails over osseointegration (Szmukler-Monclet et al. 1998).

An immediate provisional abutment (IPA) (Fig. 4) was fitted to the implant and fastened down to 20 Ncm. The abutment is non-engaging, screw-retained and inserted using a multi-unit abutment driver.

The abutment is non-engaging, screw-retained and inserted using a multi-unit abutment driver. A small amount of Tetric Flow composite (any flowable composite would also work) was placed in the provisional crown. A sufficient amount was used to engage with the metal of the IPA, but not spill out and touch the tissues. This was then light cured whilst the provisional was supported in the correct position.

The provisional was then removed and placed on another IPA connected to a protection analogue. The margins were then shaped and polished to ensure a smooth shoulder with no ledges or deficiencies against the IPA (Figs. 5, 6). The provisional crown was then cemented to the IPA with a very small amount of Temp-bond, ensuring that no cement extruded into the tissues.

Adjusting the provisional crown

It is important at this stage to ensure that the provisional crown is adjusted to ensure that there is no contact with the lower teeth in centric occlusion (Fig. 7) and no contact in any protractive or excursive movements (for example, not immediate loading).

The patient was advised to try to avoid the provisional crown and not to apply any forces while eating for the first four weeks.

The provisional crown was left in situ for six months (it is recommended that an absolute minimum of three months should be allowed for osseointegration before disturbing the immediately placed implant).
provisional crown was removed and a fixture-head impression taken of the implant.

The adjacent post crown (upper right central incisor) was also prepared for a new crown to ensure a good match for both central incisors.

A Procera zirconium abutment was connected to the fixture (Fig. 8). The abutment screw was fastened down at the recommended torque of 35 Ncm. Procera porcelain crowns were fitted to both central incisors (Fig. 9).

The implant-retained crown was cemented with Tempbond. It is recommended that the definitive restorations on implants should be cemented with temporary cement as this allows access to the implant, if necessary.

Immediate implant placement is gaining momentum. Clinicians should be aware, however, that this is a higher-risk procedure and should only be attempted by those surgeons with experience in dental implant surgery particularly when dealing with the esthetic zone.

References

Fig. 8: Provisional crown being manufactured on IPA.

Fig. 9: Internal hex, which has been created by curing flowable composite over the IPA.

Fig. 10: Final restorations 18 months after fitting.

About the author
Dr. Graham Magee qualified at Liverpool University in 1978 and in 1995 he created the Chester Dental Implant Centre within the general practice where he was a partner. Graham has undergone extensive postgraduate training to develop his skills in dental implant surgery and cosmetic dentistry including a master’s degree in dental implantology from Sheffield University. He continues with his postgraduate education regularly attending courses in Britain, Sweden, France and America and also gives lectures on the aspects of dental implantology and CT scanning and 3-D planning in advanced dental implant therapy. Graham also runs postgraduate training courses in implant dentistry for dental practitioners in his practice and is a member of the Association of Dental Implantology and of the American Academy of Osseointegration. To contact Graham or for further information on Chester Dental Implant Centre, call +44 (12) 44 540 177.