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INHERENT CHALLENGES OF IMMEDIATE IMPLANT PLACEMENT IN THE AESTHETIC ZONE: A CASE REPORT
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INHERENT CHALLENGES OF IMMEDIATE IMPLANT PLACEMENT IN THE AESTHETIC ZONE: A CASE REPORT

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SUMMARY

Replacement of missing teeth with implant borne prostheses has become generally acceptable in the field of dentistry. The traditional "Branemark protocol" has advocated for a period of healing after extraction before placement of implants. This presents an aesthetic challenge and the ensuing bone resorption also complicates the ideal placement of the implant fixture. Immediate placement of the implant presents a solution to these challenges. This case report describes the management of an anterior missing tooth utilising an immediate implant and guided bone regeneration. Soft tissue recession of the adjacent tooth and a reaction to the barrier membrane were encountered. Whereas this technique may be satisfactory for management of tooth loss in the aesthetic zone, clinicians should be aware of the challenges they may encounter and be prepared to manage them.

INTRODUCTION

The original "Branemark protocol" advocated for fully healed alveolar ridges before implants were placed (1). This provided for reliable and predictable osseointegration of the implant fixture and subsequent restoration of the implants. Placement of implants in fresh extraction sockets and partially healed alveolar ridges (2,3) are modifications introduced over the last 20 years. These techniques have been referred to as immediate placement. They have been made possible by implant surface modifications that encourage better and faster osseointegration (4). However immediate implants may present challenges including reaction to the barrier membrane and gingival recession of the adjacent teeth as encountered in the present case.

CASE REPORT

A 52-year-old man with a non-remarkable medical history presented with a chief complaint of a fractured right central incisor that had been endodontically managed previously (Figure 1 a). The examination and radiographs revealed posterior full-coverage porcelain fused to metal (PFM) crowns. The occlusion was group function with no premature contacts. The recommended and accepted treatment plan was a

single implant-retained crown of the right central incisor. At surgery the tooth was extracted using a flapless approach utilising a periosteal to loosen the periodontal ligament. The root was then split vertically by a high speed diamond bur and extracted atraumatically. The socket was thoroughly curetted and irrigated with normal saline. The socket was absent of any pathology and there were four intact walls. The patient had a definitive thick gingival biotype (Figure 1 b).

Figure 1a

Fractured central incisor previously endodontically treated



Figure 1 b
Residual socket after atraumatic extraction



Through the extraction socket an osteotomy was prepared at the apex of the socket with the crest as a reference point. The osteotomy was completed apically to a length of 16 mm and a diameter of 4.1 mm as previously determined on cone beam computed tomography studies. This was achieved through serially increasing the drilling bur sizes as recommended by the manufacturer. Irrigation was used throughout the osteotomy procedure. Hard, possibly type D1 bone was encountered. A 4.1 by 16 mm implant (Zimmer Tapered Screw-Vent®MTX™Micro textured Titanium) was placed 3.0 mm below the adjacent cemento-enamel junction (left central incisor), slightly palatally (Figure 2). The remaining socket gap was filled with xenograft (OsteoBio1® Gen-Os) bone which is a cancellous-cortical heterologous particulate bone mix (Figure 3 a). A barrier membrane (OsteoBio1® Evolution) was placed and primary closure was achieved using a resorbable suture (Figure 3b). The patient was discharged on 1 mg oral dexamethasone, and ibuprofen in addition to a chlorhexidine mouthwash.

Figure 2
Implant inserted to 3.0 mm below level of adjacent cemento-enamel junction and primary stability achieved



Figure 3 a
Bone defect grafted and membrane placed



Figure 3 b
Primary closure achieved using a resorbable suture



On day three marked inflammation and loosening of sutures around the surgical site was noted and was deemed to have been a reaction to the barrier membrane. This was observed to resolve over ten days. However a recession of 3 mm was evident on the twelfth day. A removable acrylic denture relieved on the alveolar ridge surface was used as a provisional prosthesis during the healing period.

Twelve weeks after placement, the implant was exposed and a healing collar placed for a further two weeks. Good healing and sculpting of the soft tissue was achieved (Figure 4). Impressions were taken using polyether impression material (Impregum [3MESPE]) through the closed tray method and a pre-contoured abutment selected. The final restoration was inserted one week later. The abutment was torqued to 35 Ncm and the aesthetic crown was cemented (Figure 5). The extent of the smile the recession did not cause a significant aesthetic concern to the patient thus he declined further procedures (Figure 6).

Figure 4

Good soft tissue healing and sculpting ready for impression procedures

**Figure 5**

Final crown cemented, recession on the adjacent tooth

**Figure 6**

Acceptable aesthetics



DISCUSSION

In the management of missing anterior teeth several options are available (5). In the present case a post and core crown would have been considered after orthodontic root extrusion. This could lead to a reduced root to crown ratio. Furthermore, it could have been more expensive and taken a longer treatment schedule. On the other hand extraction and use of crown and bridge would have meant the unnecessary preparation of the 21 and removal of the porcelain fused to metal crown already on the 12. Placement of an immediate dental implant was, therefore, the best alternative. Buser *et al* (2009) have shown in 20 consecutive cases that a better outcome is achieved if bone regeneration is done simultaneously at the time of implant placement. Soft tissue recession around immediate placed implants is a commonly known complication (7,8). Both the patient and clinician should be prepared for this outcomes and take every step to mitigate it. Better osseointegration will minimise bone loss and subsequently less soft tissue recession. In this case this was ensured by the use of a long implant to achieve primary stability at the apical region as well as increasing the surface area for osseointegration. Further, the implant chosen had surface modification (micro textured) to improve bone to implant contact (9).

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CONFLICT OF INTEREST

All the authors report no conflict of interest.

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