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Immediate Molar Implant Placement

Managing patient expectations

CASE REPORT

History and Initial Presentation

A 23-year-old healthy woman presented with an ongoing infection of tooth #36. As per the patient's recall of the events, the tooth was originally endodontically treated 10 months earlier, and immediately afterwards the patient experienced discomfort which did not subside for over one month. Shortly thereafter, tooth #36 became acutely infected and a second attempt was made at endodontic success through anterograde re-treatment. What ensued was a series of follow-up appointments and oral antibiotic regimens. Between dental re-assessment appointments and waiting to see if the tooth would improve, approximately six months elapsed. In the meantime, tooth #36 developed a rapidly enlarging radicular cyst and concomitant draining abscess (Figure 1). It was this stage at which the patient presented to my office for consultation and definitive treatment of the area.

Figure 1
Initial clinical appearance of tooth # 36.

Diagnosis and Treatment Plan

Tooth #36 was diagnosed with a hopeless prognosis. It exhibited less than grade one mobility and a buccally draining fistula. The radiograph of #36 showed a periapical bony lesion and frank bone loss (Figure 2). The conventional treatment for this type of case would typically include the following steps: extraction of the tooth, up to three weeks delay for resolution of the infection, surgical re-entry for ridge preservation with particulate bone grafting and collagen membrane placement, a three to six-month healing period, implant placement, an additional three to six-month healing period and final attachment of the prosthesis to the osseointegrated fixture.

In this case, the following treatment plan was recommended:

- extraction of tooth #36; followed by
- immediate implant placement; combined with
- a particulate bone graft as well as plasma rich in growth factors (PRGF).

This is a protocol which would greatly reduce the treatment time, the number of surgical procedures required, the

Figure 2
Initial radiographic appearance of tooth #36. Note periapical lesion and bone loss.

frequency of antibiotic coverage, and the final cost for the replacement of the tooth. The case was completed within six months, as compared to the conventional approach which could result in treatment time of up to or beyond one year.

Surgical and Restorative Procedure

Initial treatment involved a forceps extraction of tooth #36 with vigorous curettage of the defect and complete removal of granulation tissue. This revealed an empty socket with complete buccal bone loss and large bony deficiency (Figure 3). In order to be used later as an autograft, the interseptal bone was removed with a ronguer. A five by 12 millimeter Biohorizons Laser-Lok implant was placed, relying on apical fixation only due to insufficient bone volume around the fixture (Figure 4). The autograft taken from the interseptal bone was then placed on the buccal surface of the implant apically, to promote osseoinduction and new bone formation (Figure 5). Immediately prior to use, this autograft was soaked in a previously-obtained F3 growth factor rich plasma layer.[1]

Next, Mineross (Biohorizons) cortico-cancellous FDBA[2], also soaked in F3 growth factor, was placed in the bony deficiencies (Figure 6). Bio-oss (Giestlich) was then embedded in the F2 plasma layer and activated with calcium chloride to form a mineralized xenograft "pancake" (xenograft in a biologically-active carrier — Figure 7). Addition of this "pancake" forms the buccal-most layer of the composite graft. This occlusive buccal wall will permit bone regeneration without soft tissue ingrowth.

A cover screw was secured to the implant and the activated F1[3] fibrin-rich plasma membrane (Figure 8) was placed over top to completely seal the socket (Figure 9). The tissue was then

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Figure 3
Extraction reveals socket with complete buccal bone loss and large bony deficiency.

Figure 4
Implant fixture in position. Note insufficient bone volume around mesial, buccal and distal surfaces.

Figure 5
Placement of autograft taken from interseptal bone on the buccal surface of the implant apically.

Figure 6
Mineross cortico-cancellous FDBA soaked in F3 growth factors is placed in the bony deficiencies as the first or primary layer.

Figure 7
Bio-oss (Giestlich) xenograft "pancake".

Figure 8
Activated F1 fibrin-rich plasma membrane.

Figure 9
Final position of F1 membrane, showing complete sealing of the socket.

sutured using 4-0 chromic gut. Standard antibiotic and analgesic regimens were then prescribed for the patient.

Ten days post-operatively, the sutures were removed and excellent soft tissue healing as well as initial epithelial creep over the socket was noted. Four months later, re-entry revealed abundant bone regeneration with complete implant submersion (Figures 10 & 11). Using a No. 4 round bur, osteoplasty to uncover the top of the implant fixture was carried out. A healing abutment was then attached to the fixture and the tissues were re-approximated using 4-0 chromic gut suture (Figure 12).

At the five-month mark, laser gingivectomy was carried out to remove soft tissue overgrowth and to create the ideal gingival cuff for implant crown emergence (Figure 13). Six months post-surgery, the gingival cuff appears healthy and ready to accept the implant crown, so an impression was taken with PVS material and a transfer coping. One week later, the final screw-retained implant crown was inserted (Fig 14). Ideal papilla formation and thick, keratinized gingival tissue was achieved. Composite restorative material was used to fill the occlusal access opening.

Post-Operative Assessment

At the one-month follow-up appointment, everything appeared stable and the case seemed to be a great success. Unfortunately, the patient did not share this view and was unhappy with the final result. It turned out that the patient was dissatisfied with the occlusal composite plug in the access opening. She objected to the appearance of "a dark spot on my new tooth". In light of this information, the crown was removed and a healing abutment was placed surrounded by a flowable composite, in order to maintain the gingival architecture, while a new cement-retained crown was fabricated (Figure 15).

Approximately one week later, the composite and healing abutment was

Figure 10 & 11
Radiographic and clinical appearance four-months post-operatively, showing implant completely submerged.

Figure 12
Healing abutment in position.

Figure 13
Appearance of fixture head following laser gingivectomy.

Figure 14
Screw-retained implant crown with composite resin covering access opening on occlusal surface.

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Figure 15
Healing abutment with flowable composite placed to maintain gingival contours.

Figure 16
Appearance of gingiva prior to final crown insertion.

removed, revealing a well maintained gingival architecture (Figure 16). The final crown was cement-retained on an adequately torqued abutment. The result was highly cosmetic, with no occlusal access opening, thereby satisfying the patient's esthetic needs (Figures 17 & 18).

Conclusions

The key learning point of this case is the importance of clearly understanding a patient's expectations. From a clinician's perspective, the case was a success. In contrast to the conventional surgical approach, this procedure was quicker, less expensive, and required fewer appointments and surgeries. However, the initial outcome should not be considered a success, because in the eyes of the patient the case failed. A lack of understanding of the patient's needs and desires led directly to the patient's final disapproval. Fortunately, as has been described, there was a simple solution. Changing from a screw-retained crown to a cement-retained crown helped to achieve true success, as defined by this patient's acceptance of the final result.

Dr. Raj Chopra is a 2000 graduate of the Schulich School of Medicine & Dentistry at Western University. He is a Fellow of the International Congress of Oral Implantologists and currently maintains a private practice in Mississauga, Ont. Dr. Chopra may be reached at 905-270-0007 or at rchopra1@gmail.com.

References

1 F3 is the growth-factor-rich plasma layer which is used to bioactivate the implant surface and all allo- and xenograft materials in this case.
2 FDBA is freeze dried bone allograft.
3 F1 is the fibrin-rich layer of plasma that is used to form the biologic membrane used to seal the socket in this case.

Figure 17 & 18
Clinical appearance of cement-retained crown in position.