Immediate Implant Placement Along With Guided Bone Regeneration GBR – A Case Report

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ABSTRACT: The goal of implant dentistry is to provide a realistic treatment alternative for patients with tooth loss. The "gold standard" implant treatment protocol has been recently challenged by various studies and experiments, which focussed on shortening the treatment time and by reducing the number of surgical procedures. New procedures have been studied in which implants are inserted at the time of extraction of the tooth, known as immediate implants. Latest reports have shown the effective placement of dental implants into fresh extraction sockets in the anterior as well as in the molar areas. This case report describes the placement of immediate implant following the extraction of a fractured lower left mandibular molar tooth.

KEYWORD: Guided Bone Regeneration, immediate implant placement.

INTRODUCTION

Over the past quarter century, dentistry has undergone numerous changes, however no developments have been significant than those in the field of implant dentistry.[1]The goal of implant dentistry is to provide a realistic treatment alternative for patients with tooth loss.[2] An implant is "any object or material such as an alloplastic substance or other tissue, which is partially or completely inserted or grafted into the body for therapeutic, diagnostic, prosthetic or experimental purposes."[3] Various implant placement protocols have been developed over the decades.[4] Following the extraction of tooth, there are various methods of placement of dental implants. The methods include immediate post extraction implant placement, delayed immediate post-extraction implant placement (two weeks to three months after extraction),late implantation (three months or more after tooth extraction).[5] Among these, immediate implant placement has become increasingly common.

Immediate implant placement which is defined as the placement of dental implant immediately into fresh extraction socket site after tooth extraction, has been considered as a predictable and widely accepted procedure.[6]The immediate implant

They include the reduction in waiting time post extraction for the bone formation and reduced crestal bone loss in immediate implant placement when compared to the delayed implants.[7]Pedro et al. reported 93.5% survival rate of immediately placed implants for 5 year period.[8]

This case report describes the extraction of a fractured lower left mandibular molar tooth, followed by immediate implant placement in the prepared socket and the prosthetic phase.

CASE REPORT

A 40 year old male patient reported to the department with the chief complaint of fractured left lower back teeth since two weeks. The patient presented with a history of root canal treatment with the same tooth 3 years back. On clinical examination, mandibular left first molar (36) was found to have vertical fracture (Figure 1). Radiographic evaluation revealed that the tooth was endodontically treated. Horizontal bone loss was noticed in the inter-radicular area and distalaspect of the tooth extending upto the junction of middle and apical third of the root. On the mesial aspect, horizontal bone loss extending upto the apical third of the root was observed (Figure 2).

All the treatment options were explained to the patient. The patient opted for immediate implant placement. With the patient's consent, immediate implant placement following extraction of the mandibular left first molar was chosen as the treatment plan. The procedure was explained to the patient.

Before surgery**,** the patient was advised to rinse his mouth with chlorhexidene mouthwash (0.2%). After the administration of local anesthesia**,** the fractured mandibular left first molar was extracted with help of forceps (Figure 3).As preservation of alveolar bone is key to success of immediate implants, care was taken so that the extraction was atraumatic. Following extraction, the site was debrided using curettes. The socket was then irrigated using Povidine – Iodine.

Placement of immediate implant was planned. The length and width of the extracted root was measured to determine the length and diameter of the implant to be placed. Sequential drilling was done upto adequate length into the socket and Alpha-Bio Spiral implant of size 4.2 x 11.5mm was placed in the socket with an insertion torque of 45 Ncm (Figure 4). Implant first thread was placed 1.5 mm apical to crestal bone of the socket and adequate primary stability was achieved. Periapical radiograph was taken following the surgery (Figure 5). Healing abutment was placed over the implant (Figure 6).

Following placement of implant, Osseograft bone graft was mixed with Platelet Rich Fibrin (PRF) and was packed between the implant and socket wall. This was followed by the placement of absorbable collagen membrane Healiguide (Figure 7 and 8).

Preparation of Platelet Rich Fibrin(PRF)

The protocol established by Choukroun et al. was followed in the preparation of PRF.[9]Intravenous blood was drawn from the antecubital vein just before the surgery and was collected in 10ml of sterile tube in the absence of an anticoagulant. The blood was then centrifuged immediately at 2,700 rpm for 12 minutes using a tabletop centrifuging machine.

The resultant product consists of three layers:

1. The topmost layer consists of acellular platelet poor plasma (PPP).
2. PRF clot in the center.
3. Red blood cells (RBCs) at the bottom.

A sterile tweezer was used to separate PRF from the RBCs after the removal of PPP and it was then transferred to a sterile dapen dish.

The buccal and lingual soft tissues were then sutured using 3-0 silk sutures (Figure 9 and 10).Appropriate antibiotic (amoxicillin 500 mg, 3 times daily for 7 days) and analgesic (ibuprofen 800 mg, every 4 to 6 hours as needed) were prescribed and post operative instructions were given.

Patient was recalled after one week. On follow up visit after a week, the implant threads were found to be partially exposed (Figure 11). The area was then packed with Demineralised Freeze Dried Bone Allograft (DFDBA) bone graft and sutured.

The patient was recalled for the prosthetic procedures. An open tray impression was made with condensation silicone (Figure 12). The patient was then recalled and a screw retained porcelain fused metal crown was cemented using luting type of GIC cement (Figure 13).

Figure 1: Pre-operative Photograph

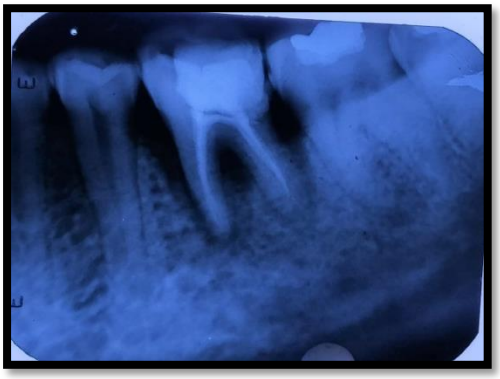

Figure 2: Pre-operative radiograph

Figure 3: A traumatically extracted 36

Figure 4: Placement of implant

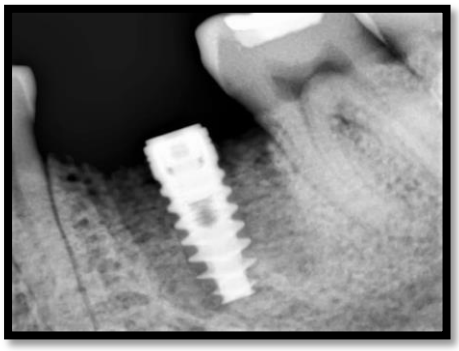

Figure 5: Radiograph after implant placement

Figure 6 : Healing abutment placed

Figure 7: Placement of bone graft and PRF

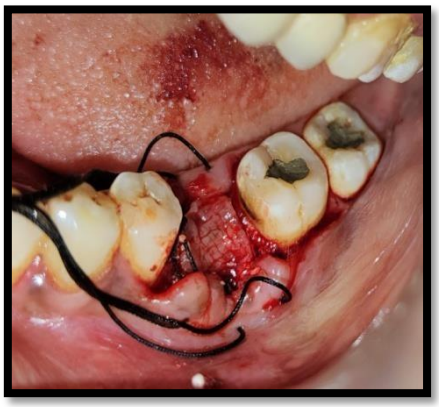

Figure 8: Placement of bone graft, PRF and collagen membrane

Figure 9: Sutures placed

Figure 10: Sutures placed

Figure 11 : Exposed implant

Figure 12 : Open tray impression made

Figure 13: Screw retained porcelain fused metal crown cemented

DISCUSSION

Immediate placement of a dental implant in an extraction socket was first described by Schulte and Heimke in 1976.[10]Various studies have documented the immediate implant placement in fresh extraction sockets with bone graft materials and/or covering membranes. While this method can be effectively implemented for single-rooted teeth, very little is known about the use of this protocol for multi-rooted teeth.[11]

Immediate implant placement can be the treatment of choice when tooth extraction is due to trauma, endodontic lesions, fracture of root, root resorption, root perforation, unfavourable crown to root ratio and when bony walls of alveolus are still intact.[12]In this present case, immediate implant placement was planned after extraction of a fractured endodontically treated tooth.

Immediate implant placement into fresh alveolus can normally lead to the presence of a gap between the occlusal portion of an implant and bone walls. To achieve osseointegration, synthetic bone substitutes, membranes, or a combination of these can be used to achieve bone formation in such defects.[13] In this case, a combination of Osseograft, Healiguide collagen membrane and PRF was placed.

Krump and Barnett in their study reported high success rates when immediate implants were placed at the time of extraction.[14] Successful results have been reported by Ashman when immediate implantation was done at chronically infected sites.[15] Ferrara et al. carried out a study combining immediate placement and early loading of 33 implants and they observed satisfactory aesthetic and functional results from patient's point of view.[16]

The initial stability of the implant is the principal factor evaluating the effectiveness of immediate implant placement. The extraction site must be examined to ensure if it is appropriate for immediate implant placement. For proper healing to take place, any micromovements between implant and the surrounding bone should be avoided.[11]

The immediate implant placement have the following advantages:[17]

a) Fewer surgical interventions

b) Reduced treatment time

c) Optimal three-dimensional implant positioning

d) Preservation of width and height of alveolar bone at the side of tooth extraction

e) Soft tissue aesthetics.

The disadvantages are the presence of periapical pathology, absence of keratinized tissue, morphology of the side, thin tissue biotype, absence of complete soft tissue coverage over the extraction socket.[7]

Excellent esthetic rehabilitation was obtained in this case and the patient was satisfied with the treatment results.

Although this technique is promising and the clinical results have been good for the authors during intraoperation management and post-operative check-ups, controlled randomized clinical testing is necessary, using a comparative method, to assess the benefits and limitations of this technique in the long term.

CONCLUSION

Immediate implant placement following tooth extraction has been considered as a reliable and predictable treatment option for tooth loss. This is considered technique sensitive but offers certain advantages like reduced treatment time, minimum post extraction complications, minimally invasive surgical technique and preservation of gingival

aesthetics. However careful case selection, diagnosis and proper treatment planning, meticulous post-operative care preceded by a good surgical and prosthetic protocol are the keys to the long term success of the immediate implants.

REFERENCES

1. Kurien VTV, Shamsuddeen S. Management and maintenance of dental implant failures. J Res Adv Dent. 2020;10:3:70-77.
2. Dias SC, Jacob SA, Ashok K. Immediate Implant Placement – to the Rescue – A Case Report. J Interdiscipl Med Dent Sci. 2016;4: 198.
3. The Academy of Prosthodontics. The Glossary of Prosthodontic Terms. 2005; 94(1):44
4. Wu D, Zhou L, Lin J, Chen J, Huang W, Chen Y. Immediate implant placement in anterior teeth with grafting material of autogenous tooth bone vsxenogenic bone. BMC Oral Health. 2019;19:266.
5. Swathi KV. Immediate implants placement – A Review. J. Pharm. Sci. & Res. 2016; 8(11): 1315-1317
6. Schwart ZA., Gulayev N &Choushu G. (2000). Immediate versus non-immediate implantation for full arch fixed reconstruction following extraction of all residual teeth. A retrospective comparative study. J Periodontol. 2000; 71: 923-9
7. Ebenezer V, Balakrishnan K, Asir RV, Sragunar B. Immediate placement of endosseous implants into the extraction sockets. J Pharm Bioall Sci. 2015;7:S234-7.
8. Tortamano P, OtávioAlves Camargo L, Stella Bello-Silva M, HirokuniKanashiro L. Immediate implant placement and restoration in the esthetic zone: a prospective study with 18 months of follow-up. International Journal of Oral & Maxillofacial Implants. 2010 Apr 1;25(2).
9. Choukroun J, Adda F, Schoeffler C, Vervelle A. An opportunity in perio-implantology:The PRF. Implantodontie 2000;42:55-62.
10. Schulte W, Heimke G. The Tubingen immediate implant [inGerman]. Quintessenz 1976;27:17–23.
11. Gregory G Z, Adrian K, Oliver H.Immediate Implant Placement in Fresh Mandibular Molar Extraction Socket: 8-Year Results. A Case Report.J Oral Implantol.2010;36 (2): 145–151.
12. Singh A, Gupta A, Yadav A, Chaturvedi TP, Bhatnagar A, Singh BP. Immediate placement of implant in fresh extraction socket with early loading. ContempClin Dent 2012;3:S219-22.
13. Covani U, Cornelini R, Barone A. Bucco-lingual bone remodelling around implants placed into immediate extraction sockets: A case series. J Periodontol.2003;74: 268-273.
14. Krump JL, Barnett BG. The immediate implant: a treatment alternative. International Journal of Oral & Maxillofacial Implants. 1991 Mar 1;6(1).
15. Ashman A. An immediate tooth root replacement: an implant cylinder and synthetic bone combination. J Oral Implantol.1996; 16:28-38.
16. Ferrara A, Galli C, Mauro G, Macaluso GM. Immediate provisional restoration of postextraction implants for maxillary single-tooth replacement. Int J Periodontics Restorative Dent 2006;26:371-7.
17. Dixit S, Mendhe A, Deshpande S, Ghadage R. Immediate Implant Placement for Root Fracture: A Case Report. IOSR-JDMS.2019; 18(4):64-68.

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