IMMEDIATE IMPLANT PLACEMENT ALONG WITH GUIDED BONE REGENERATION IN MANDIBULAR ANTERIOR REGION – A CASE REPORT.

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Abstract:

Implant placement is growing rapidly in dental practice as a means of tooth replacement. Immediate Implant placement is an advanced technique which involves placing a dental implant into the tooth socket immediately after extraction. This procedure reduces the overall duration of treatment for the patient. It preserves the underlying bone and follows the natural root anatomy. The success of an immediate implant relies on meticulous planning and refined operative skills. The following case report describes one such case where an implant was placed immediately after extraction of a root stump along with the use of type I collagen membrane along with xenograft material.

Keywords: Immediate implant, Guided bone regeneration**,** Xenograft, Type I collagen, Dental Implant

Introduction:

Implants have been considered as a best option for replacement of a missing tooth in everyday practice. With its higher success rate and comparatively increased functional support, implants are also the first choice of patients. Immediate implant placement gives the patient the advantage of having a tooth replaced immediately after its extraction. It has several advantages including maintenance of bone density, preservation of bone height and width, reduced waiting time for the patient, reduced number of surgical interventions and better esthetics.[1] However, the success of an immediate implant relies on the clinical experience of the operator, type of surgical approach followed and the type of restoration given.[2]

Case Report

A 26 year old male patient came to our department with the chief complaint of missing teeth in his lower front tooth region for 1 month. Clinical examination showed missing tooth in relation to 42 (Mandibular right lateral incisor) [Fig 1]. Intra Oral Periapical radiograph (IOPA) revealed a retained root stump in relation to 42 [Fig 2]. Considering the age of the patient and his compliance with dental implants we decided to place an implant immediately after

extraction of the root stump.

Fig 1 – Pre operative view showing missing 42

Fig 2 – IOPA showing root stump in 42

The patient was initially put on antibiotics, Amoxicillin 500mg twice daily for 7 days. Oral prophylaxis was done and chlorhexidine mouth wash was prescribed to reinforce oral hygiene maintenance.

On the day of surgery, anesthesia was obtained by local infiltration of 2% ligocaine with adrenaline. The root stump was extracted with minimum trauma to the surrounding tissues. A full thickness mucoperiosteal flap was reflected and extraction of the root stump was done using elevators instead of forceps [Fig 3], [Fig 4]. The dimensions of the socket were also measured to determine the length and height of the implant to be placed. The size of the implant to be placed was determined to be 3.75mm diameter X 11.5mm length.

Fig 3 – Flap elevated and root stump exposed

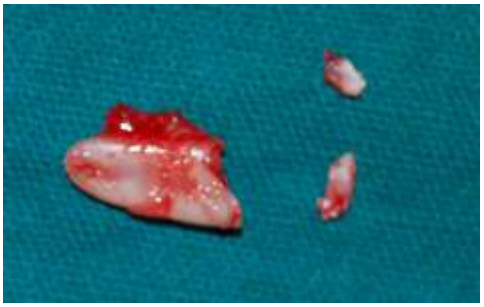

Fig 4 – Extracted Root stump

Very cautiously, the apical portion of the socket was prepared using drills. The implant was placed 2mm apical to the level of the crest of the alveolar bone. A cover screw was placed [Fig 5]. To fill the space surrounding the neck of the implant, bone graft (Osseograft ®) was used[Fig 6]. A bio degradable guided tissue membrane (Healiguide®) was used to cover the grafted site [Fig 7]. It was tucked in under the labial and lingual flaps and sutures were placed [Fig 8].

Fig 5 – Implant placed into the socket

Fig 6 – Osseograft® placed surrounding the implant

Fig 7 – Healiguide® membrane placed

Fig 8 – Sutured placed

A post operative IOPA was taken to assess the placement of implant [Fig 9]. The radiograph showed very good placement of implant with respect to surrounding structures. The patient was given antibiotics, analgesics and a mouth rinse to maintain post operative oral hygiene.

Fig 9 – Post operative IOPA showing proper implant placement

At 3 months interval, an IOPA was taken to assess the bone levels surrounding the implant. Radiograph showed no signs of bone loss or pathology. Patient was completely asymptomatic and comfortable. The implant did not affect the adjacent tooth in any way. The abutment was placed by giving just a crestal incision. The cover screw was removed using a hex drive. The abutment was placed and adjusted according to the required occlusal clearance.

A temporary acrylic crown was given for an initial period of 3 months. At the end of 3 months the patient was given a metal ceramic permanent restoration [Fig 10]. For this period of 6 months the patient was completely asymptomatic.

Fig 10 – 6 months post operative view with permanent restoration

Discussion

Immediate implant placement is advocated mainly to preserve the architecture and dimensions of the bone surrounding it. It helps to reduce the amount of time between the extraction of the tooth and its replacement. The number of surgical appointments is also considerably reduced when the patient opts for an immediate implant.[3]

The benefits of using of prophylactic antibiotics prior to implant surgery have been strongly supported by scientific evidence. 2 grams of Amoxicillin given orally, 1 hour preoperatively have been found to reduce post operative complications and implant failure.[4] In the present case, the patient was given amoxicillin 500mg twice daily for 7 days.

The technique to be followed while extracting a tooth for immediate implant placement varies depending on the case. The extraction must be done atraumatically with minimal damage to the buccal plate. The extraction can be done with or without elevating a flap. The periosteum must be left intact on the buccal plate to ensure vascularity.[6]

Minimal site preparation is required for immediate implant placement as it is placed directly into the socket. Primary stability determines the initial as well as long term success of the implant. To achieve this, the implant must be placed 3 mm apical to the level of the alveolar crest and 3mm the level of the apical portion of the socket bone.[7]

Guided bone regeneration involves placement of barrier membranes with or without the inclusion of bone grafts to augment the bone defects around an implant. Bone grafts are used to fill the spaces formed between the implant and the buccal bone. Several types of bone grafts have been used for this process. Demineralised bone grafts have been proven to be more beneficial when compared to the others. The provide better healing, they prevent soft tissue recession and provide better bone – implant contact.[8]

Bio resorbable collagen membrane placed around the implant has several functions. It

mainly helps in formation of new bone. It prevents the integration of fibrous connective tissue into the bone, thereby acting as a barrier.[9] It undergoes resorption after a period of 6 to 9 months.

Implants placed immediately after extraction can be loaded in 3 ways. They can be loaded immediately after placement of the implant (Immediate loading), they can be loaded after a period of 3 weeks (Early loading), they can be loaded after a period of 3 months(Conventional loading) or they can be loaded after a period of 6 months or more (Delayed loading)[9].

In this case, it was decided that the implant will be loaded after a healing period of 3 months in spite of achieving good primary stability. The decision was made because the implant was placed in an area of less bone density and a healing period was necessary to allow proper healing and bone formation[10].

As mentioned earlier, immediate implants have several advantages. There are also few limitations to consider.[11] Failure to achieve primary stability can cause implant failure. There might not be enough soft tissue to cover the implant when placed in the extraction socket. This leaves the implant exposed and chances of infection are increased. Close proximity to adjacent teeth, fracture of buccal wall, presence of pre existing infections are some of the short comings to be considered.

With proper case selection, planning and execution, immediate implant placement can be considered as an excellent option for single and multiple tooth replacement[12].

Conclusion

Immediate implant placement is a fast growing treatment option for replacement of missing tooth. It has highest patient preference. It allows minimal bone loss due to healing. With all these advantages, immediate implant placement has some limitations as well. Case selection is one main factor to be considered while placing an immediate implant. Immediate implants cannot be placed in cases of pre existing periapical lesions, malpositioned tooth and in areas of bone defects. Further studies with long term follow up are required to assess the success and longevity of immediate implants.

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