

Esthetic and Prosthetic Rehabilitation of Maxillary Lateral Incisor –A Case Report

Neetha J Shetty*

Associate Professor, Department of Periodontology, Manipal College of Dental Sciences, Mangalore, MAHE LHH Road, Hampankatte, Mangalore, Karnataka, India

***Corresponding Author:** Neetha J Shetty, Associate Professor, Department of Periodontology, Manipal College of Dental Sciences, Mangalore, MAHE LHH Road, Hampankatte, Mangalore, Karnataka, India.

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Abstract

The key factors in achieving successful outcomes after implant placement immediately after tooth extraction is a correct diagnosis and treatment planning. The efficacy of immediate implant placement has been established and shown to be predictable if reasonable guidelines are followed. The reasons for tooth extraction may include but not limit to: insufficient crown to root ratios, remaining root length, periodontal attachment levels, periodontal health of teeth adjacent to the proposed implant sites, unrestorable caries, root fractures with large endodontic posts and questionable teeth in need of endodontic retreatment. The most esthetically challenging in implant placement is the maxillary anterior region. The reason being that tooth loss leads to resorption of bone and collapse in gingival architecture leading to aesthetic compromise and inadequate bone for implant placement. Also, the advantages of placing Immediate implant into freshly extracted socket reduces the treatment time, cost, and increases the patient comfort.

Keywords: Esthetic; Prosthetic Rehabilitation

Background

This case report describes the procedure for immediate implant placement in fresh extraction socket. Clinical and radiographic examination revealed width and length of the tooth for selecting implant size and design. Implant was successfully loaded and was functional during 24 months follow up period.

Case Presentation

In 2017, a healthy 25 -year-old male reported for evaluation of a fractured upper right lateral incisor (Figure-1a). On consultation with an endodontist, it was decided to extract the tooth and go for an immediate implant placement as the patient was very much concerned about aesthetics. Patient was in good systemic as well as periodontal health. A thorough clinical evaluation and a CBCT was recorded (Figure-1b) and analysed, after which the patient was posted for implant placement as he did not have any facial plate deformity. The patient was explained about the procedure and a consent form was duly signed by the patient.

The area of interest was anaesthetized with 1:80,000 lignocaine hydrochloride. With a no. 15 scalpel blade, the supracrustal fibres were dissected. This was followed by the use of a peristome to sever the periodontal ligament fibres from the alveolar bone so that the tooth becomes loose, thereby extracting the tooth traumatically. The walls of the alveolar socket were found to be intact after extraction (Figure-1c). the socket was degranulated and curated for any remnant of periapical lesion. osteotomy was performed in a palatal position so as to not perforate the labial cortical bone, about 2 mm apical to the apex (Figure:1d). An implant of length 13 mm and diameter 4.5 mm was placed and primary stability was achieved with a torque of 20N cm² was achieved. since the torque achieved was less, it was decided to go for delayed loading and a gingival former was placed (Figure 2a). Post- operative instructions were given.

Investigations if relevant

- Complete hemogram was performed to rule out any systemic problems.
- CBCT of the area of interest was done.
- IOPA of the area of interest was taken.

Treatment if relevant

Antibiotics (amoxicillin 200 mg, thrice daily for 5 days) and analgesics (divon plus twice daily for two days) were prescribed.

Outcome and follow-up

After 5 months, an IOPA was taken to evaluate the implant and bone interface. The gingival former was removed revealing a good soft tissue contour. Impressions were taken for prosthetic rehabilitation using putty with light body for the maxillary arch and an alginate impression for the mandibular arch. The final ceramic crown was cemented after 1 week. After 1 year, radiographic and clinical follow up demonstrated successful result, meeting aesthetic and functional requirements (Figure:2b and c).

Discussion

A mandatory requirement when placing an immediate implant is atraumatic extraction. The best healing conditions is provided by attempting this [1]. Despite all the efforts, extracting a tooth results in severing the collagen fibres and blood vessels to the periodontal ligament causing trauma to the bundle bone. Extraction of tooth with or without flap elevation is a surgical consideration. Extracting a tooth with or without elevating a flap, is a surgical aspect that must be considered. Covani, *et al.* affirmed that flap elevation may cause alveolar bone resorption in the exposed area, whereas a flapless technique reduces patient discomfort, alterations in alveolar crest dimensional alterations, and better soft tissue quality around implant [2]. This also reduces post-surgical trauma, and by preserving the vascular supply integrity, as the periosteum is maintained [3]. The stages of alveolar healing are initiated as soon as the tooth is extracted [4]. It has been postulated that there is a horizontal resorption of bone dimension that amounts to 56% immediately after extraction [5,6] (Figure 1-7).

Also, when an implant is inserted immediately after an extraction, there is a void created between the buccal wall and the implant. Some authors suggest the filling of this void with a biomaterial in order to maintain hard tissue contour [7]. The clinician also has to consider that soft tissue will also go through the process of remodelling following implant placement [8].

Figure 1: Clinical presentation with fractured upper right lateral incisor

Figure 2: Cone beam computed tomography (CBCT) was done to rule out facial cortical plate bone deformities

Figure 3: Extraction of upper right lateral incisor was done as atraumatically as possible

Figure 4: Osteotomy done in the deepest part of the socket with care not to perforate the labial cortical bone

Figure 5: After Implant Placement

Figure 6: After complete rehabilitation

Immediate implants require a complicated and precise soft tissue management. Moreover, De Rouck, *et al.* demonstrate that using single immediate implants with instant previsualization, can help optimize aesthetics. It was concluded that this can limit the amount of midfacial soft tissue loss, being this area the most critical in aesthetic implant dentistry [9,10]. Nevertheless, if primary stability is not achieved, or the patient's case does not fit the ideal requirements for immediate previsualization, this should not be done, and therefore, a different type of treatment should be considered [11].

Conclusion

Based on the outcomes of the present report, it can be concluded that immediate implant placement may be a viable treatment option for cases requiring earliest restoration of teeth to be extracted. However, this approach is considered highly technique sensitive and requires expert dental implant team for its execution. Careful selection of cases, proper treatment plan and follow-up of surgical and prosthetic protocols are the keys to success.

Patient's Perspective

Patient was very satisfied with the aesthetic and functional outcome after the prosthesis on the implant.

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