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Simplified Method of Interimplant Papilla Preservation around Immediate Implant in the Maxillary Aesthetic Zone- A Case Report

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Immediate implant placement in the maxillary aesthetic zone and the maintenance of peri-implant soft tissue is a clinical challenge. The interimplant papilla and soft tissue depends on various factors like interimplant distance, thickness of the alveolar housing, peri-implant marginal bone, biologic width, gingival biotype, amount of keratinized tissue, tooth form, implant neck geometry, and abutment connection. The interimplant papilla in the aesthetic zones can be managed either surgically or non-surgically. Surgical methods include flapless technique, crestal-punch method or papillary reconstruction intraoperatively. Non-surgical methods include restorative, prosthetic and orthodontic techniques to maintain or achieve sufficient interimplant papilla for a pleasing esthetic outcome. This case report shows a simplified non-surgical method of preserving the interimplant papilla in the maxillary aesthetic zone.

Keywords: Tooth socket; dental implants; dental papilla.

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1. INTRODUCTION

Dental implants provide satisfactory options for patients with lost tooth due to the benefits provided by the implant supported prosthesis such as improved hygiene accessibility, improved esthetics, osseous preservation and reduced future maintenance [1]. Protocols are developed in which implants are placed immediately at the time of extraction of teeth termed as immediate implants [2]. Immediate implants has several advantages such as reduced number of surgical treatments, prevention of bone resorption, preserving the alveolar bone width in terms of height and width, reduction in time lag between tooth extraction and definitive placement of prosthetic restoration [3]. Factors essential to success immediate implant restoration includes initial implant stability, surgical technique, host and occlusal related factors [4-6].

Key to an aesthetically pleasing smile is proper management of the soft tissues around the natural teeth or implants. Aesthetic soft tissue contours are described by a harmoniously scalloped gingival line, avoidance of an abrupt change in clinical crown length between adjacent teeth, convex buccal mucosa of sufficient thickness and a distinct papilla [7]. Presence or absence of interdental/interimplant papilla is influenced by more than one factor such as size and shape of the contact area, interproximal space dimension and crestal alveolar bone height [8]. Therefore interproximal region more challenges if these factors are not taken into consideration. The present case reports a non-surgical method of preserving the interimplant papilla along with the implant placement in maxillary anterior esthetic zone.

2. CASE AND SURGICAL TECHNIQUE

A 25 year old male patient reported to the department of Periodontics, Saveetha dental college and hospitals with chief complaint of missing teeth in the upper front tooth region of the jaw. History revealed that the patient met with a road traffic accident and the tooth got avulsed at the same time. The patient did not report with avulsed tooth. Patient was completely examined for any other maxilla-facial fractures, or any hard tissue components penetrating the soft tissue. Following this the socket was thoroughly examined, irrigated and debrided to remove any foreign particles (Fig. 1). The patient was concerned about missing tooth in the esthetic zone and requested for an immediate replacement. He was given a choice of implant and since the patient preferred dental implant for tooth replacement, an immediate implant surgery was planned.

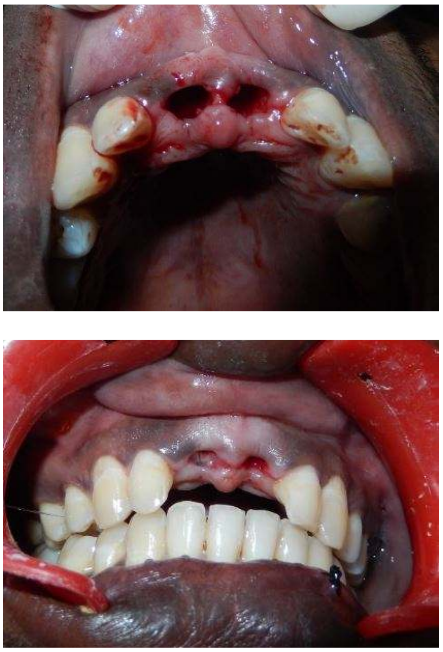

Fig. 1. Pre-operative 11, 21 avulsed site

A complete blood examination was done, and CBCT was taken to evaluate the alveolar bone topography. The blood parameters fell within normal limits and the alveolar socket was intact in relation to both the avulsed teeth corresponding to 11 and 12. Patient was prescribed with prophylactic antibiotic of Amoxycillin 500 mg and Piroxicam derivative 20 mg prior to the surgery. Immediate implant surgery was planned within 48 hours of tooth-avulsion.

3. SURGICAL PROCEDURE

Complete extra-oral asepsis was achieved with Betadine solution. Local anaesthesia (2% lignocaine hydrochloride) was achieved by local infiltration of the soft and hard tissue around 11 and 21 region on buccal and palatal aspects. Following successful anaesthesia, the socket was debrided completely exposing raw bone. Osteotomy site was prepared using sequential drills to the required height. Nobel Biocare implants of 13x4.3 mm were placed in relation to both 11 and 21 socket (Fig. 2). The dead space between the implant and the socket wall was

filled with Ossifi (Biphasic hydroxyapatite – β tricalcium phosphate). Both the implants had adequate primary stability. Guided tissue regeneration membrane (PerioCol-GTR) was individually placed on both implants with a punch in the center to accommodate cover screw, holding GTR membrane in position and suturing was done with 4-0 VICRYL absorbable surgical sutures at mesial and distal papilla of the avulsed site. Postoperative instructions and medication Amoxycillin 500 mg t.i.d, Piroxicam derivative 20 mg b.i.d was prescribed, and the patient was discharged.

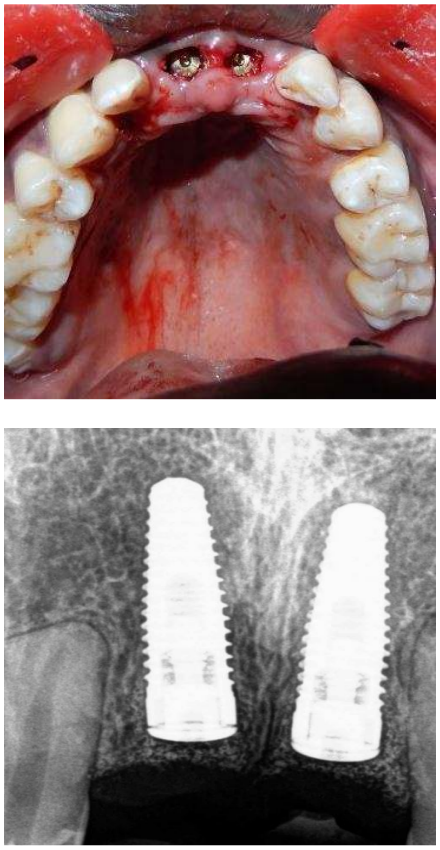

Fig. 2. Clinical and radiographic images of noble biocare implants of 13x4.5 mm placed in 11, 21 region

4. NON-SURGICAL MANGEMENT OF INTERDENTAL PAPILLA

On the day following implant placement, the site was inspected for adverse surgical outcomes. No gross swelling or inflammation was seen. After adequate anesthesia of the marginal periimplant tissues, shade and size matched acrylic teeth were selected to preserve the interimplant papilla and surrounding soft tissue. The necks of the teeth were submerged in the implant site and splinted to the adjacent teeth using a braided no. 23 stainless steel wire (Fig. 3). The rationale of submerging acrylic teeth in the site was to support interimplant papilla and peri-implant soft tissues for an esthetically enhanced emergence profile. Patient was reviewed after 2 days for oral hygiene maintenance and assessment of post-surgical complications if any. Following this visit, the patient was reviewed at weekly intervals for the same. After 2 weeks peri-implant tissues healed completely and was found to be closely adapted to the necks of the acrylic tooth on palatal and buccal aspect (Fig. 4). After 6 months crown was placed w.r.t 11, 21 and patient was highly pleased with the results obtained (Fig. 5).

Fig. 3. Placing provisional restoration using acrylic teeth in relation to 11, 21 to preserve the interimplant papilla and surrounding soft tissue

Fig. 4. Complete healing of soft tissue in 11, 21 region preserving the interimplant papilla

5. DISCUSSION

Placing dental implants in site of avulsed teeth proves to be challenging in terms of extent of trauma and feasibility of treatment. Post extraction changes can result in loss of buccal bone thus making the implant placement more

difficult [9]. Since both buccal and palatal bone were intact with no bone loss, option of placing implant was chosen as treatment plan with patient acceptance. Immediate implant placement reduced the number of surgical episodes as well as treatment time. One systematic review states that the immediate approach may require thorough debridement of extraction socket, prophylactic antibiotics, tissue regeneration and cases resulting in impaired implant to bone contact [10]. Also other randomized controlled studies have shown favorable results with limited complications and survival upto 3 years [11-12]. Since studies with long term follow up are lacking the predictability and success of placing dental implants immediately into the extraction and avulsed socket is still to be realized.

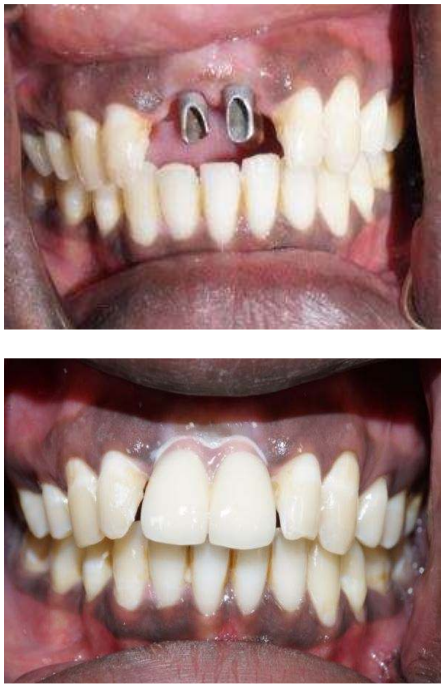

Fig. 5. Abutment followed by crown placement after 6 months

The concept of preserving gingival architecture by placing provisional restoration after atraumatic extraction was presented by Schlar which he termed as “The Bio-Col technique” [13]. In his original technique he recommended; (i) atraumatic extraction, (ii) perforation of the socket wall to create a bleeding surface, (iii) condensation of deproteinized bovine bone xenograft (Bio-Oss) filled to the osseous crest, (iv) placement of a collagen matrix material over the graft, (v) placement of horizontal mattress suture over the extraction site, (vi) cyanoacrylate placed over the suture and collagen to decrease the permeability of this barrier and (vii) finally placement of an ovate pontic into surgical site to preserve the gingival contour. In this case a modified Bio-Col technique where placement of horizontal mattress suture and cyanoacrylate was eliminated as advocated by Schlar, since implant was placed immediately into the avulsed socket followed by provisional restoration.

Numerous studies have been attempted to determine various ways to regenerate interdental papilla. Interdental papilla esthetics can be achieved either by soft tissue and hard tissue manipulation or by restorative attempt [14]. Sometimes combination of these techniques are required to correct the esthetic challenge in the interdental region. In this case since no soft and hard tissue defects were present, restorative method of preserving the interdental papilla was made. Jemt in 1999 proposed a technique of preserving the interdental papilla by means of placing a provisional temporary crown which acted as a guide to the soft tissue into the interdental space faster than healing abutments alone [15]. Studies performed by Jemt and Lekholm in 2003 showed that the interdental papilla were reported to have increased significantly in volume during the first year, and filling up the embrasure areas after 2 years of crown placement although there was a significant buccal and interproximal resorption of bone grafts was seen 2 years after implant placement [16]. Thus, placement of the abutment cylinder and crown seemed to plays a significant role for re-establishing interproximal tissue volume at the Implant supported single crowns.

6. CONCLUSION

Placement of provisional crown is simple and non-invasive. Also patient acceptance is better in placing such provisional crowns rather than other invasive procedures of hard and soft tissue. Thorough treatment planning is required for such cases for identifying the underlying defect and maintaining the interproximal height to achieve proper esthetics and satisfying the patients need.

CONSENT

All authors declare that written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Limor AA, George AZ. Clinical effectiveness of implant supported single tooth replacement. The toronto study. Int J Oral Maxillofac Implants. 1996;11:311-21.
2. Adell R, Ericsson B, Lekholm U. A long term follow-up study of osseointegrated implants in the treatment of totally edentulous jaws. Int J Oral Maxillofac Implants. 1990;5:347-59.
3. Covani U, Barone A, Cornelini R, Crespi R. Soft tissue healing around implants placed immediately after tooth extraction without incision: A clinical report. Int J Oral Maxillofac Implants. 2004;19(4):549–53.
4. Gapski R, Wang HL, Mascarenhas P, Lang NP. Critical review of immediate implant loading. Clin Oral Implants Res. 2003; 14(5):515–27.
5. Ottoni JMP, Oliveira ZFL, Mansini R, Cabral AM. Correlation between placement torque and survival of single-tooth implants. Int J Oral Maxillofac Implants. 2005;20(5):769–76.
6. Del Fabbro M, Testori T, Francetti L, Taschieri S, Weinstein R. Systematic review of survival rates for immediately loaded dental implants. Int J Periodontics Restorative Dent. 2006;26(3):249–63.
7. Ono Y, Navins M, Capetta M. The need for keratinized tissue for implants. In Nevins M, Mellonig JT, editors: Implant therapy, Chicago, Quintessence. 1998;2009.
8. Tarnow DP, Magner AW, Fletcher P. The effect of the distance from the contact point to the crest of bone on the presence or absence of the interproximal dental papilla. J Periodontol. 1992;63(12):995–6.
9. Schropp L, Wenzel A, Kostopoulos L, Karring T. Bone healing and soft tissue contour changes following single-tooth extraction: A clinical and radiographic 12-month prospective study. Int J Periodontics Restorative Dent. 2003;23(4):313–23.
10. Waasdorp JA, Evian CI, Mandracchia M. Immediate placement of implants into infected sites: A systematic review of the literature. J Periodontol. 2010;81(6):801–8.
11. Siegenthaler DW, Jung RE, Holderegger C, Roos M, Hämmerle CHF. Replacement of teeth exhibiting periapical pathology by immediate implants: A prospective, controlled clinical trial. Clin Oral Implants Res. 2007;18(6):727–37.
12. Truninger TC, Philipp AO, Siegenthaler DW, Roos M, Hämmerle CH, Jung RE. A prospective, controlled clinical trial evaluating the clinical and radiological outcome after 3 years of immediately placed implants in sockets exhibiting periapical pathology. Clin Oral Implants Res. 2011;22:20–7.
13. Sclar AG. Ridge preservation for optimum esthetics and function: The bio-col technique. Postgraduate Dent. 1999; 6(1):1-11.
14. Zetu L, Wang HL. Management of inter-dental/inter-implant papilla. J Clin Periodontol. 2005;32(7):831–9.
15. Jemt T. Restoring the gingival contour by means of provisional resin crowns after single – implant treatment. International Journal of Periodontics Restorative Dentistry. 1999;19:21-29.
16. Jemt T, Lekholm U. Measurements of buccal tissue volumes at single –implant restoration after local bone grafting in maxillas: A 3-year clinical prospective study case series. Clinical Implant Dental Relations Research. 2003;5:63-70.

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