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Case Report

Screw Retained Prosthesis with Gingival Remodelling-A Key in Anterior Aesthetic Zone

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Abstract

Bone resorption following maxillary anterior tooth extraction is common and often compromises gingival tissue levels for the implant restoration. The loss of gingival volume is a major challenge for dental surgeons to plan implant-supported fixed prosthesis in such cases. particularly from an aesthetics perspective. The creation of predictable peri-implant aesthetics requires proper understanding and preservation of the osseous and gingival tissue surrounding the failing tooth. Gingival tissue remodeling can help in papillae formation to avoid soft tissue surgery by re-establishing the appropriate shape and gingival contour of the tissues. This improves not only the aesthetics, but also the phonetics of the patient.

The present paper describes a clinical case of gingival conditioning obtained with implant-supported fixed partial dentures. The purpose of the gingival conditioning was to obtain improved aesthetics. Gingival conditioning by application of pressure from the convex surface of the pontic of a screw retained fixed implant prosthesis, is presented as an easy, non-traumatic technique that improves gingival aesthetics.

Keywords: Screw Retained Fixed Implant Prosthesis; Gingival Remodeling; Convex

Introduction

Achieving optimal gingival aesthetics around dental implants in the anterior maxilla is a challenging procedure and maintaining it over time can be an equally demanding task [1]. Gingival recession around the anterior implant is reported around 16%.

The primary objective of traditional implant therapy was to ensure osseointegration and proper function [2]. In the traditional implant therapy after removal of non-restorable tooth, waiting for at least 3 months and then sequential osteotomy is done to place implant with another three to four months of waiting period, so this approach is time consuming and the other major disadvantage is that during healing face of bone there is accelerated bone loss, leading to aesthetic complication specially in maxillary anterior teeth. There are a variety of hard and soft tissue ridge augmentations that can be used to deal with the requirements.

In aesthetic zone various radical modifications to this original protocol had been introduced that showed promising and predictable outcomes, out of these modifications one is the placement of implants into fresh extraction sockets that is known as immediate implant placement [3].

In immediate implant placement procedure implant is placed immediately following tooth extraction in the same surgical procedure [3], There are several advantages of immediate implant placement technique such as preservation of bone and soft tissue, reduced number of surgical procedures, decreased total treatment time, reduced overall cost, and better patient acceptance.

In present scenario there is increased demand for harmony between the peri-implant gingiva and adjacent dentition. With the help of Gingival tissue remodelling, appropriate shape and contour of gingival tissue can be re-established without soft tissue surgery. It gives improvement in aesthetics as well as the phonetics of the patient. In this case report the gingival contouring was obtained with implant supported screw retained prosthesis.

Clinical Report

A 23-year-old female patient reported with the aesthetic concern due to missing anterior maxillary teeth. Clinically there were missing central incisor, lateral incisor bilaterally. On radiographic examination root stump in left maxillary lateral incisor region and proper healing was revealed in remaining edentulous ridge region. It was a type -2 extraction socket where alveolar bone and soft tissue was present on both labial as well as palatal side of root [4].

The patient was informed about her restorative options, i.e., removable partial denture, fixed dental prosthesis and fixed implant restoration. Patient chose fixed implant restoration over removable prosthesis to avoid preparation of existing adjacent teeth. Also, patient was informed about potential modification to the gingival architecture to ensure clarity of definitive peri-implant results.

Pre surgical procedure

A primary impression was taken with irreversible hydrocolloid (Dentsply 450g Zelgan 2002 Alginate), and diagnostic casts were fabricated with type III dental stone (kalstone dental stone class iii). Provisional partial denture was fabricated which was also used as diagnostic as well as surgical stent during implant placement, also preoperative cone beam computed tomogram (CBCT) was advised. (Figure 1a,1b,1c) Implant (Bioner Espigolera,9 Sant Just Desvern Barcelona,Spain) of specific length (4 X 13mm) were selected by radiographic examination.

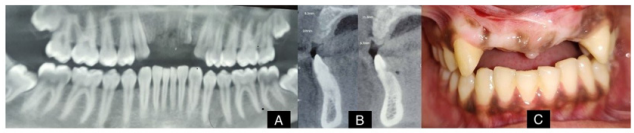

Figure 1

Surgical procedure

After having informed consent, surgical procedure was commenced, for the present clinical condition key implant position of bilaterally lateral incisor were selected. Right side implant placement was planned for without flap implant placement and the left one with flap implant placement. procedure was performed under local anesthesia (2% Xylocaine hydrochloride with 1:20,0000 adrenaline). Right side of implant was placed first using the sequential osteotomy (Figure 2a,2b), then mucoperiosteal flap was reflected and atraumatic extraction was performed with periotome and then drilling procedure was initiated with the pilot drill. Sequential drilling was carried out and left lateral incisor implant was placed. Both the implants were placed 3-4mm apical to predetermined free gingival margin to get proper emergence profile of final prosthesis. A distance of 1.5mm was maintained between the implant and adjacent tooth, Implants placed were BIONER TOP DM, Barcelona Spain. After placement of cover screw suturing was done with interrupted technique. For the confirmation of final implant position postoperative radiographs was taken immediately after surgery and kept as a baseline record. Postoperative regimen of amoxicillin 500mg every 8hrs, and 0.2% chlorhexidine oral rinse was advised. Following one-week and one month of follow-up, patient was referred for prosthodontic restoration after 3 to 6 months of healing.

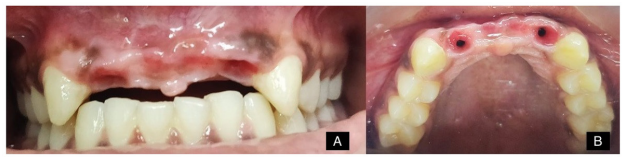

Figure 2

Definitive restoration

Gingival complex was completely maintained approximately 4 months following osseointegration. A healing cap was placed for 15 days, after 15 days soft tissue was evaluated for healing and abutment level impression was made for verification jig fabrication. A verification jig was tried and an open tray impression was made after the jig trial (Figure 3a,3b) Customised abutments were fabricated and screw retained prosthesis was fabricated. For gingival emergence profile a convex pontic design was selected. Initially mucosa in contact with prosthesis was ischemic without pain due to pressure which subsides gradually and it helped in achieving gingival scalloping (Figure 4a, 4b). For final gingival profile patient was recalled after 15 days of placement of the definitive prosthesis (Figure 5a,5b).

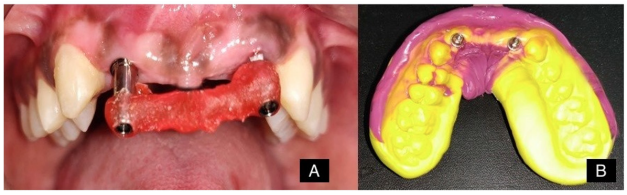

Figure 3

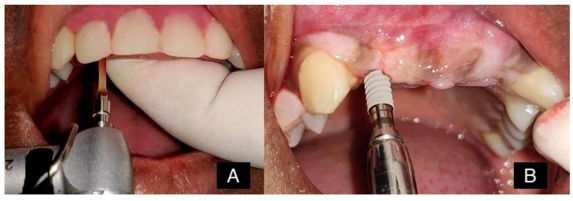

Figure 4

Figure 5

Discussion

As stated by prof. PI Branemark restoration should be planned 4-6 month after implant placement. Compared to other loading protocols conventional loading protocol is a predictable and an accepted treatment modality. In this case report, to get good treatment outcome we have used delayed loading protocol as per the clinical condition and available bone. Several advantages of present study were including biological advantages in maintaining tissue, aesthetic advantages by maintaining natural like appearance, preservation of the natural dentition and supporting periodontium, improved hygiene accessibility, and less long-term costs [7].

Romanos., *et al*. studied the survival rate of immediate versus delayed loaded implants and stated that although immediate loading of oral implants is a beneficial treatment protocol which increases the comfort of the patient but the clinical outcome and the peri-implant bone response of immediately loaded (IL) implants is poor in comparison to conventional loading protocol [8].

According to reports, immediate loading (IL) may be unpredictable in cases with poor bone quality [9] so we chose delayed loading as there were labial bone loss in present case due to trauma. Delayed loading ensures the implant stabilisation during early stages of bone healing.

Peri-implant aesthetics in maxillary anterior region having paramount importance and replacing a maxillary central incisor with an implant becomes extremely challenging in patients with thin gingival biotype (Class IV) [10,11].

A backward-driven treatment planning process including the determination of prosthetic and surgical risk factors is important for predictable and stable long-term outcomes [11]. Proper diagnosis and understanding of biology of factors related to soft and hard tissue in the edentulous region and their response to surgical and prosthodontic procedure are the essence of predictability [2]. In the aesthetic zone, the proper emergence profile of the provisional restorations provides the best approach to sculpting the peri-implant soft tissue. The final prosthesis must follow the ideal soft-tissue contours established with provisional restorations.

Screw retained FDPs have the advantage of more predictable retrievability. They require a minimal amount of interocclusal

space (min. 4 mm) (9) and are easier to remove when hygiene maintenance, repairs or surgical interventions are required. screw retained FDPs have the advantage of more predictable retrievability. We have given screw retained prosthesis in given case which allows easy retrievability and eliminates the need for cementation and possible soft tissue irritation, especially in sub-gingival sites. The advantage of using screw retention is elimination of the rough surface created at the crown abutment junction by providing a highly polished surface which facilitates tissue healing.

Summary

A key objective after maxillary anterior tooth extraction is preservation, of the existing soft and hard tissue contours, Gingival conditioning by screw retained implant prosthesis with convex pontics was presented as an easy, nontraumatic technique that can improve soft tissue aesthetics around implant-supported fixed prosthesis. Treatment success depends on the pre-existing gingival volume, the response of the gingival tissue of each patient (which is unpredictable), and patient compliance during treatment.

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