Case report

CREATION AND PRESERVATION OF SOFT TISSUE PROFILE AROUND DENTAL IMPLANT SUPPORTED RESTORATION IN ESTHETIC ZONE

ABSTRACT-

Despite successful osseointegration of dental implants, it does not ensure patient satisfaction. Patients can be dissatisfied with the definitive restoration because of a poor esthetic result. An esthetic implant restoration depends on correct implant placement and a well-designed & fabricated prosthesis that includes the prosthetic teeth and the surrounding whether it is acrylic resin or soft tissue. This article present a conservative treatment approach for replacement of missing tooth in esthetic zone with implant supported restoration and providing natural soft tissue profile around dental implant.

Keywords: anterior esthetic implant; emergence profile; customized prosthetic components; immediate non function loading.

INTRODUCTION

Implant therapy is becoming important in surgical dental practice and one of the major objectives of implant placement is considered the successful esthetic outcome. Considering success as a goal, patient's expectations play a crucial role concerning aesthetic outcomes. Soft tissue health and esthetics are critical to patient's perception and this is the most

challenging task for clinician for successful restoration. Implant position, abutment selection and final restoration are important parameters for a successful long term results of implant therapy. Due to multiple surgical procedures soft tissue contours are often compromised and it affects the esthetic of final restoration. Balance and symmetry of gingival margin and emergence profile of restoration are imperative for esthetic results. The emergence profile around dental implant should mimic the adjacent natural tooth.

Stein and Kuwata[1] in 1977 coined the term “emergence profile” which describe tooth and crown contours as they traversed soft tissue and rise towards the contact area interproximally and height of contour bucally and lingually. The soft tissue contours created during the provisional restoration must be preserved on the definitive model to have an accurate communication with the laboratory. Direct and indirect techniques are used to create the emergence profile. Indirect techniques use the fabrication of custom impression copings, whereas direct techniques use the interim restoration or an in situ registration of the surrounding tissues.

The aim of the present clinical report is to create emergence profile by transferring the soft tissue contour from provisional to the final restoration and fabrication of final implant restoration with predictable esthetic results.

CLINICAL REPORT -

A 25 years old non-smoker, male patient presented at out patient department, department of prosthodontics Subharti Dental College & Hospital with the chief complaint of missing teeth in upper front region since 4 years. On intraoral examination it was found that maxillary right central incisor was missing due to history of trauma and mesiodistal

width reduced to 4 mm due to drifting of abutment tooth. Patient was apparently healthy with no medical history. Patient was explained about different treatment options. As patient was willing for fixed implant supported restoration so orthodontic tooth movement was planned to gain optimum space upto 8mm before implant placement. Patient was explained about the treatment plan before starting the procedure. A written informed consent was obtained from the patient and referred to the department of orthodontics to provide an optimum space between right lateral incisor and left central incisor for prosthetically driven implantation. Patient's gingiva was thick biotype which is suitable for creating emergence profile around dental implant.

After 8 months of completion of orthodontic treatment and obtaining sufficient space, implant surgery was planned. Cone beam computed tomography was obtained to select the implant sizes (fig 1). Routine blood investigations were performed and all the parameters fell under normal limits. Local anaesthetic solution was administered using lignocaine 2% (1:80,000) and full thickness mucoperiosteal flap was reflected. Osteotomy was prepared using physiodispenser (NSK Nakanishi Inc. Tochigi japan) with sequential drilling and pilot drill angulation was checked to ensure final implant positioning (fig 2). 3.75 X 11.5 mm diameter (Alpha-bio SPI Dental Implant System, Israel) was placed and then stability of implant was checked using osstell devise. The implant stability quotient value was 62 therefore immediate non-functional loading was planned. A provisional screw retained acrylic crown was prepared on straight titanium abutment and screwed on implant, flap was sutured using Vicryl 4-0 non resorbable interrupted sutures (fig 3). Post operatively patients asked to take antibiotic amoxicillin & clavulanic acid 625mg thrice daily for 5 days. Analgesic Diclofenac sodium twice daily for 5 days. Patients was also asked to perform routine oral hygiene and advised to rinse with chlorhexidine gluconate for a period of 15 days.

Patient was recalled after 2 weeks of surgery and sutures were removed and patient was advised to maintain the oral hygiene. After 1 month of surgery, orthodontic braces removed and provision acrylic crown was relined by 3M ESPE light cured micro-filled composite to push the gingiva and to create the emergence profile (fig 4). Relining was done extra orally in which composite material was added on cervical 3rd of provisional crown to create the emergence profile closest to adjacent natural tooth.

After 3 month of surgery, gingival contour became scalloped (fig 5) due to pressure on soft peri-implant tissue. Crown was removed with abutment and placed in implant analogue. A putty index was made, later impression coping was placed in implant analogue. Then light cured composite material added in space between implant analogue and impression coping on the putty index (fig 6) and later customized impression coping was placed in patient's mouth (fig 7) and closed tray implant impression was made. Final implant restoration was fabricated on final cast and delivered according to the design made with the provisional restoration (fig 8). Postoperative Orthopantomogram was obtained (fig 9) Follow up was done for 12 months after definitive prosthesis.

DISCUSSON-

In 1990, a photographic analysis of natural teeth by Croll[2], confirmed that most emergence profiles are relatively straight as opposed to convex or concave. Improperly contoured emergence profile may accumulate plaque and are difficult to maintain their hygiene. Accordingly, properly contoured restoration with a natural emergence profile and gingival architecture that harmonizes with adjacent teeth is very important for aesthetic and functional implant therapy.[3] Neale and Chee[4] in 1994 were perhaps the first to describe a technique for surgically sculpting soft tissue around an implant to more closely mimic nature.

More recent published technique describes modifying provisional crowns incrementally rather than a surgical approach.[5] Aesthetic result of implant restorations depends on prosthetically and biologically driven implant placement, visually satisfying restoration and architecture of the surrounding peri-implant soft tissue.[6-9]

In the present case report emergence profile was created and transferred to the final restoration via indirect or extraoral method to minimize errors. This dynamic compression technique in the aesthetic zone is a clinical method based on the initial pressure and subsequent modification of provisional restoration by adding composite material to mimic the natural tooth contours. The dynamic compression technique described in this article differs from other techniques in that it reduces gingival trauma by eliminating the intraoral use of resin monomer and minimizing surgical procedures. There is no chemical or thermal insult to the tissues. By using properly contoured provisional restorations and taking advantage of the elastic nature of the gingiva, the need for additional surgeries may be reduced.

The described indirect technique will permit the dental laboratory to fabricate a customized definitive crown with optimum margin location relative to the patient's newly formed gingival margin. This will allow the crown margin and contours to fit as planned, and to support the custom-formed gingival contours for superior esthetic results.

The transfer of information to the laboratory is critical to achieve a successful esthetic outcome. Previous authors have described a technique whereby a final impression is made of the customized interim restoration itself, which is then placed back into the impression together with the implant analog before pouring the working cast[11] A major disadvantage of

this procedure is that the patient has to wait to receive the interim restoration after the cast is separated from the impression. In the described technique, however, the patient receives the interim restoration immediately, eliminating chair time, because most procedures are done in the laboratory. A further advantage of this technique is that direct tissue contact with resin while being added for sulcus modification is minimized, because the modified interim crown is only screwed in after being completely polymerized and polished extra orally.

Another technique describe by schlar known as “The Bio-Col Technique[11]. In this technique atraumatic extraction followed by socket grafting and placement of an ovate pontic to preserve gingival architecture. In his original technique he recommended: atraumatic extraction, perforation of the socket wall to create a bleeding surface, condensation of deproteinized bovine bone xenograft (Bio-Oss%) filled to the osseous crest, placement of a collagen matrix material (CollaPlug) over the graft, horizontal mattress suture over the extraction site, in order to retain the graft and collagen matrix, cyanoacrylate (Iso-Dent) placed over the suture and collagen to harden the material and decrease permeability of this barrier, and placement of an ovate pontic into the surgery site.

CONCLUSION-

This case report aimed to restore the complicated case of anterior maxillary implant where aesthetic is of major concern. A successful emergence profile was created, preserved, transferred, and maintained in the long term with excellent aesthetic clinical outcomes.

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FIGURES

Fig 1. Pre-operative OPG

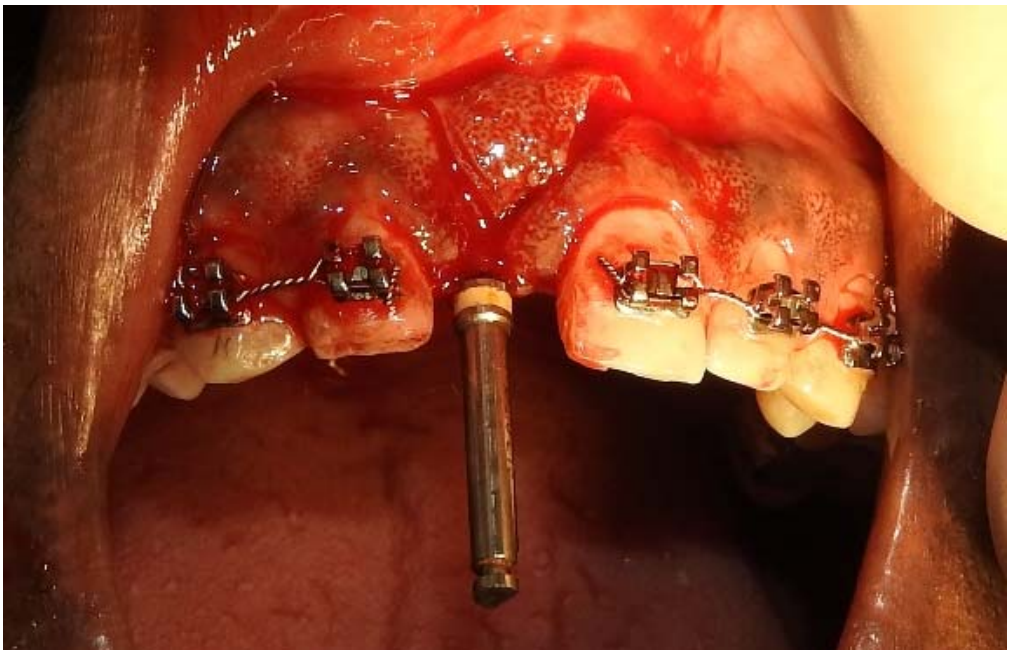

Fig 2. Osteotomy site prepared and angulation checked to ensure final implant position.

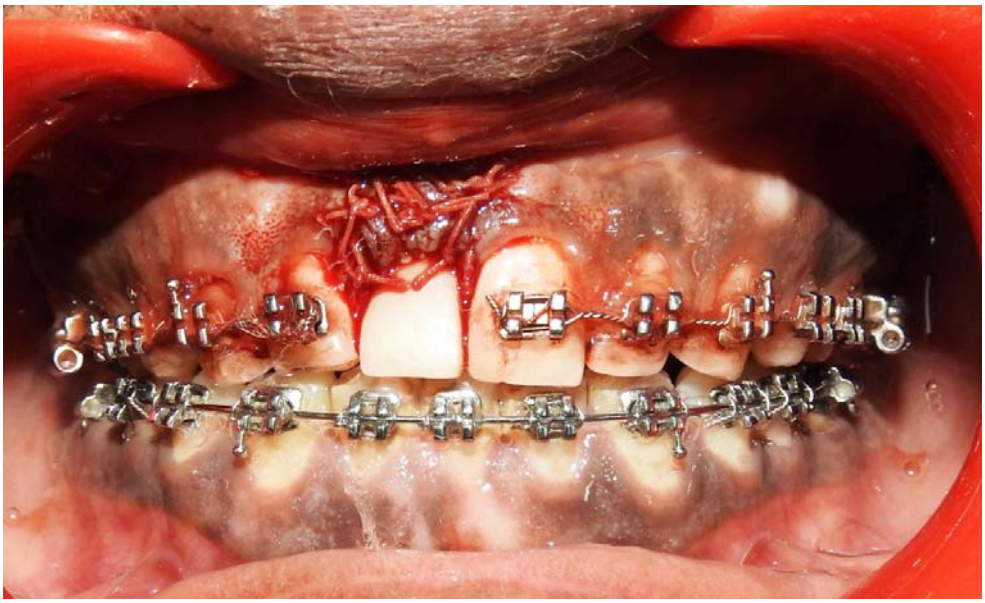

Fig 3. Immediate non functional loading with provisional acrylic crown

Fig 4. One month post-operative clinical view

Fig 5. Creation of planned soft tissue esthetic emergence profile

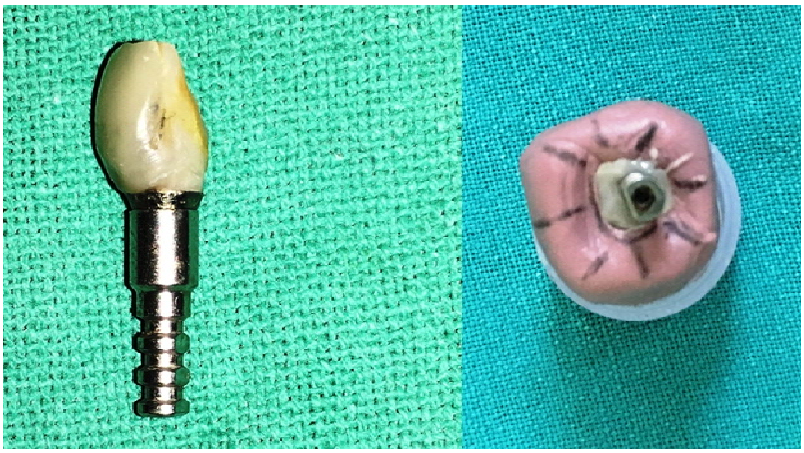

Fig 6. a. The provisional restoration connected to an implant analog.

b. filing the discrepancy with acrylic resin.

Fig 7 The customized impression post.

Fig 8. The ceramic restoration after cementation.

Fig 9. Post operative OPG