

1 **Case report**

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

5

6 **ABSTRACT-**

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

14

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

17

18 **INTRODUCTION**

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

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

29 Stein and Kuwata¹ in 1977 coined the term “emergence profile” which describe tooth and
30 crown contours as they traversed soft tissue and rise towards the contact area interproximally
31 and height of contour buccally and lingually. The soft tissue contours created during the
32 provisional restoration must be preserved on the definitive model to have an accurate
33 communication with the laboratory. Direct and indirect techniques are used to create the
34 emergence profile. Indirect techniques use the fabrication of custom impression copings,
35 whereas direct techniques use the interim restoration or an in situ registration of the
36 surrounding tissues.

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

41

42 **CLINICAL REPORT -**

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

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

56 After 8 months of completion of orthodontic treatment and obtaining sufficient space,
57 implant surgery was planned. CBCT was obtained to select the implant sizes (fig 1). Routine
58 blood investigations were performed and all the parameters fell under normal limits. Local
59 anaesthetic solution was administered using lignocaine 2% (1:80,000) and full thickness
60 mucoperiosteal flap was reflected. Osteotomy was prepared (using physiodispenser Aseptico)
61 with sequential drilling and pilot drill angulation was checked to ensure final implant
62 positioning (fig 2). 3.75 X 11.5 mm diameter (Alpha-bio SPI Dental Implant System, Israel)
63 was placed and then stability of implant was checked using ostell devise (fig 3). The implant
64 stability quotient value was 62 therefore immediate non-functional loading was planned. A
65 provisional screw retained acrylic crown was prepared on straight stock abutment and
66 screwed on implant, flap was sutured using Vicryl 4-0 non resorbable interrupted sutures (fig
67 4). Post operatively patients asked to take antibiotic amoxicillin & clavulanic acid 625mg thrice
68 daily for 5 days. Analgesic Diclofenac sodium twice daily for 5 days. Patients was also asked
69 to perform routine oral hygiene and advised to rinse with chlorhexidine gluconate for a period
70 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 5). 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 6) 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 7) and later customized impression coping was placed in patient's mouth(fig 8) 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 9). Postoperative OPG was obtained (fig 10) Follow up was done for 12 months after definitive prosthesis.

DISCUSSION-

In 1990, a photographic analysis of natural teeth by Croll, confirmed that most emergence profiles are relatively straight as opposed to convex or concave.² 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 in 1994 were perhaps the first to describe a technique for surgically sculpting soft tissue around an implant to more closely mimic

95 nature.⁴ More recent published technique describes modifying provisional crowns
96 incrementally rather than a surgical approach.⁵ Aesthetic result of implant restorations
97 depends on prosthetically and biologically driven implant placement, visually satisfying
98 restoration and architecture of the surrounding peri-implant soft tissue.⁶⁻⁹

99

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

109

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

114

115 The transfer of information to the laboratory is critical to achieve a successful esthetic
116 outcome. Previous authors have described a technique whereby a final impression is made of
117 the customized interim restoration itself, which is then placed back into the impression
118 together with the implant analog before pouring the working cast¹¹ A major disadvantage of

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

125 OTHER TECHNIQUE

126 “The Bio-Col Technique¹¹. by Schlar

127 In this technique schlar presented the concept of atraumatic extraction followed by socket
128 grafting and placement of an ovate pontic to preserve gingival architecture. In his original
129 technique he recommended: atraumatic extraction, perforation of the socket wall to create a
130 bleeding surface, condensation of deproteinized bovine bone xenograft (Bio-Oss%) filled to
131 the osseous crest, placement of a collagen matrix material (CollaPlug) over the graft,
132 horizontal mattress suture over the extraction site, in order to retain the graft and collagen
133 matrix, cyanoacrylate (Iso-Dent) placed over the suture and collagen to harden the material
134 and decrease permeability of this barrier, and placement of an ovate pontic into the surgery
135 site.

137 CONCLUSION-

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

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143 **REFERENCES-**

- 144 1. Stein RS, Kuwata M. A dentist and a dental technologist analyze current ceramo-
145 metal procedures. *Dent Clin North Am.* 1977; 21:729-749.
- 146 2. Croll BM. Emergence profiles in natural tooth contour. Part II: Clinical
147 considerations. *J Prosthet Dent.* 1990; 63:374-379.
- 148 3. Wöhrle PS. Nobel perfect esthetic scalloped implant: rationale for a new design. *Clin*
149 *Implant Dent Relat Res.* 2003; 5(Suppl 1):64-73.
- 150 4. Neale D, Chee WW. Development of implant soft tissue emergence profile: a
151 technique. *J Prosthet Dent.* 1994; 71:364-368
- 152 5. Wittneben JG, Buser D, Belser UC, Braegger U. Peri implant soft tissue conditioning
153 with provisional restorations in the esthetic zone: the dynamic compression technique.
154 *Int J periodontics Restorative Dent.* 2013; 33:447-455.
- 155 6. Brugnami F, Caleffi C. Prosthetically driven implant placement. How to achieve the
156 appropriate implant site development. *Keio J Med.* 2005; 54:172-178.
- 157 7. Cooper LF. Objective criteria: guiding and evaluating dental implant esthetics. *J*
158 *EsthetRestor Dent.* 2008; 20:195-205.
- 159 8. Buser D, Wittneben J, Bornstein MM, Grutter L, Chappuis V, Belser UC. Stability of
160 contour augmentation and esthetic outcomes of implant-supported single crowns in
161 the esthetic zone: 3-year results of a prospective study with early implant placement
162 postextraction. *J Periodontol.* 2011; 82:342-349.
- 163 9. Hermann JS, Buser D, Schenk RK, Higginbottom FL, Cochran DL. Biologic width
164 around titanium implants. A physiologically formed and stable dimension over time.
165 *Clin Oral Implants Res.* 2000; 11:1-11.

10. Phillips K, Kois JC: Aesthetic peri-implant site development: the restorative connection. Dent Clin North Am 1998;42:57-70

11. Fowler EB , Whicker R. Modified Approach to the Bio-Col Ridge Preservation Technique: A Case Report . J Contemp Dent Pract 2004 August;(5)3:082-096.

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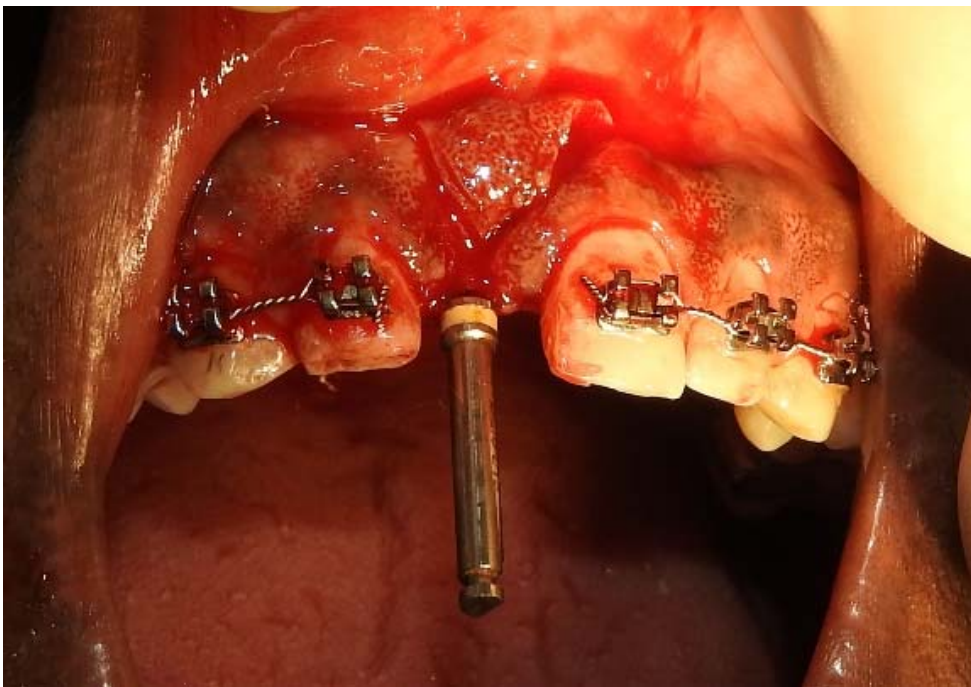
Fig 10. Post operative OPG

FIGURES



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

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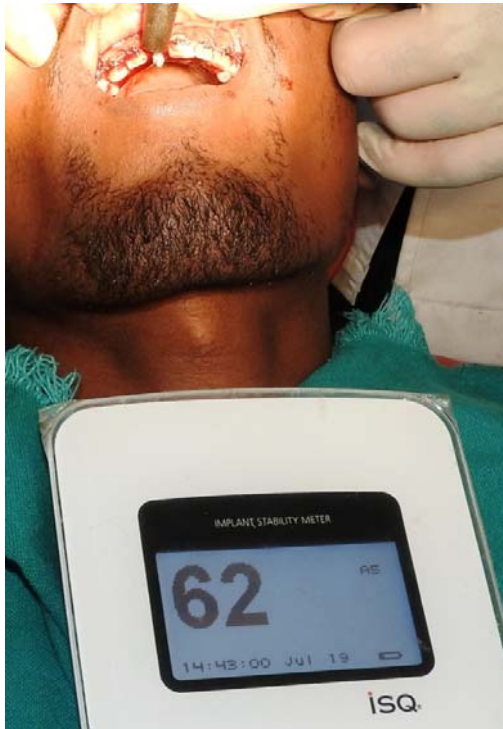


Fig 3. The implant stability quotient value



Fig 4. Immediate non functional loading with provisional acrylic crown



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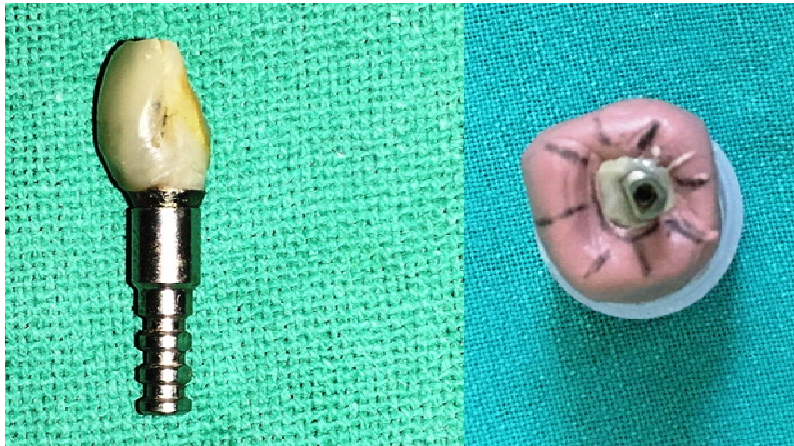
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