

Tissue sculpting: A journey from Start to Finish

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ABSTRACT

Background: Implants are ordinarily used by dentists around the globe to restore missing teeth, from a single missing incisor to fully edentulous arch. Retaining and stabilizing the prosthesis, restoring function were considered as primary goals of implant restorations as implant placement was guided by the site of available bone, but with increasing aesthetic demands and emergence of highly predictable GBR and GTR techniques there has been a paradigm shift from bone driven implant placement to prosthetically driven implant placement. Mimicking the emergence profile of the natural dentition, maintenance of a harmonious soft and hard tissue architecture, and blending of the final implant restoration with adjacent teeth are among the challenges faced by the dentist while replacing a single missing tooth in the aesthetic zone. Placement of a dental implant in aesthetic zone is a highly technique sensitive procedure with slight room for error. A minute mistake in the positioning of the implant or mishandling the soft or hard tissue can lead to aesthetic failure and patient dissatisfaction.

Keywords: Provisional, implant, abutment, prosthetic, immediate, customized.

INTRODUCTION

The emergence profile is a significant factor in achieving ideal hard and soft tissue profile. Immediate implant provisional restorations have proven to play a pivotal role in achieving the ideal emergence profile that is in harmony with surrounding tissues. Many techniques have been described to maximize the appearance of the tissues around implants using provisional restoration, one such technique is described in this article.

CASE PRESENTATION

A 22-year-old male patient reported to the department of prosthodontics with the chief complaint of missing lateral incisor and a peg lateral on the contralateral side of the arch (fig 1), and requested replacement of the missing tooth as well as restoration of his smile. Considering the age of the patient, an implant with an E-max crown was decided for the missing lateral and a comprehensive single Emax crown for the peg lateral.

Diagnosis and treatment planning:

Patients diagnostic cast were made and were mounted in existing MIP and full contour esthetic wax up was done (fig 2), for analysing patients' occlusion and for the amount of space available for implant restoration. For deciding the dimensions of implant to be used and for selection of the type of implant prosthesis CBCT of the upper arch was done. After detailed analysis of the available aids an alpha bio implant of 3.5×11.5 mm was selected for a cement retained prosthesis. Considering patients favourable occlusion, absence of parafunctional habits and presence of good oral hygiene immediate provisional restoration of the implant was decided for tissue sculpting around the crown before final restoration. An Emax crown for the peg lateral was selected as it exhibited adequate enamel for bonding as well as favourable crown to root ratio.

Surgical phase:

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Fig 1: Pre-operative extraoral and intra oral pictures.



Fig 2: Diagnostic wax up.



Fig 3: a. Flap reflection b. Vacuum form template showing final drill angulation.

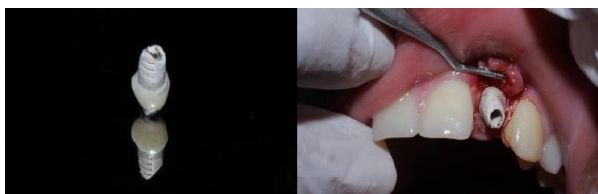


Fig 4: a. Free hand composite build up. b. trial in the mouth. c. radiographic assessment of modified peek abutment. d. temporary crown fabricated.



Fig 5: a. blocking out with piece of glove. b. creating a butt joint on the crown margin.



Fig 6: a. Modified peek abutment with lab analog b. raising the platform by adding composite. c. modified abutment and crown. d. crown cemented in the patients mouth.



Fig 7: Gingival profile achieved.



Fig 8: a. duplicating the gingival profile in putty. b. index of gingival profile. c. orienting the impression post in the index. d. modifying the impression post.

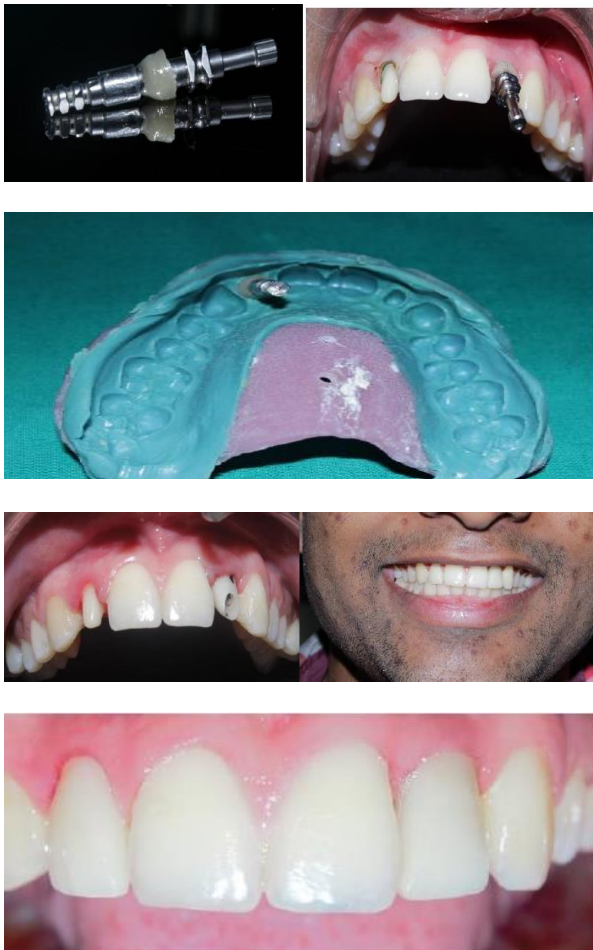


Fig 9: a. Modified impression post. b. modified impression post oriented in patients mouth. c. Final impression. d. Customised zirconia abutment. e. final e max crown. f. Modified impression post. (b) modified impression post oriented in patients mouth.

A 3.5×11.5 mm alpha bio implant was placed following standard surgical protocol (fig 3). After placement of the implant a cement retained provisional restoration was fabricated immediately and the flap repositioned back in place.

Provisional restoration:

For immediate provisional restoration a peek abutment was seated and screwed on to the implant and prepared intra orally as per the planned occlusal esthetic wax up. The cervical part of the PEEK abutment below the gingival margin was arbitrarily modified by adding composite material free hand and the fitting was checked radiographically, this addition of material was done to help achieve a better emergence profile of the tooth. The modified PEEK abutment was tried in the patients mouth and a provisional crown fabricated using Bis- GMA composite resin material and silicone index of the wax up. After cementing the provisional crown and removal of excess cement, the flap was repositioned. (fig 4 a-d)

A new provisional crown was made after a weeks' time, after the inflammation had subsided and tissues had started taking shape according to the contour of the modified abutment. This new crown had a slight subgingival margin as compared to the previous crown for ease of removal of excess cement as well as for easy retrievability of the crown.

The screw access hole of the abutment was blocked and a small piece of latex glove was cut to fit around the abutment, petroleum jelly was applied to the abutment and a provisional crown was fabricated intra orally using silicone index of the wax up. After setting of the material the provisional crown along with the latex glove piece was removed, the cervical margin of the crown was trimmed extra orally to create a flat butt joint. The level of this butt joint was decided according to the desired level of gingival margin (fig 5).

Temporary PEEK abutment was removed from the patient's mouth and connected to a lab analog, new provisional crown made with a flat butt joint was placed on the assembly of abutment and analog, petroleum jelly was applied to the cervical margin of the crown, flowable composite material was used to modify the abutment by filling the space between

the abutment and the provisional crown. Petroleum jelly prevented composite from bonding with the provisional crown and ensured a slight subgingival margin which facilitated easy removal of excess cement and raised the platform of the temporary abutment. The modified PEEK abutment was torque wrenched at 20 NCm in patients mouth and the provisional crown was checked for proper proximal contacts, proper buccal & lingual contours (fig 6 a-d). occlusion of the crown was adjusted before cementing the crown in place. Periodic recall was done every 15 days to evaluate good tissue health around the provisional crown as well as to check the stability of the implant.

Restorative phase:

After 3 months of uninterrupted healing, the emergence profile created by the modified PEEK abutment and provisional crown (fig 7) had to be replicated in the final impression, for this the whole assembly of provisional crown, abutment and lab analog was immersed in a dough of putty placed on a glass slab, after the putty was set buccal surface reference was marked. A roughened impression post was tried in the patient's mouth, on which the buccal surface reference was marked which will help in orientation of the impression post into the putty index. The space between the impression post and the emergence contour recorded by the index was filled with flowable composite. (fig 8 a-d) An open tray impression was made using this modified impression post and sent to the laboratory for fabrication of custom zirconia abutment, on which Emax crown was fabricated for best esthetic results (fig 9 a-e)

DISCUSSION

The term "emergence profile" was first used in 1977 by Stein and Kuwata⁽¹⁾ to describe tooth and crown contours as they traversed soft tissue and rise toward the contact area interproximally and height of contour buccally and lingually. Achieving an ideal emergence profile is extremely difficult for the dentist restoring missing teeth in the esthetic zone, immediate provisionalization is one the methods of tissue contouring and achieving ideal emergence profile.⁽²⁾ Fabrication of an implant supported fixed provisional restoration can be carried out directly in the mouth or in the dental laboratory in a so-called indirect approach. The main advantage of the

direct approach includes reduced number of clinical and laboratory steps. The direct approach is also advantageous in cases of immediate provisionalization following implant surgery. The provisional can be either screw retained or cement retained, one of the main disadvantages of screw retained provisional restorations is need to camouflage the screw access hole often seen penetrating through the facial surface of the provisional crown, this poses a serious problem while restoring maxillary anterior region.⁽³⁾ Major concern with a cement retained provisional restoration is inability to remove excess cement which is detrimental to the peri implant tissues and the difficulty in retrieving the restoration.⁽⁴⁾ The technique mentioned above helps overcome both these problems , by raising the platform of the abutment the crown margins are slightly subgingival or equigingival which aid in easy removal of excess cement as well as easy retrievability when replacement or modification of the provisional restoration is required. After an optimal tissue contour is achieved with the help of provisional restoration, accurate transfer of this shape to the final restoration with standard implant impression post is difficult due to the cylindrical shape of the impression post.⁽⁵⁾ A modified impression post used in this technique helps in accurate and easy transfer of the acquired emergence profile and tissue contour.⁽⁶⁾

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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