



Emergence profile in anterior implant region by gingival recontouring – 2 year follow up

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General Note



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ABSTRACT

In spite of successful osseointegration of dental implants, many patients often are displeased with the outcome of the implant treatment due to the poor esthetics of the final restoration. For a proper esthetics of the implant restoration certain factors such as implant positioning, the nature of the hard tissue and texture of the soft tissue and emergence profile play an important role.

Emergence profile of the restoration is an integral part for developing a good esthetics and also for maintaining a good health of peri-implant soft tissue. This case report highlights the use of provisional implant restoration to create gingival recontouring.

Keywords: Provisional restoration, customised restoration, screw retained prostheses, gingiva.

1. INTRODUCTION

The problem of osseointegration of implant fixture body to the bone is no longer a concern in recent times; however establishing proper esthetic outcome of the final implant restoration is still a challenge (Steigmann et al., 2014). The advent of advanced radiographic techniques such as Cone Beam Computed Tomography (CBCT) has facilitated the immediate implant placement protocol. Precise placement of the implant combined with the good prostheses preserves the soft tissue design and also provides the optimal esthetic outcome (Noharet et al., 2019). With the recent development of bone grafting materials and procedures, concept called as Reverse Engineering - Restoration driven implant placement has emerged leading to a more demand in establishing a proper esthetic outcome with healthy peri implant tissue. Achieving an optimal emergence profile depends on the selection of the implant, healing abutment, and intermediate prosthetic element selection (Mee-Kyoung Son et al., 2011).

Moreover the clinical situation involving single implant in anterior maxilla, the surrounding soft tissue is very important and it plays a major part in esthetic outcomes (Dos Santos et al., 2019). Proper emergence profile is required for maintaining of hygiene, gingival health and appearance of the implant restoration (Ioannis Vergoullis et al., 2017). Stein and Kuwata were the first authors to define the term "emergence profile" in 1977, describing the tooth and crown contours relationship. With the recent development of dental implants, this concept of emergence profile has gained more importance. This was first stated by Neale and Chee in 1994 for dental implants. This technique involved the surgical sculpting of the soft tissue around an implant to resemble the anatomical nature. But recently, techniques modifying the provisional restoration are used rather than the surgical approach.

2. CASE REPORT

23 year old female patient reported with a complaint of missing tooth in relation to upper front tooth region due to trauma (Figure 1). Orthopantomogram and CBCT were advised and it revealed root fragment in relation to maxillary left central incisor tooth region. The CBCT data was analysed for the selection of the implant dimensions. The procedure was carried out in local anaesthesia (lignocaine with 2% adrenaline). Crestal (horizontal incision) and bilateral vertical releasing incisions extending at an angle obliquely were made exposing the labial bone (Gary Greenstein et al., 2014) the root fragment of maxillary left central incisor was extracted with a Periosteal Atraumatically. After the site was prepared, an implant of dimension 4.2 x 11.5 mm (SLA treated MIS Seven, Israel) was placed immediately. 1cc of bone graft material (NOVA BONE Dental Putty, USA) was injected around the implant and the flaps were approximated with resorbable sutures. An interim removable partial denture with no labial flange was given to the patient. After 6 months of healing, a closed tray implant impression was made (Kalamalla et al., 2020) and temporary titanium cylinder (MIS Temporary abutment, Israel) of 5mm was connected to the implant analogue and screw retained heat polymerized provisional implant restoration was made. The provisional restoration was made in a manner so that it replicated the buccal contours of the adjacent teeth. After the provisional restoration was fabricated, the soft tissue contours around the implant analogue in the cast was slightly trimmed to make the desired gingival morphology. The space between the provisional restoration and the trimmed soft tissue area in the cast was then filled with autopolymerising acrylic resin with the add-on technique (Figure 2). The provisional restoration was polished with polishing paste and rubber cups. The provisional restoration was torqued with help of hex driver and torque wrench giving a slight pressure to gingival tissues. A slight soft tissue blanching was seen around the implant due to increased circumference of the provisional restoration causing diminished blood supply but later it got diminished. Patient was asked to wear the provisional restoration for about 6 weeks, review of the restoration was done at every week and autopolymerising acrylic resin was added in each review around the gingival area of the restoration so that there is adequate gentle passive pressure always for better gingival contour. After 6 weeks the provisional restoration was removed and checked for the gingival recontouring, once the gingiva was stabilised, open tray impression was made by connecting the impression coping to the implant. A definitive cement retained implant restoration was fabricated and cemented (Figure 3). The patient was followed up for every six months till 2 years (follow up period – 2017 to 2019), proper oral hygiene was maintained with no gingival inflammation and no abutment screw loosening was noted.



Figure 1 Intra – oral picture

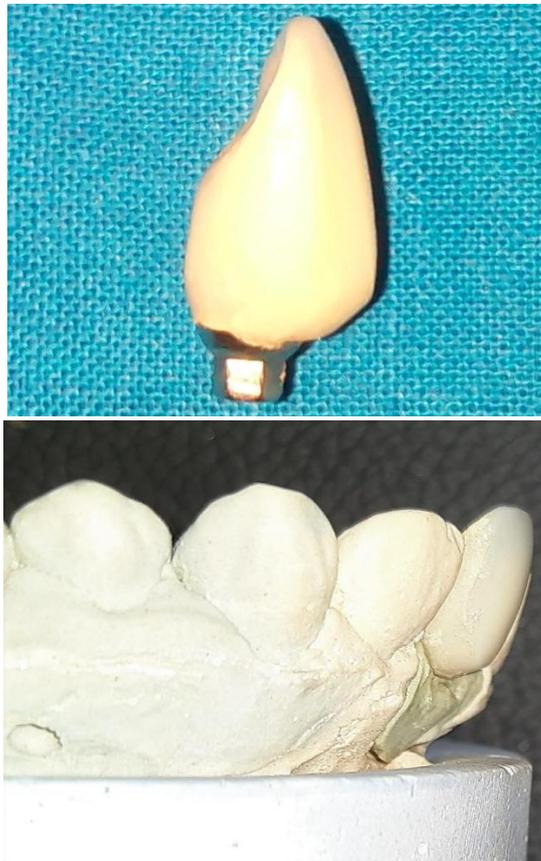


Figure 2 Screw retained provisional implant restoration and View of emergence profile in cast

3. DISCUSSION

Residual alveolar bone, peri-implant soft tissue, crown form, high smile line, tissue biotype, are the factors which determines the esthetics and health of implant restorations (Steigmann et al., 2014; Mee-Kyoung Son et al., 2011). The periodontal health around the implant is maintained by a good physiological crown form which directly induces the self-cleansing activity. To achieve a good physiological implant restoration form, ridge profile and submergence profile are needed to be considered (Mee-Kyoung Son et al., 2011). For a better emergence profile a three stage approach is planned with certain guidelines (Davarpanah et al., 2001).

Stage 1: surgical stage - use of a proper implant diameter and ideal implant position

Stage 2: intermediate abutment stage - proper selection of the healing abutment and the use of a provisional restoration

Stage 3: final prostheses stage – use of proper definitive crown with all the anatomical details, correct selection of shade choice and ceramic characterization (Dos Santos et al., 2019)



Figure 3 Emergence profile created by gingival recountouring and Definitive cement retained implant restoration in relation to maxillary left central incisor

The emergence profile of the implant was planned in the intermediate abutment stage. The intermediate abutment stage allows the clinician to fabricate a provisional restoration which aids in visualizing the final outcome of the definitive prostheses in terms of esthetics, speech and function. Screw retained provisional restoration was fabricated because it allows easy retrievability, and promotes the soft tissue healing around the implant since there is no rough abutment crown interface as seen in cement retained counterpart (Mee-Kyoung Son et al., 2011). The technique described here minimizes the risk of resin monomer usage intraorally and also reduces the gingival trauma by surgical procedures. Study has shown that only high concentrations of monomer resin cause significant damage to the soft tissue (Ioannis Papadopoulos et al., 2014). Capturing the internal soft tissue for the definitive impression is not critical in this technique because the provisional restoration aids in replicating the prostheses contours. In this technique, the labial surface of the provisional restoration was made more convex so that the gingival tissue moves in the apical direction. Sub-gingival interproximal acrylic contour was also made convex, to move the papilla incisally, thereby pushing the tissue towards the proximal surface of the adjacent tooth (Robert David, 2008).

According to the literature and observations gained from the case study, the technique has the following advantages and disadvantages. Advantages: (Davaranpanah et al., 2001; Ioannis Papadopoulos et al., 2014). By using customized provisional restoration, soft tissue manipulation is controlled optimizing a good esthetic outcome. Provisional restoration allows evaluating the esthetics and function. Laboratory made provisional restoration reduces the chair side adjustment procedure. It minimizes the injury to the soft tissue and promotes good oral hygiene due to its high polished surface quality. Disadvantages: (Ioannis Papadopoulos et al., 2014). Prolonged treatment time, patient has to be with the provisional restoration for 6 – 8 weeks for the soft tissue manipulation. There is tendency of soft tissue collapse for a short period if the provisional restoration is removed and left undisturbed

4. CONCLUSION

The method discussed, allows the preservation and manipulation of soft tissues even before fabricating a definitive restoration. This technique provides an improved patient satisfaction and also a good implant prognosis is gained. There are many methods available to develop an emergence profile in the literature, but the ultimate choice is given to the clinician to choose.

Author contribution

Syed Ershad Ahmed – Contributed To the Study Design, Doing the Case Study, Collecting the Information
S. Parithimar Kalaignan – Contributed To the Compilation of the Results, Formatting the Manuscript

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Conflict of Interest

The authors declare that they have no conflict of interest.

Informed consent

Written & Oral informed consent was obtained from patient included in the study.

Data and materials availability

All data associated with this study are present in the paper

Peer-review

External peer-review was done through double-blind method.

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