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Rohit Raghavan
Head of the Department,
Department of Prosthodontics,
Royal Dental College Chalissery,
Kerala, India

Shajahan PA
Professor, Department of
Prosthodontics, Royal dental
Collage; Chalissery, Kerala, India

Ambili Ravindran
Post Graduate Student,
Department of Prosthodontics,
Royal Dental College Chalissery,
Kerala, India

Corresponding Author:
Rohit Raghavan
Head of the Department,
Department of Prosthodontics,
Royal Dental Collage Chalissery,
Kerala, India

Esthetic emergence profile

Rohit Raghavan, Shajahan PA and Ambili Ravindran

Abstract

Rehabilitation of an edentulous arch with an implant supported prosthesis is a widely accepted treatment modality for the past two decades. Prosthetic rehabilitation in the anterior maxillary region is a challenging treatment modality because of reduced soft tissue and bone support. Creating an intact Interdental papilla and adequate soft tissue contour is mainly dependent upon the implant placement and careful use of provisional prosthesis which preserves the harmonious architecture of gingival and affect final result positively. This article describes a technique of implant restoration with an esthetic emergence profile with the help of customized provisional restoration.

Keywords: Esthetic emergence, customized provisional restoration

Introduction

The tedious process in implant dentistry is to full fill patient's esthetic expectations. Replacing a missing tooth in anterior region adjacent to a natural tooth with adequate Interdental papillae became a major restorative challenge. Adequate amount of hard and soft tissue should be there to create a good gingival contour which is in harmony with remaining tooth structure. A missing tooth in the anterior maxillary region can be replaced by various treatment modalities like fixed partial denture, removable partial denture and single tooth implant. In this implant is the newer advanced treatment modality. To determine the final treatment outcome we should evaluate the selection criteria like availability of the bone, prosthetic space, and periodontal status of surrounding soft tissue. Placement of implant in esthetic zone is a tricky procedure as the numerous esthetic challenges have to meet. Often it is not possible to place an implant in ideal position because of the lack of soft tissue and sufficient bone. A good emergence profile is mainly depended upon the techniques and materials used by the professional. This clinical report details a case of extraction with immediate implant placement. A good professional is used to achieve a good emergence profile for the final implant prosthesis.

Case report

Outline of the case

Diagnosis

A 35 year old male patient visited the department of prosthodontics for rehabilitation of fractured endodontically treated left maxillary central incisor. Clinical evaluation revealed that the left central incisor was fractured at the cervical region (Fig. 1). Past dental history revealed that left central incisor had undergone root canal treatment 4 years back due to caries, and one year back he had met with an accident which led to the fracture of the same. The Ortho Pantomograph (OPG) revealed sound bone and sufficient prosthetic space for placement of implant (fig. 2). Various treatment modalities like fixed prosthesis, removable prosthesis and a single implant retained prosthesis were discussed with the patient and rehabilitation of central incisor with a implant retained prosthesis were fixed.



Fig 1: Fractured tooth IRT 21 region



Fig 2: OPG sound bone and adequate prosthetic space for placing implant

Treatment Plan

A thorough case history, clinical examination and radiographic analysis was done and other necessary investigations, cost factor all were evaluated. An extraction with implant placement and immediate provisionalization was the treatment modality decided.

Procedure

Thorough oral prophylaxis was performed before any intervening procedure was carried out. Radiographic and other required investigation were carried out to rule out any systemic conditions. Strict infection control protocol was followed before the procedure to avoid contamination of implant placement site and the implant. The biggest challenge was to do an traumatic extraction of root canal treated tooth (left central incisor). extraction was done using a periosteal elevator. A provisional restoration was fabricated by creating a 2mm recess in the diagnostic cast, using acrylic teeth and composite.

Diagnostic cast measurement revealed that mesiodistal width of contra-lateral central incisor is 7mm, while the edentulous

space was 5mm, which was sufficient for implant placement. From the radiograph the length of the root was assessed by measuring the root length of contra-lateral central incisor. it was decided to place a implant of length 4.3 *13 mm. Implant (Nobel replace tapered RP) placement was performed in the extracted socket and healing abutment placed (fig 3). Patient was having SIEBERTS classification III, bone graft (Xenograft, Osseograft, Encoll, Fremont, CA, USA) and membrane (Healiguide, Encoll, Fremont, CA, USA) was placed. It is stabilized by the provisional restoration which fit into the extraction socket perfectly (fig.4). The provisional restoration is placed into the extraction socket without interfering the implant beneath it and it is stabilized by splinting to the adjacent tooth (fig 5). Pontic design chosen was ovate to form gingival cuff. The patient was recalled after 2 days. After evaluation no soft tissue inflammation found. Advice regarding proper oral hygiene measures was given. Follow up after 3 months revealed sharp, well formed Interdental papillae and ideal emergence profile was achieved (fig 6)



Fig 3: Extraction of root stump followed by implant placement



Fig 4: Bone graft and membrane was placed



Fig 5: The provisional restoration is stabilized by splinting on to the adjacent teeth



Fig 6: Follow up after 3 months

For making a definitive prosthesis an open tray impression is made (Fig.7). An aesthetically pleasing prosthesis is fabricated and tried in patients mouth. the emergence profile seems to be adequate. Blanching of soft tissue was no there. Cementation of final prosthesis (screw retained) was done. The patient is reviewed after 1 week and patient reported increased confidence level and better speech articulation. Patient was satisfied with the treatment outcome (fig 8).



Fig 7: Open tray impression



Fig 8: Final treatment outcome

Discussion

The emerge profile attained by a single implant supported prosthesis in anterior region plays a key role in maintaining oral hygiene, esthetics and peri implant health ^[11]. A successful restoration should have an emergence profile that mimics the natural tooth. The absence of Interdental papilla can affect this natural look.

According to Tarnow *et al.* ^[2] distances between contact point and crestal bone is very important in determining the presence of inter proximal papillae. He found out that if the distance was 5mm or less then the papillae was almost present. If the distance was 7mm or more papillae was usually missing. So the case selection should do accordingly.

Creating a natural looking emergence profile is a tedious process. A properly fabricated provisional restoration is the best option for creating a good profile and final definitive prosthesis that is fabricated should follow the contact and contour of the soft tissue profile.

This article has illustrated a simple technique for obtaining a good emergence profile using customized provisional restoration which is placed immediately after implant placement which is supported by splinting to the adjacent teeth.

Vaibhao I Shambharkar *et al.* ^[15] had established an emergence profile with help of an customized provisional restoration. After surgical procedure working cast marked 1mm wide around implant site and scraped to a depth of 1.5mm with round bur to fabricate a provisional restoration with protemp, this provisional will do the sequential molding of the gingival level.

Jospeh Y.K *et al.* He had created an ovate concavity of 2-3mm with in confines of the gingival architecture and featured a deep facial than gingival extension. A denture tooth which made to fit in prepared concavity. After lubricating working cast auto polymerizing acrylic resin is applied to concavity after that place this ovate pontic to fuse with that. Wrote wire clasp is incorporated in molar and premolar area, wax up is done. Pattern was inverted and processed by heat polymerizing acrylic resin and it is immediately place after implant surgery to create a good emergence profile.

Inaki Gamborina *et al.* ^[16] A provisional was made according to a diagnostic full contour wax up and a circular emergence profile was caved on the cast around the implant analogue to

provide an ideal tooth contour. The transfer coping served as provisional abutment and composite resin was added to fill the space between the carved stone and the coping. The abutment was prepared according to silicon matrices of wax up and provisional acrylic resin was fabricated. Crown is cemented to provisional abutment of implant. Patient is reviewed in 3 months of healing period and good tissue contour and improved tissue height is achieved.

Once we attain an emergence profile the next biggest challenge is the accurate transfer of the soft tissue profile to a working cast, so that the dental technician can transfer the emergence profile to the final prosthesis. As the impression coping is cylindrical in shape it is difficult to transfer the peri implant soft tissue contour to the cast. Several techniques have been reported for this they may be summarized as follows.

Nicolas *et al.* ^[11] fabricated a well contoured provisional crown to create an optimum soft tissue profile. The provisional crown and temporary abutment are connected to a laboratory analog. This provisional crown will act as a transfer coping for making emergence profile in the cast. a implant level impression is made which help the laboratory technician in developing emergence profile from implant platform to cervical third of clinical crown

Hinds *et al.* ^[3] fabricated a customized impression coping. After removing the provisional restoration from implant it is attached to a laboratory analog, then the assembly is placed in a impression material until it hit bottom so the cervical third of crown is recorded. the provisional is removed and then laboratory analog is connected to a impression coping, then it is customized using resin material.

Attard *et al.* ^[5] described a technique in which the provisional restoration is used as a impression coping for taking impression.

Conclusion

Dental aesthetics are all about striking the right harmony between the soft and hard tissue components. Health of peri implant hard and soft tissue and final implant restoration plan should be an integral part of overall treatment plan from the onset to ensure stable functional and esthetically pleasing result.

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