

Screw-Cement Retained Implant Prosthesis: A Case Report

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Abstract:

Dental implants now are considered to be the standard of care for single, partial and full arch teeth replacement. There are revolutionary changes with advances in implant structure, shape, size, methods of placement, instrumentation used and reduction in the time of total treatment. Number of implants and correct position of them can be determined only by proper treatment planning. Before placement of dental implant, bone availability, soft tissue condition, vital structure positions should be properly determined. The emergence profile, occlusal forces in relation to loading protocol and occlusal forces on the final restoration should also be kept in mind. The mode of attachment of prosthesis to implant is either a screw or cement retained. There are chances of screw loosening or leaching of the cement at the crown margins which will be more deleterious for the bone around the implant hence to gain the combined retentive benefits of each a screw cement retained prosthesis is advisable. This case report demonstrates the placement of implant in maxillary first molar region with a screw- cement retained prosthesis.

Keywords: Dental Implant, maxillary molar, missing molar replacement, Screw cement retained prosthesis. (SCRCP)

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I. Introduction

Due to the advancement in the dental science, replacement of the missing tooth has become easy. The option of fixed tooth prosthesis is fulfilled by placing the dental implants. These have gained acceptance as no adjacent tooth is compromised during or after placement. The prosthesis can be early or immediately loaded. The waiting window for the replaced tooth is reduced which has gained more popularity as a treatment option by the patients. Dental implants provide function, esthetics as well as restores the confidence of the patient.¹

The treatment comprises of surgical phase and prosthetic phase. In first / surgical phase implant is placed mimicking the root form of the tooth and later loading is done once the healing occurs that is the prosthetic phase. The different loading protocols are early, immediate, delayed and prolonged.²

To create an implant supported restoration that replicates a natural tooth has always been the aim of many dental professionals hence, replacing the missing tooth in anterior region with implants becomes challenging.^{3,4} Esthetic considerations have become the definition of success along with the function and long-term predictability.⁵ Esthetics does not pertain to just the restoration or replacement of anterior teeth but to all the teeth which are visible in the smile.

Implant placement in posterior maxilla is uniquely challenging due to few complicating factors⁶, some factors which cause difficulty in maxillary implant placement and its success are limited vision, access difficulty, reduced inter arch space, extensive tissue loss and sinus pneumatization by over the time post extraction resorption.^{7,8} Poor type 4 bone quality giving least favorable success.⁹ Survival rate of implant dentistry has become predictable due to the recent advancement in this field.¹ This case report highlights the implant placement in maxillary first molar region with conventional or delayed loading protocols using screw cement retained prosthesis.

II. Case report

A 24-year-old female patient reported to the department of Prosthodontics with the chief complaint of difficulty while chewing on the right side due to the missing tooth. She was conscious about the space visibility during smiling. The tooth had been extracted 3 months back as it was grossly destructed due to caries.

The patient was in good general health and had no significant medical history. In extraoral examination no temporomandibular disorder was present. Lip and cheek tonicity was normal. In intraoral examination the edentulous region was measured and it was suitable for adequate dimensions of molar. The adjacent teeth were

vital without any caries or restoration. Gingival and Periodontal condition was sound, overall oral hygiene was good. patient was given all the choices of tooth replacement as removable or fixed by tooth supported or implant supported prosthesis and was explained about the advantages and disadvantages of the same. Out of which she chose implant prosthesis as she was already aware of the significance and positives of this tooth replacement modality.

III. Treatment plan

Preoperative radiograph was taken which revealed significant bone height and width. Diagnostic impressions were made with alginate and impressions were poured in dental stone. Casts were mounted on the articulator. CBCT was performed which gave an exact idea of the operatory site and its surroundings. It showed edentulous space in the region of maxillary right central incisor with bone width of 7.3 mm and height of 13 mm. so the implant size of 5*10 mm was selected. Bone type in the area was of D3 type. Before the surgical procedure a written informed consent was obtained from the patient.

Surgical Procedure

Once the patient was seated on the operating chair, first extraoral then intraoral scrubbing was done. Surgical site was anesthetized by local administration of 2% lignocaine hydrochloride with 1:80000 adrenaline. When patients subjective and objective anesthesia was confirmed a midcrestal incision was made at the edentulous space (fig1). The mucoperiosteal flap was reflected (fig2). The bone width was 7.3 mm.

Initial drilling was done with lance drill after which positioning of angulation of drill site was verified by using a parallel pin. IOPA was taken while doing drilling. Sequential drilling was done till 5*10 mm [osstem].

An implant fixture [5*10 mm Osstem] was placed (fig 3) with an adequate torque of 30 Ncm. IOPA radiograph was taken immediately after the placement (fig 4) and cover screw was placed. Interrupted sutures were given for flap closure with the help of silk 3.0 sutures (fig 5).

Post operative care

Post operative medications were given. To promote wound healing and the patient was advised for warm saline gargles for initial 15 days. Post operative instructions were to avoid any undue stresses on the surgical site. After 15 days sutures were removed.

Second stage surgery

After a healing period of 4 months the patient was recalled. IOPA radiograph was taken to check the signs of osseointegration. In second stage cover screw was removed. [Osstem] healing abutment of size 5*5 mm was placed and verified for the fit by an IOPA. Patient was recalled after 15 days.

Prosthetic procedure

After 15 days when healing was good and healthy gingival collar was formed (fig 6) around the healing abutment, impressions were planned. An open tray impression was made using putty and light body [Aveu gum Aveu] with an open tray impression coping [Osstem R] in place (fig 7,8). Impressions were poured. Jig trial was done, jig was made using pattern resin. IOPA radiograph was taken to evaluate the fit of the abutment.

Metal trial (fig 9,10) and bisque trial were done for custom made abutment. A screw retained metal ceramic crown was fabricated according to the selected shade of the adjacent teeth. The final restoration was checked in the patient with an IOPA for the internal fit to the body of the implant and occlusal adjustments were made before cementation was done (fig 11,12). As the Prosthesis was screw cement retained, it was cemented over the abutment extraorally and then assembly was screwed intraorally.

FIG 1: Incision given

FIG 2: Flap raised



FIG 3: Placement of the Implant



FIG 4: IOPA radiograph immediately after the placement.



FIG 5: Suture placement

FIG 6: After 4 months soft tissue collar seen post removal of the gingival former



FIG 7: Impression coping in place

FIG 8: Open tray impression with putty and light body

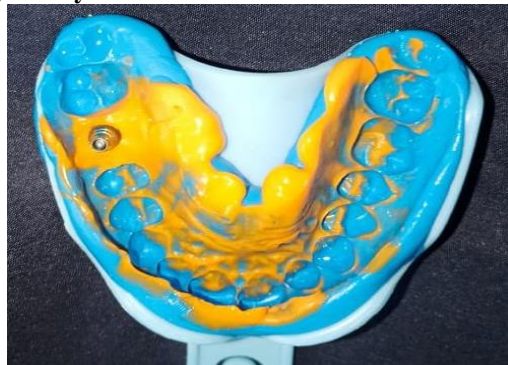
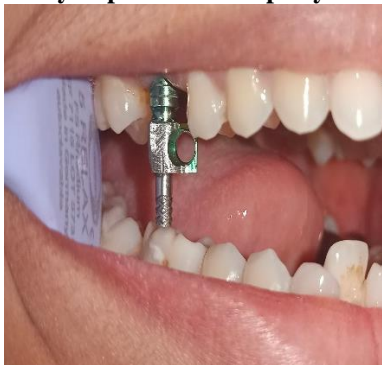


FIG 9,10: Metal try in



Fig 11,12: Final restoration



IV. Discussion

It is important to consider the biology of the surrounding tissue and plan a prosthodontically driven implant placement.¹¹ Preoperative evaluation of the dimension of residual ridge is very important to develop an appropriate placement strategy and to preserve adjacent anatomical structures.¹²

This case report discussed about the treatment planning, surgical placement, prosthetic restorations of implant in maxillary posterior region. Usually, cement or screw retained prosthesis is fabricated but in cement retained prosthesis excess cement left behind is a major problem and can result in soft tissue damage, bone loss and or chronic inflammation. Whereas, screw retained are associated with screw loosening complication especially in single crown restoration. Taking this into consideration in this case the screw cement retained prosthesis (SCRCP) was fabricated which gives benefits of the both screw and cement retained. It gives passive fit, uncomplicated maintenance, ease of retrievability.¹³⁻¹⁵ Whenever possible screw access hole for the posterior teeth should be located on the occlusal central fossa of the crown.¹⁶

Fixed dental implant supported prosthesis has shown many benefits over the removable prosthesis or tooth supported prosthesis.¹⁷ Alternate treatment options considered for this case were a removable partial denture which can contribute to alveolar bone loss¹⁸, also it has very low satisfaction rate¹⁹. Another option being fixed partial denture would have compromised adjacent tooth to a certain limit. Hence an implant supported prosthesis is a more suitable treatment modality.

V. Conclusion

Replacing the missing tooth with dental implant with precise planning, surgery and prosthesis gives desired results and has shown many benefits over the other tooth replacement options. It provides restoration of form, function and aesthetics to the patient. This case report demonstrates a screw cement retained prosthesis in maxillary first molar.

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