

Prosthetic Management of Implants Placed In Anterior Maxilla: A Case Report

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Abstract: *Esthetic outcomes have become key elements that are critical to defining success in implant restorations. Long-term studies have demonstrated that single or multiple implants are highly predictable with high survival rates. However, in the anterior maxillary zone, the aesthetic success of implant therapy is, for many, as important as the implant survival rates. Several factors contribute to this "success" and can be objectively evaluated. These include the patient's healing capabilities, the level and condition of the existing soft and hard tissues, and the provisional and final restorations. Esthetic outcomes have become key elements that are critical to defining success in implant restorations. In the anterior maxilla buccal cortical plate becomes thin after extraction of natural teeth, so implant placement has to be done off axis. Prosthetic management of this off axis placed implant becomes difficult with screw retained prosthesis.*

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I. Introduction

The introduction of osseointegration by Branemark and coworkers and replacement of lost teeth by implants have revolutionized oral rehabilitation while significantly advancing restorative dentistry. The use of dental implants in the maxillary anterior region to replace missing teeth is a viable treatment option. There are many benefits of fixed dental implant-supported prosthetics versus traditional crown and bridge or removable tooth-borne prosthetics.¹ Maintenance of residual bone, ease of oral hygiene, increased longevity, and noninvolvement of adjacent teeth are a few advantages of using dental implants. In the anterior maxillary zone, the aesthetic success of implant therapy is, for many, as important as the implant survival rates.² Patients increasingly demand restorations that are as esthetic as they are functional. Unlike implants in the early years of osseointegration, many of the implants now being placed are in the anterior maxillary region and other esthetically sensitive areas.¹ The current definition of success in addition to long-term predictability, function and integration of the implant focuses on esthetic considerations.³

The presence of thin buccal cortical plate in the anterior maxilla possesses a challenge in placement of implant in ideal position. Thin cortical bone in the anterior region leads to placement of implant in more palatal direction leads to excessive angulation of implant in relation to long axis of adjacent tooth which causes difficulty in prosthetic rehabilitation in that region.

Off axis implant placement can sometimes be compensated with angled abutments that still allow screw retention. For these angled abutments to be used the angle compensation must be more than 17 degrees. This is to allow sufficient divergence in the trajectory of the abutment screw to still allow housing for the retentive screw of the restoration. If the divergence of the implant axis and the retaining screw of the abutment to receive the restoration is less than 17 degrees, there remains insufficient bulk of the abutment to house the retaining screw of the restoration. In these situations conventional screw retention of restorations is not possible.⁴ Lingual set screws can be incorporated in order to retain restorations on, essentially, abutments designed for cement retention, but these are technically challenging to execute. Alternative methods to displace cemented implant restorations have also been described. One design used screws to displace cemented crowns by pushing against abutments.

This is a case report describing the management of off axis placed implant in anterior maxillary region.

II. Case report

A 28 year old male patient presented to the Department of Prosthodontics, Government College of Dentistry, Indore, with chief complaint of loss of upper front teeth since 2 years due to trauma. Detailed intra oral examination revealed that there is missing teeth on 21 and 22 regions (Fig 1).



Fig 1: Pretreatment extraoral photographs

Patient's general periodontal condition was healthy, despite the fact that he did not seek regular professional oral hygiene and pocket depths were less than 3mm in all teeth. Study models were made and articulated. Radiographs were taken to assess available bone height and width. The patient was presented with various treatment options, after discussing the pros and cons of all treatment options patient was agreed upon for implant placement in missing teeth area. Diagnostic wax up was done to evaluate mesiodistal and apicoincisal space available for prosthetic rehabilitation. After thorough diagnosis and treatment planning a two stage surgery for implant placement was planned for better osseointegration. Because of insufficient buccolingual width, endo-osseous implant measuring 3 × 10 mm in dimension were selected for placement in 21 and 22 region. Due to thin buccal cortical plate off axis implant placement was the option. Thus restoration with customized abutment and cement retained prosthesis were planned.

III. Treatment Procedure

Following an injection of 2% lidocaine with 1: 80,000 anaesthetic agent in the area of the missing central and lateral incisor. Flapless implant procedure was performed. Soft tissue punch was used to create access opening. Osteotomy drilling was done with the help of the surgical template (Fig 2).



Fig 2: Osteotomy drilling with the help of surgical splint

A parallel sided, threaded, rough surface implant was then placed and primary stability was achieved at 35N and cover screw was placed. The patient was seen post-surgically after 1 week for follow up and no untoward sign or symptom was noted. Four months after implant placement cover screw was removed and the healing abutments were placed (Fig 3).



Fig 3: Healing cap placement after second stage surgery

After 15 days once the gingival collar was formed, impression copings were placed and Poly Vinyl Siloxane close-tray impression was made to capture the implant position. The impression copings were removed and the healing abutments were replaced. The case was then sent to the laboratory for the fabrication of custom abutment using UCLA abutment. Cement retained all ceramic crowns were fabricated (Fig 4,5,6,7).



Fig 4: Customised abutment try in



Fig 5 & 6: Crown cemented over customized abutment



Fig 7: Post op extra oral photographs

After the fabrication, custom abutments were seated onto the implant and x ray was done to verify the complete seating of abutments. The final crowns were then tried in. The proximal contacts and occlusion was checked. In maximum intercuspation there was light contact with no contact in protrusive and lateral excursions. The crowns were then cemented using a noneugenol based temporary cement. Oral hygiene instructions were given to patient and recalled after 3 months for regular check-up.

IV. Discussion

Placing dental implants in the maxillary anterior region requires precise planning, surgery, and prosthetic treatment. To achieve a successful esthetic result and good patient satisfaction, implant placement in the esthetic zone demands a thorough understanding of anatomic, biologic, surgical, and prosthetic principles. The ability to achieve harmonious, indistinguishable prosthesis from adjacent natural teeth in the esthetic zone is sometimes challenging. Placement of dental implants in the esthetic zone is a technique-sensitive procedure with little room for error.

In this case there was thin buccal plate resulted in off axis placement of dental implant. Because of the position of the implant it was impossible to provide angled abutment or screw retained prosthesis as it resulted in placement of screw hole on labial surface. Presence of screw on labial surface compromises the esthetics of prosthetic rehabilitation so we planned for customize abutment with cement retained crown so as to provide better esthetic results.

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