

## CASE REPORT

# Management of Malpositioned Maxillary Anterior Implant by using Patient Specific Abutment: A Clinical Case Series

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## ABSTRACT

**Aim:** To rehabilitate the patients with labially placed implants in maxillary anterior region to achieve optimal esthetics, emergence profile and function, along with the preservation of surrounding hard and soft tissue.

**Background:** Rehabilitation of a patient with maxillary anteriors with labially placed implant is always a challenge for a prosthodontist. If prefabricated abutments are used, labial contour would be too bulky that the implant-supported prosthesis would be out of arch.

**Case description:** This case series describes the use of patient specific abutments which are restored with zirconia prosthesis for optimal esthetics and function. This article also discusses the problems faced while rehabilitating such cases.

**Conclusion:** Unique surgical concepts are implemented for proper results to obtain ideal prosthetic restoration for missing teeth in esthetic regions. If surgical management is not chosen, prosthetically these cases can be managed by the use of customized abutments as described in this clinical report.

**Clinical significance:** Use of patient specific abutments as describe in this article resulted in satisfactory restoration in terms of function and esthetics in the critical maxillary anterior region.

**Keywords:** Maxillary central incisor, Custom abutment, Zirconia prosthesis.

**How to cite this article:** Vyas A, Khare E, Desai P, Dhiman Y. Management of Malpositioned Maxillary Anterior Implant by using Patient Specific Abutment: A Clinical Case Series. *Int J Oral Implantol Clin Res* 2014;5(2):79-82.

**Source of support:** Nil

**Conflict of interest:** None

## INTRODUCTION

The replacement and rehabilitation of a missing single tooth with dental implants is now a routine procedure.<sup>1,2</sup> In highly esthetic anterior region, soft tissue drape is often the most difficult aspect of treatment. However, it is easy to maintain an inventory of prefabricated abutments but it becomes

expensive due to lab charges for milling to customize for every patient. In addition, peri-implant tissue which had healed around the generic shape of stock healing components did not conform well to the contours of the final abutment, making the delivery of final restoration more difficult and less comfortable for the patient. Moreover, it increases chairside adjustments of the abutments to achieve proper fit and ideal emergence profile.

On the contrary, the fit and contours of the prosthesis obtained by use of custom abutments have been close to perfect. These prosthesis adheres nicely to the soft tissue architecture sculpted by the custom components used during the healing phase and require very little or no adjustments. Additionally, the final abutment margins of these restorations demonstrate exceptionally well support to the soft tissue immediately upon their placement.

In this case series, we examined the replacement of a maxillary central incisor with a straight and angulated abutments. Because of very labially inclined implants openings, we used custom abutments and zirconia crown for optimal esthetics and function.

## CASE DESCRIPTION

The first case was a 54-year-old male patient, who reported with the chief complaint of missing upper front teeth since 10 years. He has been wearing removable partial denture since 7 years. No significant medical history was found. On intraoral examination, it was found 11 and 12 were missing. But space for only one tooth was present.

While the second case reported was a 60-year-old male patient with the chief complaint of missing upper front teeth since 4 years. He was also wearing removable partial denture since 4 years. No significant medical history was found. On intraoral examination, 21 was found to be missing.

In both the cases during surgical phase, buccal cortical plate was found insufficient, and hence implant had to be placed more labially inclined.

During second phase of surgery, cover screws were removed and gingival formers were located. At the 4th month, gingival formers were unscrewed and final impression of the maxillary arch was made using polyvinylsiloxane (Ivoclar Vivadent, Liechtenstein, USA) while the transfer coping and caps were in place.

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The abutment analogs were secured in their places in the impression and casts were poured in type IV hard plaster. Abutment selection was performed in the patient's mouth and on the definitive cast. The maxillomandibular relationship was obtained by using a face-bow and from bite records. Casts were mounted on a semi-adjustable articulator.

Straight abutments were tried and found excessively in labial position that would not allow proper crown placement (Fig. 1). Angulated abutments were chosen due to axial position problem (orofacial direction) of the implants. However, even angled abutments were insufficient to eliminate excessive labial emergence.

So only treatment modality possible was to use custom abutment (UCLA) in these cases. Hence, patients were educated about their cases and suitable treatment plans. Models were sent to the lab with instructions to achieve ideal implant position.

Abutments were attached to the implants, screwed on to them and tightened to 35 Nm using ratchet and ratchet hex driver (Figs 2A and B, and 3A and B).

Radiographs were taken at baseline (Figs 4 and 5) after 6, 12 and 24 months in order to control the bone level implants. Patients were informed on oral hygiene and instructed in the

specific care for her new restoration including tooth brushing and flossing. Follow-ups were done at monthly intervals for 3 months and then once every 6 months for 2 years.

For both the patients zirconia lava (3M ESPE, USA) crown was choosened as a final prosthesis. Which were colored using VITA A3 for incisal two-third of tooth and



Fig. 1: Intraoral view showing labially oriented prefabricated abutment (case 1)



Figs 2A and B: Intraoral view showing improved emergence profile with customized abutment (case 1)



Figs 3A and B: Intraoral view with custom abutment (case 2)





**Fig. 4:** Intraoral periapical radiograph showing custom abutment over implant body (case 1)



**Fig. 5:** Intraoral periapical radiograph showing custom abutment over implant body (case 2)



**A**



**B**

**Figs 6A and B:** (A) Intraoral view of final prosthesis on customized abutment and (B) Extraoral view of final prosthesis on customized abutment (case 1)



**A**



**B**

**Figs 7A and B:** (A) Intraoral view of final prosthesis and (B) Extraoral view of final prosthesis (case 2)

A3.5 for cervical third with esthetic enhancement using ceramic stains in labiocervical region (Figs 6A and B, and 7A and B).

During delivery of final prosthesis crowns were cemented using resin bonded cement (Rely X, 3M ESPE, USA).

## DISCUSSION

The highly esthetic anterior zone often requires hard (bone and teeth) and soft tissue restoration. The soft tissue drape is often the most difficult aspect of treatment.

The implant body is placed so that its facial position is more than 1.0 mm from the ideal facial contour and is at least 1.5 mm from the adjacent teeth.

In literature, three faciopalatal angulations of the implant body are suggested as follows:

1. Facial angulations, so that the emergence of the final crown will be similar to adjacent teeth.
2. Under the incisal edge of the final restoration.
3. Within the cingulum position of the implant crown.

The location of the cervical margin of a cemented crown can be anywhere on the abutment post or even on the body of the implant, provided it is 1 mm or more above the bone. Implant should be countersunk below the crestal bone more than 4 mm below the facial CEJ of the adjacent teeth so as to develop a crown emergence profile similar to a natural tooth, prevent soft tissue recession, and support the adjacent tissue of the adjacent natural teeth.

The ideal platform level for a two-stage implant is similar to the ideal bone level after the loss of a natural tooth, which is 2 mm below the adjacent tooth CEJ. This positions the platform of the implant 3 mm below the facial free gingival margin of the implant crown. But sometimes on the basis of availability of bone, surgical phase is performed against the above mentioned protocol, which in turn makes prosthetic phase more challenging. Also, the abutment should be able to transfer the forces along the long-axis of implant body, These cases can be managed by the use of patient specific abutments as described in this clinical report, thus achieving optimal emergence profile and function.

## CONCLUSION

Contrary to what patients feel concerning missing posterior teeth, most all patients have an emotional response regarding

a maxillary anterior missing tooth. No question exists regarding the need to replace the tooth and financial considerations bare less important.

Anterior tooth loss usually promises ideal bone volume and position for proper implant placement. Implant diameter, compared with that of natural teeth, results in challenging cervical esthetics.<sup>3</sup> Unique surgical concepts are implemented for proper results. If surgical management is not chosen. Prosthetically, these cases can be managed by the use of customized abutments as described in this clinical report. In spite of all the technical difficulties that may face the restoring dentist, the anterior single-tooth implant is the modality of choice to replace a missing anterior maxillary tooth.

## CLINICAL SIGNIFICANCE

Rehabilitation of a patient with maxillary central incisor with labially placed implant is always a challenge for a prosthodontist. If prefabricated abutments are used, labial contour would be too bulky that the implant-supported prosthesis would be out of arch. Thus, this case series describes the use of patient specific abutments which are restored with zirconia prosthesis for optimal esthetics and function.

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