

Prosthetic management of malpositioned implant in mandibular overdenture: A case report

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Abstract

Careful consideration is necessary regarding the 3-dimensional orientation of the implants to ensure adequate horizontal and vertical space for prosthetic components. This clinical report describes a patient with two mandibular implants, in which one implant tilted labially. An alternative prosthetic method is used to compensate for malposition implant. This article describes the effective and conservative management of angulated implant to achieve an enhanced outcome with implant overdenture treatment, even with a less-than-ideal clinical presentation.

Keywords: Angulated implant, Ball attachment, Mandibular overdenture.

Introduction

The use of dental implants in the rehabilitation of the edentulous mandible has demonstrated a remarkable improvement in the patient’s oral health status when

compared to conventional complete denture [1-2]. An implant-retained overdenture requires more treatment planning than a conventional complete denture, proper treatment planning and execution lead to favourable implant placement, a successful prosthetic restoration and ultimately patient satisfaction; however, implant malposition may occur, which can lead to an unsuccessful prosthesis. This can result from poor treatment planning and poor surgical technique, inaccuracies in the surgical guide, failure to use the guide, or the use of an unstable surgical guide [3-4].

An important consideration in fabricating a mandibular overdenture is ensuring sufficient space for the prosthetic components of the implant attachment system. Inadequate space for prosthetic components can result in an over contoured prosthesis, excessive occlusal vertical dimension, fractured teeth adjacent to the attachments,

attachments separating from the denture, fracture of the prosthesis, and overall patient dissatisfaction [4].

This clinical report describes a patient with two mandibular implants, in which one implant tilted labially, and suggests an alternative prosthetic method to compensate for malposition implant.

Case Report

A 76-year-old female presented in department of prosthodontics with a compromised 2-implant-retained mandibular overdenture opposing a maxillary complete denture. Right side implant was labially tilted and surrounded by lack of attached gingiva (figure 1). Labial flange of overdenture were impinging the labial mucosa. Evaluation revealed that the both implants were located in the canine position, but right implant was labially inclined (figure 1). A review of the patient's dental history indicated that the overdenture prosthesis was fabricated 2-3 times in last five year due to pain and inflammation around the implant while chewing graft was stabilized at recipient site.



Figure 1: showing labially tilted right side of ball attachment

To achieve the healthy attached gingiva and parallelism among both the implants, Patient was given treatment options like removal and replacing the parallel implant or replacement of attachment using angled attachment and mucogingival surgery to get the attached gingival cuff

around the implant. As the patient preferred a conservative treatment approach so straight ball attachment system replaced with 30 degree angulated ball attachment and subsequently mucogingival surgery was planned.

To increase the width of attached/keratinized gingiva free gingival graft was harvested bilaterally from the palate considering the dimensions of vestibular extension required, and the graft was stabilized at recipient site using 4/0 resorbable vicryl suture. It was kept for a period of 2 week. After initial epithelisation suture was removed both from recipient and donor site. (Figure 2A, 2B, 2C, 2D)



Figure 2A : Donor site from where graft harvested



Figure 2B: Flaps raised



Figure 2C: Graft stabilised at recipient site



Figure 2D: post operative and after placement of 30 degree angled abutment

Primary impression was made using irreversible hydrocolloid impression material. Maxillary final impression was made using conventional technique. For mandibular final impression custom tray was fabricated and window was created for open tray pickup/direct impression (figure 3) of implant position. Border moulding was completed, low viscosity polyvinyl siloxane loaded in the tray, after complete polymerization the screws of impression coping was loosened and impression was removed, implant analogue was seated into impression coping prior to pouring of definitive cast. Autopolymerising resin was used for fabrication of denture base over definitive cast. Using face bow record upper cast was mounted then centric relation was recorded. Teeth arrangement was completed and try in

was done. Maxillary and mandibular denture was cured. Denture finishing and polishing was done in conventional manner. Ball and socket over-denture attachment was used. As right side of implant was labially tilted 30 degree angulated ball attachment was tried. Satisfactory parallelism was achieved with left side straight ball attachment. The emergence profile of the right side ball abutment also improved because of the angled abutment. Direct pick-up technique is used for ball cap placement in the mandibular denture. The ball attachment were placed and ball cap along with O rings seated on ball abutment and blocked-out at the periphery of the abutments. Acrylic resin from the intaglio surface of the denture was removed using a No. six round bur to vent the pick up space toward the surface of the denture and to allow passive fit of the denture against the tissue. Pressure indicating paste was used to verify that no contact of the denture base with ball attachment assembly.



Figure 3: Impression made by open tray technique

The pick-up space was half filled with pattern resin and the mandibular denture was placed over the attachment assembly to retrieve the ball cap in the denture.(Figure 4) The complete seating of the denture was verified and the patient was asked to maintain light occlusal pressure in the centric relation position while the resin polymerizes. The pick-up resin was trimmed and polished in the venting area.



Figure 4: intaglio surface of mandibular over denture
Denture was delivered (Figure 5, 6) and patient was instructed about the aftercare and recall schedule.



Figure 5: Occlusal view of mandibular denture



Figure 6: profile view post denture insertion

Discussion

A 2-implant-retained mandibular overdenture is considered by some to be the standard of care for mandibular Edentulism [5]. Compared to a conventional complete denture, an implant-retained overdenture requires more thorough planning. Careful consideration is necessary regarding the 3-dimensional of the implants to ensure adequate horizontal and vertical space for prosthetic components [2].

Improper implant placement can sometime make the prosthetic rehabilitation complicated. In such condition, ideal and usual treatment procedure may not be used. The labially tilted implant in this case resulted in many problems including impingement of labial mucosa by attachment, lack of implants parallelism may affect retentive capacity of the attachment system, forces applied to the implant through the attachment will not be in the long axis of the implant and will increase the chances of failure from implant overload or prosthetic failure. Problems with attempts to restore severely malposition implants are multiple. Often, due to labial positioning of the implant, no attached gingiva remains on the facial surface, which can cause eventual peri-implantitis, especially if aggravated by muscle pull or denture border impingement. In this clinical case report, the patient experienced discomfort, restriction during oral hygiene performance, and plaque accumulation due to a lack of keratinized mucosa, requiring a free gingival graft [6-7]. The free gingival graft, which was performed before placing the final prosthesis. As the patient was chronic denture wearer, alveolar ridge resorption leading to a shallow vestibule and inadequate width of attached gingiva is a probable end result and also as the implant was tilted there was an urgent necessity to not only correct the angulation of tilted implant to maintain the path of insertion but also increase the vestibular depth so that

there is no impingement of the denture flanges on the oral mucosa.

The most commonly used prosthesis for the mandibular overdenture are two implants in the canine areas with a stud attachment mechanism (i.e., ball attachments) [2]. The predominant categories of retention for mandibular overdenture are either bars or individual attachments. However, bars prescribed for mandibular overdenture complicate and increase the cost of the prosthesis. They are also more technique sensitive and generally require more space than individual attachments [8]. In this case ball attachment was used. As right side of implant was labially tilted 30 degree angulated ball attachment was tried. Satisfactory parallelism was achieved with left side straight ball attachment. Patient was satisfied with the treatment. If compensation of Malpositioned implant prosthetically not possible, trephine removal of the implants may be considered.[3]

Conclusion

Within the limitations of this case report describes the effective and conservative management of labially tilted implant to achieve an enhanced outcome with implant overdenture treatment, even with a less-than-ideal clinical presentation.

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