

PROSTHODONTIC REHABILITATION OF RESORBED EDENTULOUS MANDIBLE USING ENDOSSEOUS IMPLANTS AND LOCATOR ATTACHMENT RETAINED OVERDENTURE

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ABSTRACT

Conventional complete denture fabrication is a challenge to fabricate in a patient with resorbed ridge and improve the quality of life of a patient. Retention, stability and functional need is difficult to satisfy more in mandibular arch compared to maxillary arch. Implant supported overdenture with various attachment systems are good options to enhance the quality of life of the patient. Of all the attachment available for implant supported overdenture locator system has the lowest profile, universal hinge and easy to fabricate. Patients with mandibular overdentures retained by 2 implants interforaminally had higher satisfaction scores than conventional complete denture patients.

KEY WORDS

Implant, Overdenture, Locator

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INTRODUCTION

Edentulism exists, it will remain prevalent and its management is beneficial to the affected population and society¹. The truth is “the predicament of being both elderly and edentulous undermines life quality for both patient and dentist. The former suffer because of morphological and functional compromises the latter because of dearth of safe and predictably successful clinical techniques². It is more pronounced in the mandible than the maxilla. The continued resorption of the mandibular alveolar bone is associated with greater difficulty with denture construction. This absence of teeth is also associated with reduced social and physiologic function³. The selection of the overdenture versus a fixed implant prosthesis may be favoured on initial cost advantage⁴. According to the McGill consensus statement on overdenture, a two implant overdenture should become the standard of care of the edentulous mandible⁵. To connect implants with overdenture, self aligning attachment system (for example the locator@; Zest Anchor homepage, Escondido, CA, USA) and traditional ball attachments (eg. Dal-Ro@ [Biomet 3i Implant Innovations Palm Beach Gardens, FL, USA] and TG-O- Ring@ [Cendres & Metaux SA, Biel-Bienne, Switzerland] are available. The need of prosthodontic maintenance varies from system to system.

CASE HISTORY

A 65 year old female patient reported with major complaint of inability to chew due to ill fitting lower denture. The patient had been wearing complete denture for last 10 years. The patient medical and dental history was recorded revealing absence of any major disease. The consent of the patient was obtained and all the surgical and prosthetic procedure was explained prior to the procedure.

The upper and lower primary impression was recorded to prepare the diagnostic cast for proper treatment planning and fabrication of custom tray. CBCT was done to assess the quality and quantity of bone for selection of appropriate implant. According to Prosthodontic Diagnostic index for complete



Figure-1: Bone Height less than 15mm



Figure-2 : Mucoperiosteum flap raised from canine to canine



Figure-3 : After 4 months osseointegration achieved



Figure-4 Healing abutment placed



Figure-5 Locator abutment placed



Figure-6 Blockout Spacer



Figure -7 Black Processing Ring



Figure - 8 Black Processing Ring Removed



Figure - 9 The blue male nylon insert

denture as proposed by American college of Prosthodontist it was found that bone height-mandibular was Type III (bone height 11to15mm)⁶ [figure1]. A complete denture was fabricated restoring the lost vertical dimension and enhancing the fit of the denture. The standard implant sizes of (4.5x11) were placed by raising the mucoperiosteum flap from canine to canine region [figure2]. After the placement of implant standard post operative instruction was given. The patient was instructed to desist from wearing the denture till proper healing occurred. After 2 weeks the suture was removed and lower denture was relined with temporary silicon base soft relining material (Voco Ufi Gel P).

After 4 months of placement of implant CBCT was done to evaluate the proper osseointegration of implant. [figure3] The flap was raised and healing abutment was placed. [figure4] After 3 weeks the healing abutment was removed and depth measurement from the coronal aspect of implant to the highest point of gingival was measured with World Health Organization periodontal probe. It

helps in proper selection of locator abutment height.

The 2mm height locator abutment was selected and placed with the help of locator abutment driver [figure5]. The abutment was tightened to 25-30 N with torque wrench. The denture can be connected with the locator abutment either by direct method or indirect method. The chair side direct pickup method was favoured due to its ease of fabrication. White block out spacer was placed [figure6] and black processing ring was used to attach the metal housing on the locator abutment [figure7]. The black processing ring was removed after setting of self cure acrylic resin. [figure8] The blue male insert was given to the patient. [figure9]. The retention can be increased by changing the male insert in metal housing if required. It was ensured that the lower denture with nylon male part in metal housing seated properly on the female locator abutment. The patient was given instruction regarding wearing of lower denture and proper cleaning of denture with its attachment.

DISCUSSION

As the successful use of dental implants in the treatment of mandibular edentulism is well documented in the literature for both fixed and removable prosthetic rehabilitations^{7,8}. Success rate (as measured by the continual osseointegration of implants) of 1-10 years which supported the ODs in the mandible ranged from 91.7% to 100% and the mean implant survival rate was over 98%, both of this supports the presumption that this treatment has a good prognosis in a long term perspective. At least 13-14 mm interocclusal space is required for bar supported OD considering teeth size, denture base thickness, bar thickness for the rigidity, the space from the mucosa to the bar for hygiene and the soft tissue thickness⁹. Minimum space requirement for ball attachment is 10-12 mm and for locators are 8.5mm¹⁰. Attachment system selection usually depends on the working experience of the dentist and their technician. Few studies have been undertaken to compare these systems in order to provide dentists with clinical evidence to help them reach the best clinical decision¹¹.

The locator the self aligning implant attachment system has been on the market since 2000. In unique design of the locator the patrix (male) is the replaceable nylon insert on the under surface of the overdenture. The matrix (female) is by virtue, again of its unique design, the overdenture abutment on the implant using a dual retention approach with different retentive value. It is classified as a resilient universal hinge device and is designed for limited inter-arch distances enabling inter implant angles to be fixed upto 40 degree¹². In cases of implant angulations correction, the nylon component of the Locator system do not have studs for inner retention of the abutment.^{13,14} It consists of a titanium matrix and a nylon coated patrix and is available for a number of implant system. Patrix nylon inserts are colour coded to indicate different retentive forces. Limited vertical heights, self alignment, and the ability to compensate for divergent implant axes have been cited as advantages of the Locator system. Well designed studies have proven the long-term success of mandibular implant retained overdentures with different attachment system. High initial retentive grip with diminishing values under cyclic loading and a reduced longevity of the Locator nylon inserts have been confirmed by experimental studies. One major advantage of the Locator attachment system is its capability for easy maintenance of hygiene. The implant overdenture success is dependent on survival of implant, peri implant aspect, prosthetic maintenance and complications¹⁵.

CONCLUSION

The case report describes the prosthodontic rehabilitation of a patient with Locator attachment retained overdenture which is cost effective and

needs less prosthetic dexterity compared to other attachments. The articles aim to highlight the advantages of Locator attachment as well as its treatment modalities.

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