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Dental Implant Retained Mandibular Over-denture with Locator Attachments – A Case Report

Dr.Saurabh Jain[1], Dr.Paresh V Gandhi[2], Dr.Prachi B Bhatia [3]
[1,3](PG Student, Bharati Vidyapeeth Deemed University Dental college and Hospital, katraj, Pune)
[2](Professor, Bharati Vidyapeeth Deemed University Dental college and Hospital, katraj, Pune, India)

Abstract : *Management of the completely edentulous patients has been a herculean task for the prosthodontist. A large number of geriatric patients are unable to cope with the conventional complete denture treatment. A common complaint of loose, ill-fitting mandibular dentures is observed. Implant supported over-dentures is a convenient and a practical solution to the common problems faced by patients using conventional dentures. In this case report the patient is rehabilitated with two mandibular implants with locator attachments and a conventional complete denture in the maxilla.*

Keywords: *Attachment, Implant, Locator , Overdenture*

I. Introduction

Numerous edentulous patients do not wear their prosthesis as they do not stay in place, this is a common problem faced by patients who have resorbed alveolar bone . The dentures are kept in place by a fine balance between the muscle forces of the cheek and tongue. For patients who are unable to do so, implant supported over-dentures is minimally invasive and cost effective option. The use of locators as an attachment system has advantages such as dual retention, minimal inter-arch requirements, ease of use etc, and thus has been used as the attachment of choice for this case report.

II. Case Report

A 58 year old patient presented to the Department and complaint that "My denture falls out while speaking." .Dental examination revealed that the mandibular alveolar ridge was resorbed, the patients previous dentures were worn out due to which his vertical facial height was reduced. The patient was the given the option of making a new conventional complete dentures, implant supported fixed prosthesis and implant over-denture. The patient opted for the over-denture option which was stabilized by two dental implants with locator attachments due to financial constraints for fixed implant supported prosthesis and the non-compliance with conventional complete dentures. Feine et al. stated that the two-implant retained overdenture should be the first treatment choice for mandibular edentulous patients.[1,2]
Conventional Complete Dentures were fabricated to estimate and establish the vertical dimension of the patient.

Surgical Phase 1

The mandibular denture was duplicated using irreversible hydrocolloid (Neocolloid) and used as a surgical guide for implant placement with chemically cured clear acrylic resin(DPI-RR). Two holes were drilled using a round bur into the acrylic resin guide in the B and D positions keeping in mind the bone dimensions in those regions. The holes were widened for unobstructed movement of the pilot drill during osteotomy.
Two implants of Equinox myriad(3.8*11.5mm) were placed in the B and D positions. After 3 months stage 2 surgery was performed, it was noted that implant in the position D had undergone surgical failure. It was then decided to place an additional implant in the E (3.8* 10mm) position (Biohorizon Taper Internal RBT). During the surgical procedure for the placement of the implant in the E position the failed implant in the D position was removed.

Surgical Phase 2

Additional 3 months were given for osseointegration of the implant in the E position. Stage two surgery was performed for the implant in E position and healing abutments were placed. The conventional dentures were relieved from the intaligo surface and relined (GC soft Liner) and used by the patient.

Prosthetic Phase

Impression was made in elastomeric impression (3M ESPE Express™ XT Soft Putty) material using a closed tray technique where an edentulous stock tray was used (fig 1). Jaw Relation records were made followed by a try-in like in conventional single complete denture procedures. Semi-anatomic teeth were used to fabricate

the lower denture and it was processed using injection moulding technique with the locator housing in the denture base. The locators were transferred from the cast and attached on the implants during the final prosthetic stage using a locator driver (fig 2). The occlusion of the patient was adjusted to a bilateral balanced occlusal scheme. The patient was satisfied with his new prosthesis after 3 and 6 months of follow –up.

III. Discussion

Implant supported over-dentures are known to improve retention and stability of the prosthesis, preservation of the alveolar bone is an added advantage. When two implants are placed they may be splinted or lone standing. Javier Ata- Ali et.al. studied the long-term implant survival rates of over-dentures, it was noted that age, sex and splinting the implants together did not influence the survival rates of implant overdentures.[3] In case of incorrectly angulated implants, stock abutments may not provide the desired compensation, and the splinting of the implants with the interconnecting bar can overcome these problems. An advantage of the prefabricated stock abutments is that the abutment itself can be easily replaced in case of an abutment failure.

Locators are a choice of attachment system for lone standing implants due to its advantages such as dual – retention, pivoting features, and reduced inter-arch distance which is required as compared to other attachment systems. [4]

The Locator Attachment

The dual-retention feature ie. the nylon cap engages the inside and outside portion of the female attachment.(fig -3)This provides greater surface area for retention. The rounded occlusal contours of the female element work in conjunction with the skirt of the nylon cap thus making the attachment self-aligning. The pivoting feature is a great advantage of the attachment system. It can be used when the implants are divergent. This allows complete seating of the prosthesis without excessive wear of the nylon inserts. The maximum vertical space required 2.27mm above the soft tissue. The pros of using locators out numbers the cons, thus making it the attachment system of choice.[5]

In the treatment option given to the patient, implants were not connected to each other, and the retention mechanism was provided by the locator attachments.

The cause for failure of the implant in position D remains unresolved, it maybe due to overheating of the bone while preparing the osteotomy or the excessive loading on the implant during the osseointegration stage as the patient continued to wear his relined dentures over the implants. The failed implant was replaced by another implant system(Biohorizon RBT). The Myriad implants have an asymmetrical surface extensive thread design the Bioprofile ^{TM}. Thus to avoid any further failure or delay in treatment the implant system was replaced by Biohorizon RBT implant which uses a square thread design. As Most FEA and animal studies have shown that the most effective stress distribution is noted in the square thread shape type of thread design. Thus a change in the implant system was made. [6,7]

The closed tray technique was used to wherein the 3 in 1 abutment was used for the Biohorizon implant during the impression procedure and the impression cap was directly picked up in the putty light body impression for the myriad implant. An open tray technique is more accurate than the closed tray and is advocated when the implants are not parallel. Since in the above case report only 2 implant supported over-denture was planned and the implants were relatively parallel to each other the closed tray technique was used with ease. Also an added advantage of the locator attachment system is the provision for Extended Function nylon caps which can be incorporated into the metal housings within the denture base in case the implants are not parallel.

IV. Conclusion

Rehabilitation of the resorbed edentulous mandible is a challenging task. A two implant supported over-denture option is a simple, cost effective and minimally cumbersome option for rehabilitation of such patients. The clinicians and technicians have to weigh the pros and cons of every individual case and the feasibility of the procedure before its conduction.

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Fig 1– Abutments in place before impression

Fig 2 – Locators in place

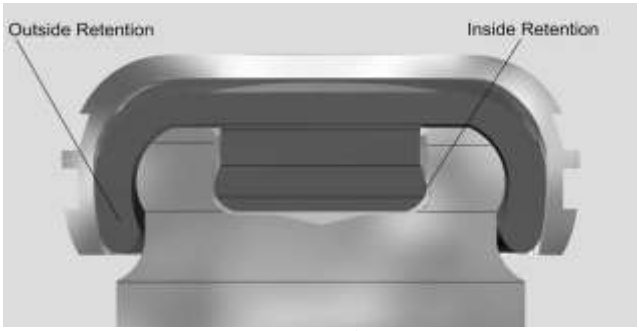

Fig 3 – Schematic diagram of a locator attachment