

Prosthetic Efficiency of Implant-Supported Overdentures with Locator Attachment: A Clinical Case Report

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Abstract:

Implant supported overdenture is one of the primary treatment options for completely edentulous patients. Many attachment systems are available for clinical application with implant supported overdenture, ball attachments were considered the simplest type. This case report describes the rehabilitation of a patient with generalized bone loss and the teeth with compromised crown root ratio. A clinical approach was formulated to replace the lower arch with implant supported overdenture and upper removable partial denture. Entire lower teeth were removed followed by immediate placement of 4 implants of 3.5 diameter and 11.5 length in the inter foraminal region. Locator attachment system was attached to the implants, and the implants were loaded by which patients was able to enjoy a normal, comfortable chewing function with an unparalleled confidence in the secure fit of their overdenture.

Key Words: Ball attachments, dental implants, locator attachments, overdenture

Introduction

Tooth lost due to trauma, caries, periodontal disease, congenital defects or iatrogenic causes. It is multifactorial and often complex interaction of multiple co-morbidities, which, if left unresolved, may progress to complete edentulism.¹ Edentulism correlates highly with low-income, poor health, and reduced education.² Loss of tooth can cause negative impact mainly on masticatory function and esthetics. Implant supported overdentures provide a good

opportunity to improve the quality of life and oral health. Various treatment modalities like conventional removable partial denture, fixed partial denture, overdentures, and implants exist for rehabilitation of a partially edentulous patient. Implant-supported overdentures have many advantages in comparison with the conventional dentures, including good stability, good retention, reduced residual ridge resorption, improved function, and esthetics. It is also possible to incorporate the existing denture into the new prosthesis. Another advantage is the easier surgical procedure and reduced number of the implants.³ In recent years, various attachments systems have been successfully used with removable implant overdentures. All available attachment systems are designed to intercept the vertical movement of the denture and used as a standalone attachment mounted directly to the implant or attached to a bar system. The choice of the attachment is dependent upon the retention required; jaw morphology, anatomy, mucosal ridge, oral function, and patient compliance for recall.⁴ Ball attachments and bar units for implant overdentures have evolved from the early 1960's. Ball attachments were considered the simplest type of attachments for clinical application with tooth-or implant-supported overdentures. However, it is also well-documented that O-rings slowly loose retention, and must be replaced periodically.⁵ On the other hand, increased technique sensitivity and cost but with favorable stability have been reported regarding the bar attachments. Other disadvantages of the bar system include mucosal hyperplasia, hygiene problems and the necessity of the retention clip's activation.^{6,7}

The locator attachment (Zest Anchors, Inc., homepage, Escondido, CA, USA) which initiated in 2001 is a new system, which do not use the splinting of implants. This extension is self-aligning and has dual retention and in different colors with different retention values.^{8,9} Locator attachments are available at different vertical heights, they are resilient, retentive, and durable and have some built-in angulation compensation. In addition, repair and replacement are fast and easy. Easy to insert and remove from patients, locator attachments designed with customizable levels of confinement and low vertical profile. Most important, is its innovative capability to pivot, which increases the attachment's flexibility and tolerance. The high mastication forces an attachment must withstand, allows it to repay for the path of insertion with up to 40° of dissimilarity between implants, and provides

exceptional durability. This patented pivoting action, along with the attachment's self-aligning design, also provides ease of seating the denture by the patient. This system is also ideal for 1 implant mandibular overdenture. Hence, implant overdenture with locator attachment is a promising option for the edentulous patient.

Key features

Retention and angulation versatility

Options of locator males or extended range males, locator attachment system, provides maximum adaptability in retention and angulation to suit each patient's needs.

Locator males

The pivoting ability of locator males enable for insertion of the overdenture with up to 20° of variance between implants. Locator males are obtainable in 3 different retention force options - 1.5, 3 or 5 lbs. Furthermore, locator males include a unique dual retention characteristic that includes inside and outside retention. It provides the locator attachment with a considerable retention surface area than ever before obtainable with other attachments, providing greater resiliency to enlarge stability and durability.

Extended range males

The pivoting ability of the extended range males permits for insertion of the overdenture up to an extensive 40° of variance between implants. Extended range males are available in 4 different retention force options - 0, 1, 2 or 4 lbs.

Greater resiliency

The locator male remains in static contact with the fitment while the Denture Cap, which processed into the overdenture, has a full range of rotational motion over the male for a genuine resilient relationship of the prosthesis without any loss of retention.

Exceptional durability

Both the locator's pivoting technology and its dual retention feature that encompass inside and outside retention ensure long-lived performance of the attachment. As shown in an independent laboratory test comparing the locator to the stern ERA implant attachment during 60,000 cycles of function.

Lowest vertical height

Can be used in cases with decreased inter arch space.

Case Report

A 54-year-old male patient reported to the Department of Prosthodontics and Crown and Bridge with the chief complaint of the pain of entire lower teeth. Fixed dental prosthesis done 6 years back and needs a replacement. Clinical examination revealed Grade III mobility of entire mandibular teeth due to periodontal breakdown. Clinically his maxillary teeth were healthy with a Kennedy Class I

situation. The patient was advised routine radiographic investigation (orthopantomograph) and blood examination, which showed that generalized bone loss (Figure 1) and the teeth were having compromised crown root ratio. The patient does not have any debilitating diseases and was systemically stable. The patient's diagnostic cast made, studied and an initial treatment plan was suggested. He was given options of extraction of the entire teeth in the lower arch, followed by replacement with a conventional complete denture and upper removable partial denture. He declined the option of conventional complete denture because he needed a fixed prosthetic option. Hence, an alternative approach which could address his complaints was formulated which was to replace the lower arch with implant supported overdenture and upper removable partial denture. In the following appointment, entire lower teeth were removed followed by immediate placement of 4 implants of 3.5 diameter and 11.5 length in the inter foraminal region (Figures 2 and 3). As the patient had a history of periodontal disease; the lower implants were not loaded. As the patient was traveling and cannot be without teeth, it was decided to give an immediate conventional denture with a soft liner. After a period of 1-year, the status of osseointegration was radiographically evaluated. There were no further bone loss and perimplantitis. Once there was no indication of bone loss the locator attachment system attached to the implants, and the implants were loaded (Figure 4). The patient was



Figure 1: Pre-operative orthopantomograph.



Figure 2: Locator attachments-male component.



Figure 3: Implants with abutments.



Figure 4: Female component in denture.



Figure 5: (a) Post-operative intraoral view, (b) extra oral view.

also satisfied with the appearance and performance of the dentures (Figure 5a and b).

Discussion

Locator overdenture implant (LODI) is an ideal treatment alternative for many patients with severe resorption, resulting in very small ridges for implant placement. These edentulous patients who faced with the choice of bone grafting may decline treatment due to additional surgeries or financial reasons. LODIs is placed using a minimally invasive, flapless procedure with intuitive instrumentation. The implants made from strong titanium alloy and are designed to provide primary stability when immediate loading indicated. Easy to insert and remove the patients, the Zest anchors locator overdenture attachment's differentiating feature is the patented pivoting technology. It's novel ability to pivot increases the attachment's tolerance and resiliency tolerance for the high mastication forces a fitment

must withstand. This streamlined performance leads to lesser problems, increased productivity, and long-term patient satisfaction.

Clinical significance

The locator male pivots in its permanent Denture Cap for a genuine resilient relationship of the prosthesis without any resulting loss of retention. The male stays in static contact with the female socket while the Denture Cap has a full range of rotational motion over the male. This pivoting action accommodates for the natural movements during occlusion, providing greater resiliency and prevents dislodgement. In case of attachments that don't pivot, overdenture is locked in a static hold. As the patient is chewing, the attachment can easily disengage because of the opposing forces of occlusion. LODI patients can enjoy a normal, comfortable chewing function with unparalleled confidence in the reliable fit of their overdenture. The locator males and extended range males provide multiple retention levels, 0-5 lbs. It allows us to select the ideal retention and oblige for draw correction of divergent implants based on the number of implants placed and typical patient masticatory function. In contrast to, the typical O-Ball one-piece mini implant have only one level of retention and doesn't allow for draw correction of variant implants. It limits our treatment abilities, possibly compromising denture fit and function.

Conclusion

The current article reveals a case report of overdenture using locator attachment. Locator attachment proved to be more advantageous than ball attachment. This is more significant when limited interocclusal space and divergent implants limit the use of conventional attachment systems. Also, it eliminates the need of frequent repairs as in ball attachments.

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