



**Case Report**

ISSN: 2581-3218  
IJDR 2019; 4(3): 94-96  
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## Fixed jaw overdenture with three implants using equator type components - Clinical case report

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### Abstract

Mandibular overdenture dentures retained by two implants are viable options for oral rehabilitation of elderly patients. Different types of implant components are used for retention of these prostheses in the mouth, with the ball component being the most used. The aim of this study is to present a small variation of the conventional two-implant technique using the ball-type component by adding an implant and also replacing the component with a locator type (Neodent) for retention of the mandibular prosthesis.

**Keywords:** Overdenture, Locator, Prosthesis.

### INTRODUCTION

Removable implants retained by osseointegrated implants are successful treatment options with high patient satisfaction, providing greater comfort, good prosthetic stability and better chewing efficiency compared to conventional prostheses. Retention of a total prosthesis on lower arch implants is performed from the installation of 2 implants and is indicated to improve the quality of life of elderly patients. Anchor systems are used for prosthesis retention, such as: bars and ball and equator components. Retention options for cast bars often represent a higher patient cost and more laborious execution. On the other hand, pin anchoring systems such as ball-type or locator-type attachment have a simpler execution process and a reduced cost. Treatments using 2 implants with the attachment ball component are widely performed in these types of cases.

The objective of this study is to demonstrate a clinical case, where it was opted for the additional installation of an implant using the conventional technique and using Locator-type attachments, in order to increase the retention of the prosthesis, providing more comfort and patient satisfaction.

### CASE REPORT

A 68-year-old woman who used upper and lower total prosthesis, dissatisfied with the instability of her lower prosthesis, wanted to improve aspects mainly related to chewing and aesthetics that brought her discontent in the current condition. The patient had a good maximum mouth opening, no evidence of TMJ problems and no history of parafunctional habits. On intra-oral examination, she had a good upper alveolar ridge and lower alveolar ridge with advanced bone resorption stages, which were found on the jaw CT scan. Due to factors such as patient complaint, age and financial aspects, it was proposed to make a conventional total prosthesis (without implants) in the upper arch and an implant-mucus-supported prosthesis (overdenture) with 3 implants for the lower arch. After proper planning approval by the patient, the implant installation surgery was planned and properly performed. Three 3.75mm diameter 9mm long Neodent® implants were installed, with 4.1 implant table and external hexagon connection. After 90 days of osseointegration of the implants, the healing devices were installed in the implants, where a further 10 days were expected for healing and prompt reestablishment of the gingival tissues around the implants, which allowed us to proceed with the case. Custom acrylic resin trays were made, using the open cutter for transfer of implants and the preferred material used was the addition silicone. In the next consultations, intermaxillary relations were taken, and the case was assembled in a semi-adjustable arcon articulator, followed by the wax teeth test and final acrylization of the work. The component of choice for retention of the lower prosthesis was the EQUATOR type, with a table of 4.1 and a height of 2mm (Neodent®),

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with 32N torque. The cylinders were coupled to the intraoral locator component for mouth-catching and using protective discs to prevent the entry of the acrylic resin at undesirable points in the connection and the finishing and polishing of the cylinders region.

## DISCUSSION

Treatment with 2-implant retained overdentures has been constantly reported in different types of studies in the world literature. The primary objective of these treatments is to be able to provide the lower edentulous patient with the use of a prosthesis with greater retention and thus improve important aspects such as chewing, speaking safety and consequently the patient's quality of life. For successful treatment and achieving these factors, the main feature overdenture must achieve is good prosthetic retention. In this context, some points are important to achieve this goal, such as: the distance between implants, the number of implants, the type of connection that will be used over the implant.



**Figure 1:** Neodent® components, Equator, Cylinder and plastic device for capturing in the mouth.



**Figure 2:** Relief in the prosthesis to receive the Equator Cylinder.

Treatment with lower overdentures in elderly patients is usually planned using 2 implants. The distance between implants is also a point discussed regarding prosthesis retention. The anterior mandible region, between the mental nerves, is the one selected for treatment. Distance between implants between 23mm and 29mm were studied by Shayegh *et al.* 2017, where reports a better prosthesis retention, with implants installed at a distance of 23mm, using the locator component as a retainer.



**Figure 3:** Occlusal view of implants with Equator Neodent® components.



**Figure 4:** Buccal view of implants with Equator Neodent® components.

The number of implants to be installed is also an important factor to consider regarding prosthesis retention. Oda *et al.*, 2017 studied the influence of the number of implants on mandibular overdenture movements, where they concluded that during chewing of the anterior teeth, where the use of 2 implants to anchor the overdenture increased the rotation of the prosthesis base more than using 1 or 3 implants. Horizontal movements were small compared to vertical movements, the movement of the prosthesis under occlusal force in the molar region was smaller than in the anterior region, and the rotational movement of the overdenture had a negative effect on the perceived masticatory capacity of denture wearers. It was concluded that rotational movement should be avoided to improve the quality of life of patients with edentulism. Beresford *et al.* 2018, compared treatments performed with two and three implants with Locator attachments and the impact on patients' quality of life, where they report better stability and retention in cases with three implants. El-Sheikh, 2012 compared for two years the use of 2 and 3 narrow diameter implants with the attachment locator in mandibular overdentures, where she concluded that the installation of more than two implants is not necessary. Prostheses supported by two implants are indicated mainly when cost is the most significant factor for the patient (Misch, 2000).



**Figure 5:** Final smile with the prosthesis installed.

Regarding the type of component used on implants to retain the prosthesis in the mouth, the most used are the ball type attachment and the locator type. Matthys *et al.*, 2019 compared the use of both Locator and Bola attachments, with two implants installed and with 5-year follow-up, where they reported that both components offered stable solutions, but with better retention for the Bola system. Cakarer *et al.* 2011, complications studies associated with overdentures prostheses with the bolla and locator system, where no significant difference was observed between the fixation systems in relation to implant failure, but the locator fixation was more advantageous than the ball systems in relation to complication rate in clinical practice. Cakarer *et al.*, 2010, also studied the two overdenture retention systems, where they observed that locator fixation was more advantageous for ball and bar systems in relation to the complication rate in clinical practice. Matths *et al.* 2019, followed treatments with overdentures retained by 2 implants, where both attachment types were used: ball type and locator type and concluded that both produce stable results in 5 years and improve quality of life related to the oral health of the patient, but reports that Locator attachments require more maintenance, although costs are minimal and result in lower retention. Tomas *et al.* 2018 studied the

Locator® (Zest Anchor, Escondido, CA) and Equator® (Rhein 83, Bologna, IT) devices, performing a 10-year follow-up where they remained clinically acceptable using two implants.

## CONCLUSION

Overdenture treatment with three implants using the attachment locator has been shown to be a viable alternative to provide increased prosthesis retention and patient satisfaction. However, further studies with long-term follow-up should be performed.

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