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Complete Removable Prosthesis Stabilized on Implants: Interest and Use of the Locator® Attachment

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Abstract **Case Series**

The complete removable denture retained by implants is a widely used therapeutic option, recognized for its functional and psychological esthetic rendering. Currently, the practitioner has an arsenal of retention systems at his disposal (axial attachments, anchor bars...) and since 2000, the Locator® attachment has been added to the large number of axial attachments. Thus, this article proposes to describe it and to expose, through two clinical cases, the process of its placement.

Keywords: Prosthetic rehabilitation, Clinical studies, Denture, Implants, Oral rehabilitation, Polymerization.

INTRODUCTION

Prosthetic rehabilitation of the edentulous patients, is still a challenge, especially in the presence of unfavorable anatomical conditions. In fact, complaints such as discomfort, lack of retention and pain are often expressed in the case of a conventional complete prosthesis, particularly in the mandible [1].

According to various clinical studies, stabilizing a complete denture by two implants can help to sustain the bone ridge, improve the satisfaction of the patients and contribute to their psychological wellbeing [2, 3].

In 2002, the McGill Consensus statement established a first-choice standard of treating edentulous mandible: overdentures supported by two Osseo-integrated implants [4].

An arsenal of attachment systems is available to ensure prosthetic stability and optimize patient comfort. The choice of these different types of implant-prosthetic connections will depend on their specific characteristics as well as the clinical situation. Locator® axial attachment is an additional retention method widely used in implant overdenture.

The aim of this paper is to present, through two clinical cases, the interest and the mode of use of the Locator® attachment in the treatment of edentulous patients with implants retained overdentures.

Description of the Locator Attachment System [5, 6] Fig 1

This is a cylindrical axial attachment compatible with many implant systems. It is composed of several parts:

- Locator® Abutment: female part (matrix) fixed at the implant connection covered with titanium nitride.
- Titanium box included in the prosthesis and it contains nylon inserts (male part). These resilient components adapt to angles between 0° and 10° and retention forces changes according to the color used blue, pink or white. Two special inserts (orange and green) compensates convergences between implant abutments from 20 to 40° are also available and their choice depends on the angle between implants.

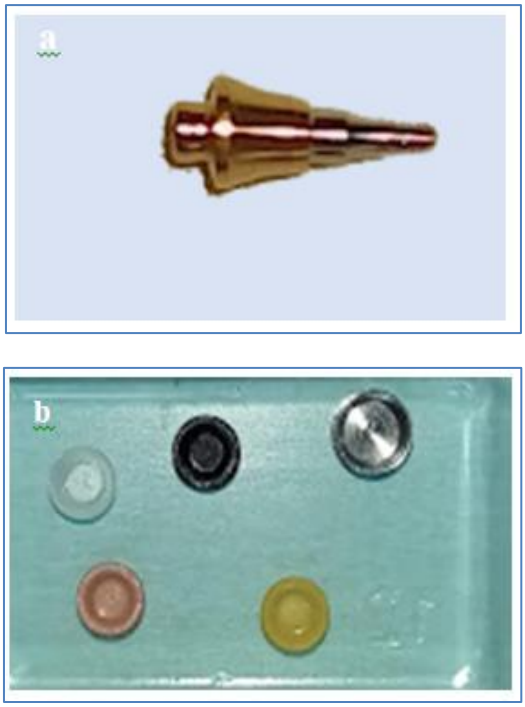

Fig. 1: Locator® attachement a: Locator® abutment b: Locator® inserts

FIRST CASE REPORT

A 56-year-old female patient in good health, totally edentulous, presented for oral rehabilitation with a functional and esthetic request.

Clinical examination revealed a resorbed mandibular ridge covered with thin, adherent fibromucosa and the presence of a flange inserted on the ridge, which compromised retention and prosthetic stability. Fig 2

Fig. 2: Completely edentulous maxillary and mandibular arches

A conventional complete denture was carefully fabricated according to the prosthetic balance requirements.

Although she was aesthetically and functionally satisfied with her maxillary prosthesis, the retention and stability of the mandibular prosthesis was judged insufficient by the patient. An implant solution was then proposed that consisted of stabilizing the mandibular prosthesis with two Locator® attachments supported by two symphyseal implants.

After discussing the risks, benefits and treatment alternatives, the patient chose the proposed treatment plan. The well-made prosthesis in use is the ideal master to prefigure the prosthetic project, validate the available prosthetic space and preview the final esthetic result.

This prosthesis was duplicated in transparent resin to serve as a radiological guide. The envisaged implant sites were marked on the guide with 2 mm diameter perforations filled with a radiopaque material (gutta-percha) [7].

A CBCT was performed with the radiological guide in place. Reading the cone beam allows analysis of the quality and volume of bone available at the implant sites and selection of the implant diameter and length according to the available bone volume, taking

into account the anatomical obstacles at the site. Two implants (3.5mm*10mm) were placed in the canine sites (43, 33). A panoramic radiograph was taken at 3 months to verify osseointegration, positioning, and axes of the implants. Fig 3

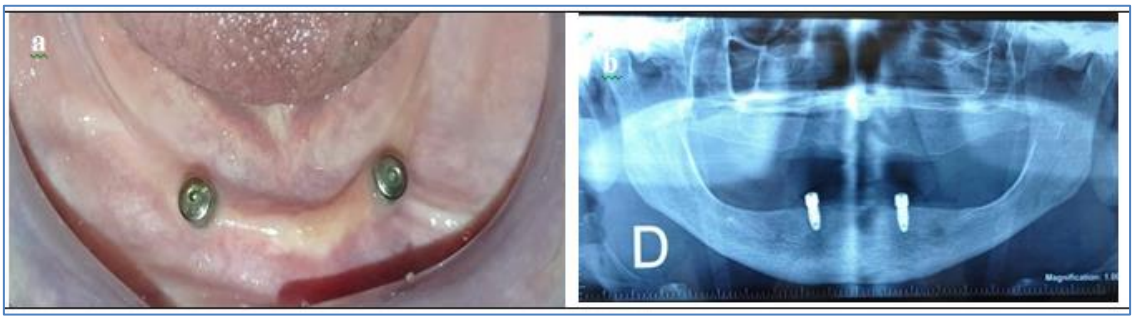

Fig. 3: a: Healing screws in place b: Control panoramic radiograph

The Locator® was placed using the direct technique in several steps.

After removal of the healing screws, the transmucosal height was measured with a periodontal probe to select the appropriate Locator® abutment.

The Locator® abutment should have an emergence of 1mm to avoid compromising retention and to maintain the health of the peri-implant gingival tissues [1]. The abutments were then screwed to the implant and tightened with a torque wrench to 25-30Ncm [5]. Fig 4

Dyke squares were placed to protect the abutment and the peri-implant biological space from any risk of resin flowing into these areas. The box with the black collar sheath is placed above the abutment. Fig 5

The intrados of the prosthesis were hollowed out corresponding to the attachment abutments. A Light silicone was used to precisely define the areas that interfered with the Locator® attachment. Fig. 6

A chemically polymerizable polymethylmethacrylate resin is prepared to fill the inner surface base, then the prosthesis is placed in the mouth under occlusal pressure until the resin is completely cured. Fig 7

Fig. 4: Insertion of the Locator Abutment

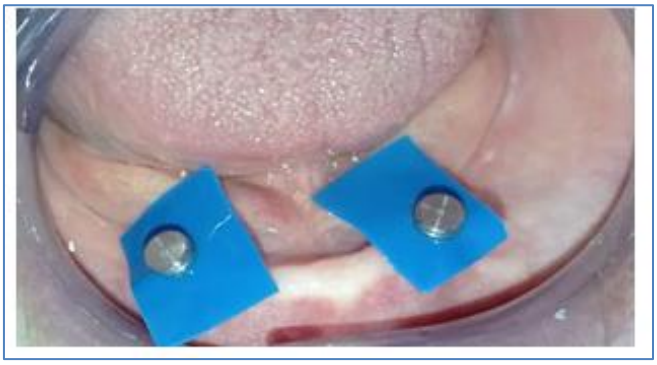

Fig. 5: Installation of dikes and boxes on Locator's abutments

Fig. 6: *E*mptying interior surface base: use o f a light silicone to specify areas that interfere with the Locator®'s box

Fig. 7: Auto-polymerizing resin placed in the interior surface base

After polymerization, the excess acrylic is removed and the denture base is finished. The black sheath is removed and replaced with a yellow retention. Fig 8, 9

The patient is instructed on hygiene to maintain peri-implant health. The prosthesis is delivered to the patient for a few months and the retention can be gradually increased with a more retentive insert.

Fig. 8: Place the yellow inserts

Fig. 9: Final result

SECOND CASE REPORT

A 45-year-old healthy female wearing a conventional upper full denture presented for consultation. She complained of chewing difficulties due to instability of the maxillary total prosthesis.

Clinical examination revealed a completely edentulous maxillary arch and a class I Kennedy-Applegate mandibular arch.

The prosthetic decision was an implant-supported maxillary overdenture using the Locator® attachment and a removable mandibular partial denture. Four implants were placed (3.5mm*10mm).

After removing the healing screws, insertion the Locator® abutments. Place the square glove to avoid any risk of resin flowing into the peri-implant biological space. The box, with the black gain, was placed above the abutment. Fig 10

An autopolymerizable resin is prepared to fill the internal surface base. The prosthesis is placed in the mouth under occlusal pressure until the resin is completely cured.

After polymerization, the excess acrylic is removed and the denture base is finished. The black gain is removed and replaced with the selected retention gain. Fig 11, 12. Hygiene instructions are given to the patient and control visits are scheduled.

Fig. 10: Placement of the Locator® attachment
(a) Removing the healing screw
(b) Locator Abutments Screwed
(c) Installation of Spacer Gloves and Boxes on the Locator Abutment

Fig. 11: Interlocking the male part to the prosthesis

Fig. 12: Final result

DISCUSSION

Implant supported dentures are considered one of the best options for replacing missing teeth.They offer several advantages over conventional complete dentures, including low cost, improved retention and stability, enhanced chewing efficiency, and preservation of the jaw bone**.** Various types of attachment systems are available, and their choice depends on the clinical situation such as the degree of resorption, the quality of the bone, the prosthetic space...

The Locator® is a good alternative to ball attachments and connecting bars. In fact, it is easy to use and requires little clinical time with a relatively simple protocol [8]. The reduced height of this attachment is advantageous in cases with limited

interocclusal space [9]. In addition, its use maintains a better peri-implant tissue health, comfort and patient satisfaction [10]. In case of divergence of axes: The self-aligning feature of the locator attachments reduces the risk of premature wear of the attachments.

It compensates for implant non-parallelism up to 40°. This is important because it generates less stress and allows atraumatic distribution of occlusal forces to the underlying bone support [11]. Locator attachments provide dual retention, one is mechanical and one is frictional with the ability to change retention sleeves [12]. In addition, retention is progressive and can be adjusted according to the clinical situation and patient dexterity [1].

Although the literature has shown long-term benefits of locator attachment, several disadvantages have also been reported, including the risk of nylon sheath degradation with loss of retention, as well as cases of prosthetic base fracture and loss of prosthetic fit. Furthermore, it was noted that the problem of food accumulation in the female part of the abutment, compromises the complete insertion of the prosthesis. This disadvantage is most apparent in elderly patients with limited manual dexterity due to the difficulty of the cleaning maneuver [13]. It is therefore essential to educate patients about the importance of their role in rigorous daily biofilm control and elimination. In addition, sheaths must be regularly inspected and replaced by the practitioner when necessary.

CONCLUSION

The Locator® is an interesting retention device for complete implant-retained dentures. It has many advantages over other available systems and can be used in different clinical situations. The appropriate choice of its size, as well as the protocol for its placement, is essential to know for any clinician performing this type of rehabilitation.

Maintenance is an important parameter to include in the treatment plan, as it allows for longevity of the retention achieved, preservation of the denture bearing area, peri-implant health and long-term patient satisfaction.

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