The Use of Locator® Attachments for Implant Retained Overdenture: About Two Clinical Cases

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ABSTRACT

Implant retained overdenture is a frequent therapeutic option recognized for its functional and psychological aesthetic rendering. It uses retention devices such as axial attachments or anchor bars. The Locator® axial attachment is one of the most used means due to its simplicity and multiple advantages. Thus this article proposes to describe it, and expose through a two clinical cases the process of its placement.

KEYWORDS

Implant retained overdenture, Attachments Locator®.

INTRODUCTION

Edentulous patients often experience problems with their conventional dentures resulting from lack of stability and retention on the alveolar process, especially in the mandibular arch.[1] Multiple clinical studies reported that overdenture prostheses for edentulous mandible have been shown to improve quality of life, the chewing ability and the satisfaction of this category of patients and significantly contribute to their psychological wellbeing. In addition, the remaining residual bony ridge will be preserved.[2]

In 2002, the McGill Consensus statement established a first-choice standard of treating edentulous mandible: overdentures supported by two Osseo-integrated implants.[3]

Several types of connections between the implant and the prosthesis are used. These attachments systems varied by their shape, retention mode. They include splinting (bar-clip construction with various bar shape designs) and non-splinting attachments (ball, magnets, Locators, and telescopic crowns).[4]

The ball attachments are frequently used due to their ease of implementation and access to hygiene in comparison with the bar attachments. In addition, the complications are easy to manage and they have a lower cost.[5-7]

However, some conditions could interfere with its indication such as the non-parallelism of the implants or the lack of vertical prosthetic space. The Locators attachments, due to their angulation and lower crowding can resolve these problems.[4]

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

Presentation of the Locator Attachment System:[8] **(Fig. 1)**

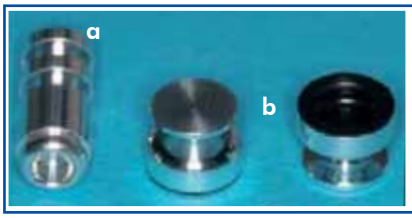
(Fig. 1)
Locator® attachment

- *Male part*: in titanium, screws directly onto the implant with a screwdriver **(Fig. 2)**
- *A titanium capsule*: to be integrated in the prosthesis
- *Polyethylene gain*: with different colors, angulation and retention degree:
  - *Black gain*: non-resilient, is used during laboratory steps
  - *Transparent*: present a high retention with an angulation from 0 to 10°
  - *Pink*: present a slight retention with an angulation from 0 to 10°
  - *Blue*: present a very light retention with angulation from 0 to 10°
  - *Green*: with a strong retention ande angulation is up to 20°
  - *Red*: with a very low retention and angulation up to 20°

(Fig. 2) *Locator® abutment*

The polyethylene gain integrated in the titanium capsule forms the female part (matrix)

- *White disk*: in Teflon, to prevent acrylic resin rocket around the abutment when the capsule is attached to the prosthetic base. **(Fig. 3)**
- *Pillars replicas*: with 4 and 5mm of diameter for the laboratory steps
- An impression transfer with black Patrice
- The two letters' components are used of the indirect technique



(Fig. 3)
a: *the pillars replicas*
b: *the impression transfer*

The manipulation of this locator attachment should be done using a triple action wrench:

- A telescopic end for the deposit of the gain in its titanium capsule. **(Fig. 4a)**
- A cylindrical end for the insertion of a new male part. **(Fig. 4b)**
- A golden end to insert and screw the abutment in the implant. **(Fig. 4c)**

FIRST CASE REPORT

A 62-year-old healthy non-smoking man presented for restorative consultation regarding his failing maxillary dentition. His main complaint was a lack of comfort during function and not being able to smile due to his poor esthetics.

(Fig. 4) *Locator® core tool*
a: *Extraction component*
b: *Insertion component*
c: *Abutment placement component.*[8]

The clinical examination revealed a completely edentulous maxillary arch and Class I kennedy-appelgate mandibular arch. **(Fig. 5 a,b)**

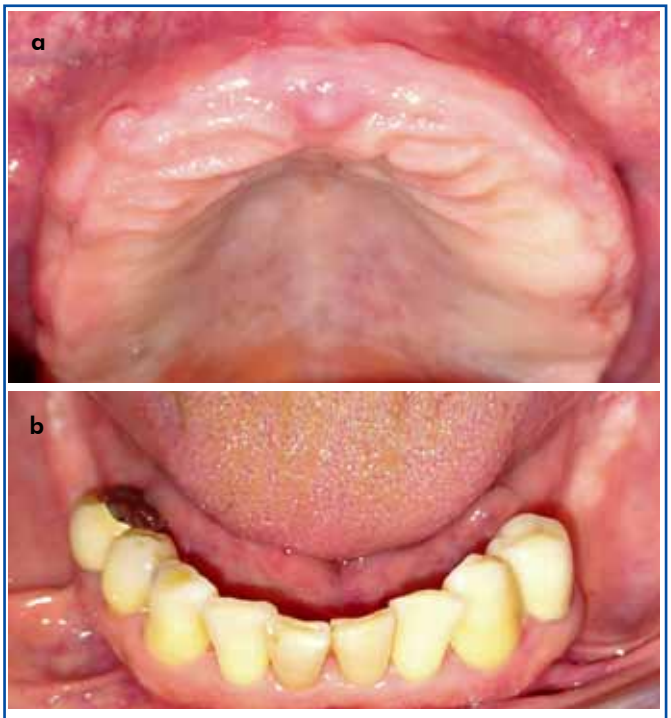
The analysis of the study casts mounted on articulator showed a sufficient prosthetic space with a correct occlusal plan.

The prosthetic decision made was an implant retained maxillary complete overdenture and a mandibular removable partial denture.

CLINICAL STEPS

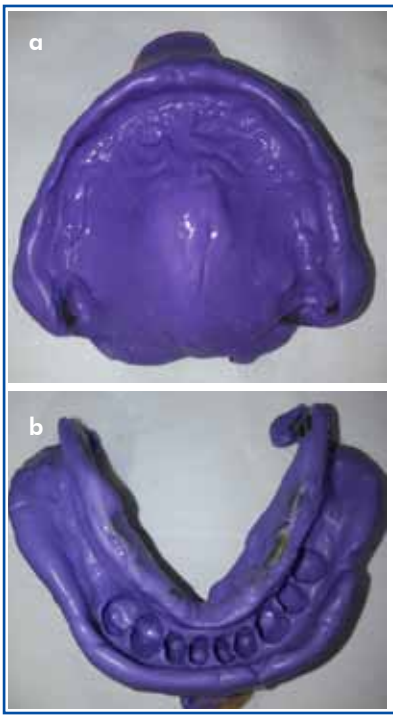
Prosthesis Fabrication:[4]

Preliminary impressions were made for both maxilla and



(Fig. 5) a: *Completely edentulous maxillar arch*
b: *Class I mandibular of Kennedy-Appelgate*

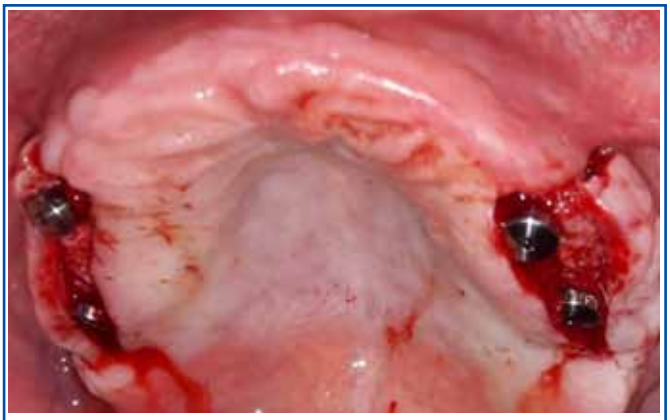
mandible. Custom trays were made with the obtained study casts. The secondary impressions were performed for the maxillary arch using silicone material **(Fig. 6)**. Jaw relation, articulation, teeth arrangement and try-in were done sub sequent to the retrieval of master casts.



(Fig. 6)
a,b: *Secondary impressions*

Implant Surgery:[9]

A CBCT was done with a radiological guide in place. Four implants were placed: two implants 4.1mm x 13mm (15-25) and two implants 4.1mm x 11.5mm (17-27) **(Fig. 7)**. The prosthesis was repacked with soft resin (*Fitt de Kerr*) and changed periodically during osseointegration.



(Fig. 7) *Four implants placed*

A radiographic evaluation was performed after four months. It indicated satisfactory implants osseointegration and showed an implants axes' divergence of 20°. **(Fig. 8)**

In this case ball attachments could not be used because they don't tolerate more than 10° of axes divergence.

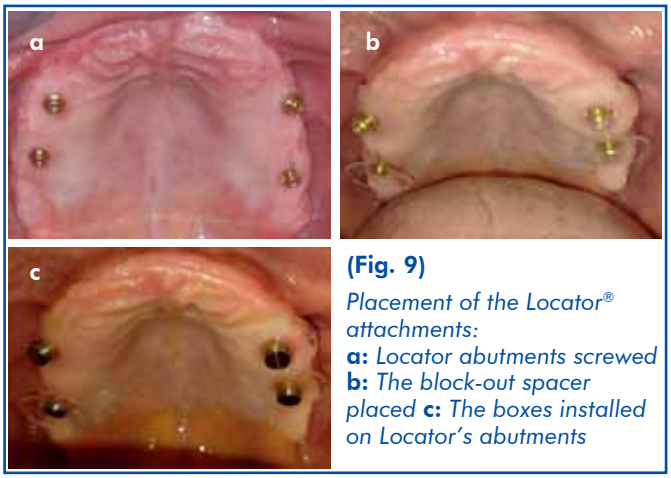
(Fig. 8) *Control panoramic radiograph*

The bar-clip attachments could be used but it was refused by the patient due to its crowding. While Locator attachments tolerate axes divergence up to 40°. For these reasons, the attachments Locators were used.

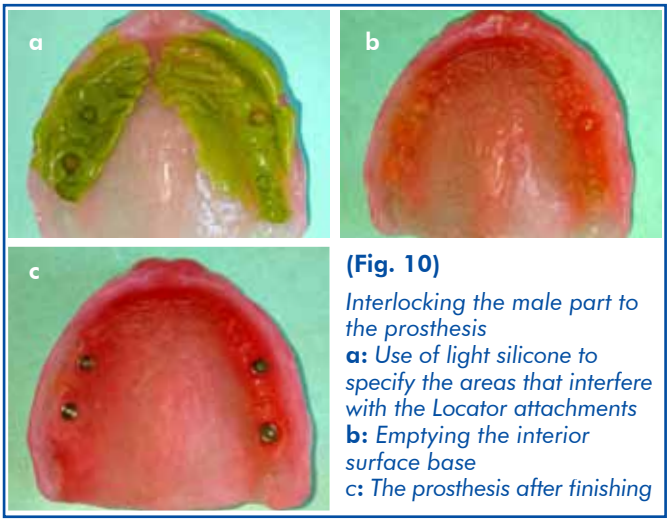
Setting-up of the Attachments:

The direct technique was used instead of the indirect procedure to avoid the errors in clinical impression and laboratory techniques. After removing the healing screw, the transmucosal heights were measured with a periodontal probe and the appropriates Locator abutments were chosen. The Locator abutments were positioned then tightened using a torque wrench through the hexagonal connection. **(Fig. 9a)**. The block-out spacers were inserted around locator abutments to prevent acrylic resin from flowing into undercuts. **(Fig. 9b)**. The titanium caps were placed with the black nylon inserts **(Fig. 9c)**.

The underside of the prosthesis was recessed facing the abutments to avoid any interference with the prosthetic base. **(Fig.10. a,b)**. After polymerization under occlusal pressure, the prosthesis was removed. The bock-out spacers were removed and the prosthetic base was finished. **(Fig. 10c)**. Then the black nylon capsules were replaced by final retentive inserts which its color chosen according to the desired retention intensity and adapted to the clinical situation. It is important to check the occlusion and to show the patient how to insert and remove the prosthesis.



(Fig. 9)
Placement of the Locator® attachments:
a: *Locator abutments screwed*
b: *The block-out spacer placed* **c:** *The boxes installed on Locator's abutments*



(Fig. 10)
Interlocking the male part to the prosthesis
a: *Use of light silicone to specify the areas that interfere with the Locator attachments*
b: *Emptying the interior surface base*
c: *The prosthesis after finishing*

(Fig. 11) *Final result*

SECOND CASE REPORT

A 65-year-old healthy male patient wearing complete upper and lower conventional prosthesis presented for oral rehabilitation. He complained of difficulties during mastication, due to the instability of the mandibular complete prosthesis.

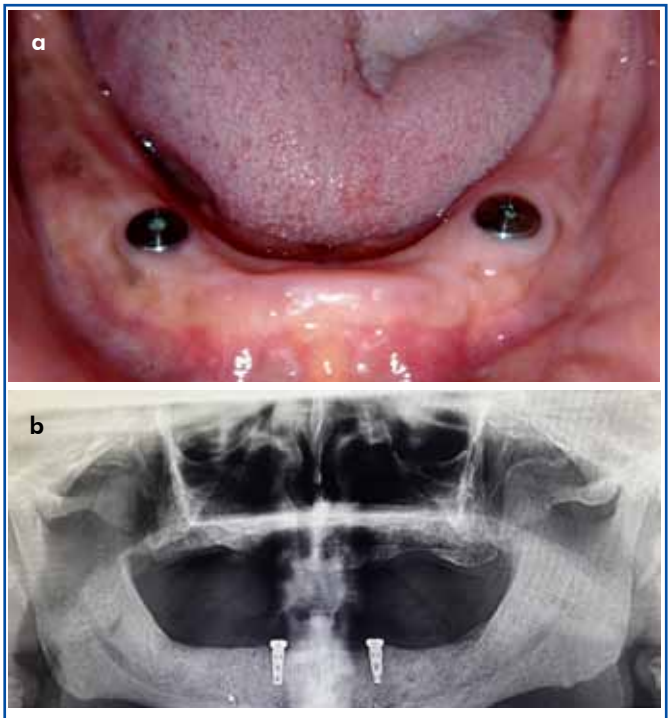
Clinical examination revealed a completely edentulous maxillary and mandible arches: the mandibular arch is resorbed.

The analysis of the study casts mounted on articulator showed a reduction of the prosthetic space.

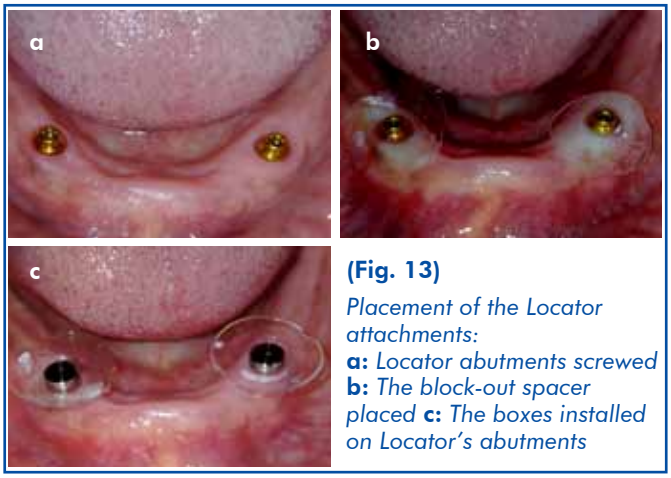
The prosthetic decision was two implants supported complete mandibular prosthesis with the use of Locator attachments. **(Fig. 12a,b)**

Two implants were placed (33-43) 3.75mm x 10mm. After removal of healing screws, insertion of Locator® abutments. **(Fig. 13a)**

Installation of the block-out spacer provided by the manufacturer to avoid any risk of resin's flowing into the peri-implant biological space. **(Fig. 13b)**



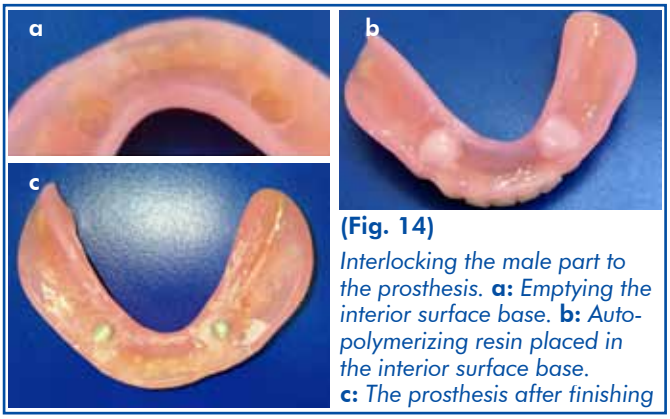
(Fig. 12) a: *Healing screws in place*
b: *Control panoramic radiograph*



(Fig. 13)
Placement of the Locator attachments:
a: *Locator abutments screwed*
b: *The block-out spacer placed* **c:** *The boxes installed on Locator's abutments*

The box, with the black gain, is placed above the abutment. **(Fig. 13c)**

An auto-polymerizable resin is prepared to fill the interior surface base **(Fig. 14 a,b)**. Prosthesis is placed into the mouth under occlusal pressure until the resin has completely cured after polymerization, acrylic excess is removed and the denture base is finished. The black gain is removed with the extractor and substituted by a chosen retention gain using the male seating tool. Hygiene advice is given to the patient. The prosthesis is delivered to the patient for a few months and retention can be improved using a more retentive insert.



(Fig. 14) *Interlocking the male part to the prosthesis.* **a:** *Emptying the interior surface base.* **b:** *Auto-polymerizing resin placed in the interior surface base.* **c:** *The prosthesis after finishing*

(Fig. 15) *Final result*

DISCUSSION

Literature abounds in favorable evidences that an implant retained overdenture excels conventional complete denture, improving retention, stability, chewing efficiency and preserving the residual bone, implying less frequent need for relining and rebasing procedures.[10]

In case of divergence of axes: the self-aligning of Locator attachments reduces the risk of premature wear of the attachments.[8]

The setting-up of Locator attachments is easy and requires little clinical time with a simple protocol comparing to the bar-clip attachments that demands more dexterity of the patrician and more laboratory steps. It has the advantage over connecting bars and ball attachments of being used in cases of reduced prosthetic space.[11]

As retention is one of the most important characteristics, Locator offers double retention (internal and external) for conventional inserts transparent, pink and blue. Externally, using an undercut against the periphery of the abutment and internal axial cavity type snap.[8]

Compatibility with a Multiple Implant's Systems

- A non-rigid connection to the implant: the replacement of insert which is in static contact with the abutment, while the titanium cap in the resin of the prosthetic base allows a rotational movement, so that the forces can be absorbed without losing retention.[8]
- Easier maintenance than ball attachements.
- The long-term success rate of implant-retained overdentures depends of multiple factors, among others, quality and quantity of residual bone, the appropriate choice of retention means and the quality of prosthetic restoration.[12-13]
- To optimize the choice of attachment systems, it is necessary to take into consideration the characteristics of each available attachment which is related to the clinical situation.

Therefore, the pre-implant analysis must be carried-out meticulously.

CONCLUSION

Locator attachments were found more advantageous than others attachments systems regarding complications in clinical practice.

They are self-alignment attachments during insertion, resilient, retentive, low profile and offer built-in angulation compensation. In addition to higher rate of maintenance than others attachments systems.

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