



April 2018

Published by Global Dental Implant Academy

GDIA

Dental Implant CASE REPORT

The Use of Lingual-Locking Screws or the Multi-Unit Abutments as Prosthetic Solutions to Misaligned Placed Implants.



Tony Daher, DDS, MSED, FACP, FICD.

- Co-director of GDIA.
- Diplomate American Board of Prosthodontics
- Private Practice limited to Prosthodontics, La Verne, California, USA

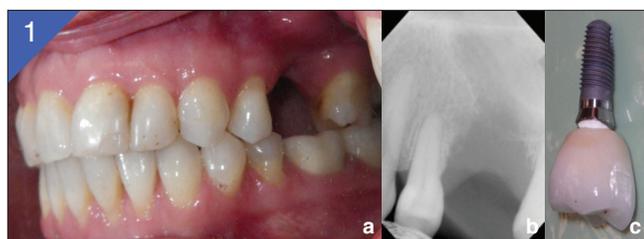


Figure 1a-c. Excess cement left behind after a cementation procedure, can be very difficult to remove and may cause bone loss and eventually the loss of the implant.

Introduction

Successful implant restoration is depending on an adequate surgical and prosthetic protocol. The dental implant should be placed in an optimum position according to the predetermined prosthetic restoration.

A Screw-Retained Implant Crown (SRIC) is mostly desirable when possible.⁴ When an implant is not

adequately placed, and the access hole does not end up in the middle of the occlusal surface or to the lingual of the incisal edge, an implant cement-retained restoration is commonly indicated. Residual excess cement after placement of single or fixed partial dentures has been associated with clinical and radiographic signs of peri-implant disease in 81% of the cases⁴. (Figure 2) During the cementation of such restorations, it was demonstrated that a risk of leaving excess cement behind in the implant gingival cuff exists⁴.

In the last few years an increase in Peri-Implantitis has been attributed, in part, to the excess cement left around the implant collar and threads, leading in many cases to bone loss and even the complete failure of the implant treatment.^{1,2,3,4,5} (Figure 1)

This case report article will describe the use of lingual-locking screws and the straight and angulated multi-unit (MU) or Octa-type abutments as an alternative to cement-retained implant restorations.



Materials & Methods

The lingual-locking screws for implant-retained restorations.

The advantage of implant-borne screw-retained prostheses is the ability to retrieve it. The removal of cement-retained implant crowns has often proven difficult due to a multitude of variables, including locating the access and stripped screws and safeguarding the underlying custom abutment. To facilitate its removal, Daher et al⁶ described a technique where photos of the abutment are made before cementing the crown over. These photos (Figure 2) are kept in patient chart to help locate the access hole and retrieve the restoration when it is needed⁶. A better way that it is available to the practicing dentist is the use of a vertically or horizontally secondary screw to lock the implant crown superstructure to the implant abutment. The concept of a secondary locking horizontal screw⁸ or the cross-pin⁷ at the crown level allows latitude in fixture position, good aesthetics, and especially retrievability. (Figure 2)



Figure 2a,b. Photos of the abutment are made before cementing the crown over. These photos are kept in patient chart to help locate the access hole and retrieve the restoration when it is needed at a later time.

The technique of lingual set screw is well described at www.preat.com. The cross-pin technique is described in the article of Gervais MJ et al⁷.

The general principles in using either technique, are as follow:

1. These screws are smaller than the abutment screws and not able to withstand occlusal forces without the abutment protection. Designing the abutment in a manner to provide optimum resistance and retention form is a must. This provides protection to the lingual screws against destructive shearing forces.

2. The lab technician must provide a lingual location with an easy clinical access for the placement of the lingual screw. For example, the cingulum area of the anterior teeth, the lingual surfaces of the maxillary and mandibular premolars and maxillary molars and mesio-lingual angle of the mandibular molars due to the position of the tongue.

3. It is imperative to establish the final shape of the prosthesis early for proper abutment design and contour. This can be established by providing a full contoured wax patterns of the final restoration on a cast or digitally on a computer.

4. A medical silicone or just a light viscosity polyvinyl siloxane is used to seal the space between the crown and the abutment during placement procedure. This will prevent any seepage of food in that space. Then the lingual screw(s) will secure the prosthesis to the abutment(s).



Figure 3a-d. The clinical situation before implant prosthesis restoration. a) 5 implants were placed and integrated. b,c) Acrylic interim removal partial denture in patient's mouth. d) Frontal view of the interim fixed partial denture (FPD) in patient's mouth. This interim FPD is the blueprint of the final fixed implant restoration after being modified and accepted by the patient.





Figure 4a-k. Lingual set of screws on a 6 units prosthesis for a clinical situation. a) 6 units of screw-retained prosthesis with 3 sets of lingual screws. b) Lingual view of the prosthesis. c) Lingual view of corresponding CAD-CAM abutments. d) Frontal view of the abutments in patient's mouth. e) The abutment access holes are plugged with light viscosity polyvinyl siloxane (PVS). f) The prosthesis is filled with the same PVS and placed over abutments and the 3 sets of lingual screws are tighten in. g,h) Different views of the prosthesis. i) Anterior guided articulation of the final prosthesis. j) Smile views of the final prosthesis. k) Frontal view of the prosthesis after 10 years.

The use of multi-unit (MU) or Octa-type abutments to overcome misaligned implants.

When multiple implants are misaligned in the posterior quadrants (Figures 5, 6) or during restoration of a complete arch (Figure 6), multi-unit (MU) abutments, straight or angulated could be used to overcome the misalignment by moving the implant internal connection to a taper external connection and render the restoration screw-retained. By using such abutments, the occlusal stress will be moved from the implant screw to the MU abutment small screw. In case of the prosthesis small screw breaks, it is easily replaced and even the MU abutment can be removed and replaced with a similar size. The same prosthesis is placed back over. These abutments can be either straight or angulated types are used especially for 4-implant screw-retained prosthesis concept. (Figure 6)



Figure 5a-c. Multi-Unit (Octa) abutments for a partially edentulous situation. a) 2 DENTIS™ Multi-Unit Octa type abutments. b) 3 Implant connected screw-retained crowns over octa type abutments. c) Occlusal view of the prosthesis in place.

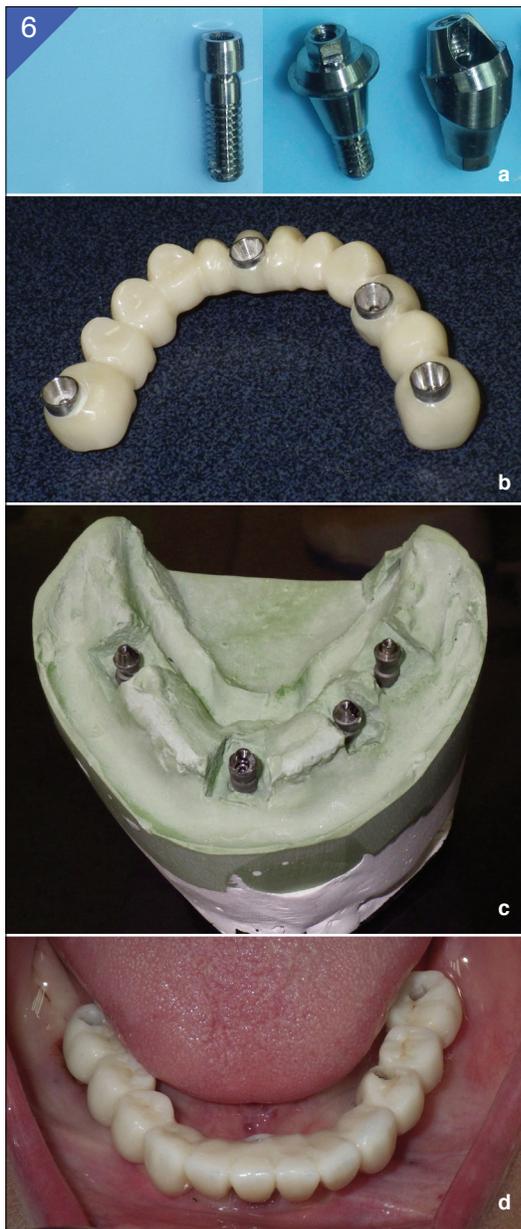


Figure 6a-d. a) Photo of a straight and angled MU abutments (www.dentisusa.com). b,c,d). 4-implant mandibular screw-retained prosthesis using straight and angulated multi-unit abutments to composite the misaligned implants.

Summary

The ability to retrieve a restoration is often cited as an advantage of screw-retained prostheses. This case report article described the use of lingual-locking screws and the straight and angulated multi-unit (MU) or Octa-type abutments as an alternative to cement-retained implant restorations when the implants are misaligned.

Conflict of interest:

The author declares no conflict of interests relating to this article.

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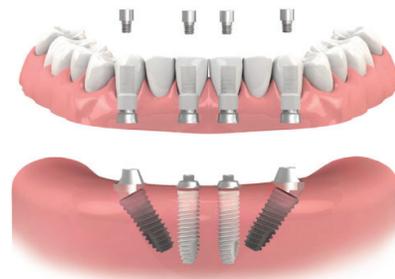
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6 Centerpointe Dr. #600, La Palma, CA 90623
T: 323-677-4363 | F: 323-677-4366 | E: info@dentisusa.com

