

# A Technique for Removal of a Fractured Implant Abutment Screw

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The aim of this technique report was to present a procedure for removal of a fractured implant abutment screw. Whatever the cause, when an abutment fracture has occurred, the fractured screw segment inside the implant must be removed. The methods used by the clinicians may include the use of an endo-explorer self-made screwdriver and the use of implant repair kit available for some implant systems. The advantage of the presented method is that it may be extended to other implant systems that do not have a special repair kit and also that the technique is simple and does not require special equipment.

**Key Words:** *abutment screw, remove, fracture, dental implant*

## INTRODUCTION

**T**he rehabilitation of the stomatognathic system by implant-supported prostheses aims to reestablish the function of this system, preserve the dental structures, and provide longevity to the treatment.<sup>1</sup>

Although implant-supported prostheses have become a very successful treatment for completely and partially edentulous patients, some complications may occur that can lead to failure of implant-supported prostheses. These complications may include loosening or fracture of the prosthetic screw, loosening or fracture of the abutment screw, and implant fracture.

Defects in implant design or material, poor design, nonpassive fit of the prosthetic framework, physiologic or biomechanical overload, occlusal trauma, and undetected screw loosening, which can be due to bruxism and malfunction, may cause these complications. The abutment screw can also fracture by fatigue.<sup>1-6</sup>

Screw-joint stability involves a number of critical factors, with 3 of the most important being (1)

adequate preload, (2) the precision of the fit of the mating implant components, and (3) the basic antirotational characteristics of the implant-to-abutment interface. Application of the correct torque to an implant screw is translated into a preload that holds the components together.<sup>4</sup>

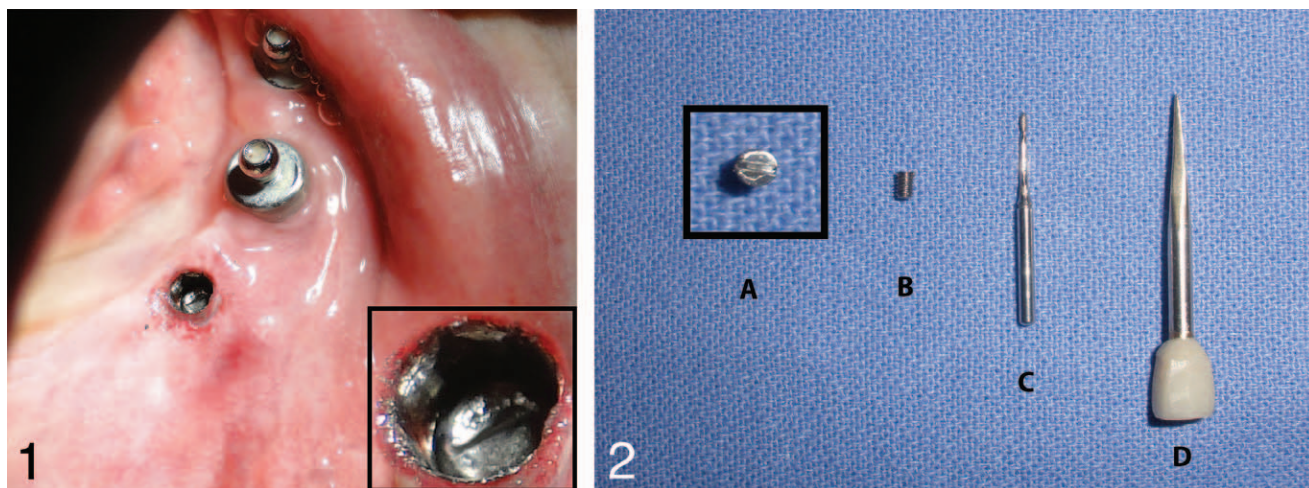
Whatever the cause, when an abutment fracture has occurred, the fractured screw segment inside the implant must be removed. Otherwise, the implant may remain osseointegrated but will lose its ability to retain the prosthesis, so that the existing prosthodontic restoration can no longer be used.<sup>7</sup> The aim of this technique report was to present a procedure for removal of a fractured implant abutment screw.

## CASE REPORT

A 54-year-old female patient with complaints regarding her lower implant-supported overdenture was referred to our department of prosthodontics. Clinical examination showed that the screw of one of the ball attachments in the area of the mandibular right canine was fractured, and the apical part of the screw remained threaded into the implant (Figure 1). After consultation with the patient, it was decided that the fractured screw should be removed, and the new ball attachment was restored.

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**FIGURES 1 AND 2.** **FIGURE 1.** Fractured abutment screw in implant. **FIGURE 2.** (a) The magnified occlusal view of the removed screw. (b) Removed fractured screw. (c) Modified flame shade bur. (d) Handmade screwdriver.

Primarily, a flame-shaped bur (Komet, Gerbr. Brasseler GmbH, Lemgo, Germany) was modified to prepare a groove on the fracture screw. The diamond particles of the upper part of the flame-shaped bur was removed and polished in order not to damage the internal screw thread of the implant (Figure 2c).

A thin groove was created on the screw piece, which remained in the implant with the modified flame-shaped bur by using a dental loop (Keeler 2.5 x Dental loop, Keler Ltd, Windsor, England).

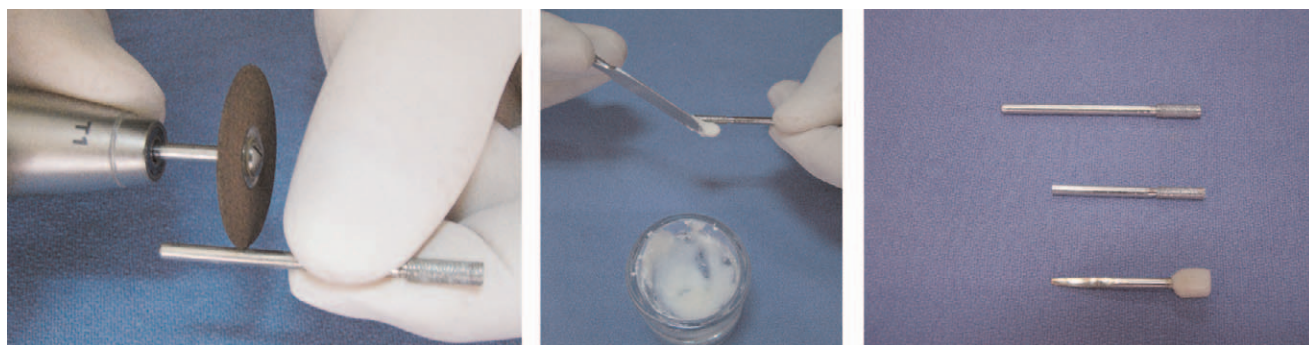
Then, a handmade screwdriver was prepared from a detrited tungsten carbide bur (Figure 2d). The upper part of the bur was cut to the desired length. The tip of the bur was made thin (1.5 mm in width) and sharpened as a screwdriver with a carbon separating disc. An angular-shaped handhold was made from autopolymerizing acrylic resin (Schutz Weil-Dental GmbH, Rosbach, Germany) to hold and rotate the screwdriver easily (Figure 3).

The handmade screwdriver was positioned onto the groove that was prepared on the fractured screw in the implant and slowly rotated counter-clockwise. When the fractured screw was loosened completely, it was removed with a dental pincer. The new ball attachment was then placed and torqued (Figure 4).

### DISCUSSION

Methods for retrieving screw fragments with the implant in situ have been reported. These methods used by the clinicians may include the use of an endo-explorer self-made screwdriver and the use of implant repair kit available for some implant systems.<sup>5,7,8</sup>

If the screw stump is not under any pressure and is just sitting in the mated threads loosely, it may be possible to remove the screw by rotating with an endo-explorer or a dental probe. However,



**FIGURE 3.** The preparation of the handmade screwdriver.



**FIGURE 4.** The new ball attachment placed on the implant.

when the screw stump is jammed, using an implant repair kit or a handmade screwdriver may be more useful.

### CONCLUSION

The advantages of the presented method include that it may be extended to other implant systems that do not have a special repair kit and that the technique is simple and does not require special equipment.

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