

MANAGEMENT OF A FRACTURED IMPLANT ABUTMENT SCREW - A CASE REPORT

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Abstract

In an abutment - implant fracture, it is generally a challenge for the clinician to remove the fractured fragments. A fractured abutment screw of a single crown or fixed dental prostheses supported by an endosseous implant is a complication. In some cases, the screw cannot be removed, and alternative solutions should be considered. This clinical report describes a fractured abutment screw prostheses and cold welded screw, which was impossible to retrieve.

Keywords: Dental implant, Implant abutment screw fracture, over load, Implant abutment screw retrieval

Introduction

Dental implants are an effective, reliable, and predictable prosthodontic treatment option for partially and completely edentulous patients.^{1,2} Despite a high success rate of 97% to 99%,^{3,4} technical and biological problems may be encountered. Biological complications include peri-implant radiolucencies, peri-implantitis, and radiographic signs of loss of osseointegration. Technical complications include loss of retention, screw loosening, and fractures of porcelain/

framework/screws.⁵

Abutment screw fracture is an uncommon (range from 0.5% to 8%)⁶ but challenging the technical complication in implant-retained restorations and may occur due to bruxism, unfavorable superstructure, overloading, malfunction, premature occlusal contacts, metal fatigue after screw loosening, and component misfit.⁶⁻⁹

Dental implants have been a life enhancing modality for partially and completely edentulous patients. Implants can successfully support a cemented or screw retained single crown. However, this modality is not without complications. A fractured abutment screw may occur after the prosthesis is under functional cyclic loading. The abutment screw may be overloaded and fracture leaving the abutment and coronal screw fragment inside the abutment/crown and the apical fragment in the fixture itself. Abutment screw fracture is a rare event, occurring less than 0.5 %.¹⁰

Occlusal loading is a multi-directional and variable magnitude force. Even though an integrated implant transmits the load to the surrounding bone, the load is transmitted through the abutment and its retaining screw. The abutment screw will

receive tensile and bending moments that can induce a fatigue fracture.^{10,11}

There are several techniques for managing a fractured abutment screw. These include removal and retreatment of screw and prostheses, followed by re-fabrication, screw fragment retrieval and other techniques.^{12,13} Many but not all implant companies offer fracture screw removal kits but they are expensive and do not consistently remove the fracture segment. Case reports and a technique for abutment, fragment retrieval and crown-abutment separation and re-cementation of the crown and over-denture retainer fracture are discussed herein.

Clinical report

A 25 year old male patient reported to the Department of Prosthodontics, with the chief complaint of loosening of implant crown prostheses

in lower posterior region. Past dental history revealed that patient had undergone implant placement in lower left back tooth region 3 years before with screw retained prostheses. On intraoral examination, there was a fractured abutment screw in 36 region and screw loosening in 37 region (Fig 1). RVG revealed fractured implant abutment screw in 36 region with well osseointegrated implant (Fig 2).

The screw retained crown prostheses is removed and the fractured screw was removed by using ultrasonic scaller tip. (Fig 3)

After the removal of prostheses, gingival former was placed on 36 and 37 region to guide the healing of soft tissue. (Fig 4).

Impression copings was placed and closed tray impression were made for the fabrication of new abutment screw with the same existing crown prostheses (Fig 5).

The new screw retained prostheses was fabricated with the existing crown and the fit was checked intraorally along with occlusion (Fig 6). The access hole of final screw retained prosthesis was filled with putty material and flowable composite resin. RVG is made to check the accurate fit of the abutment screw and implant fixture (Fig 7).

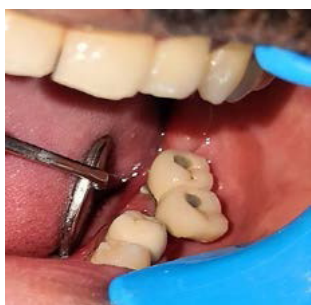


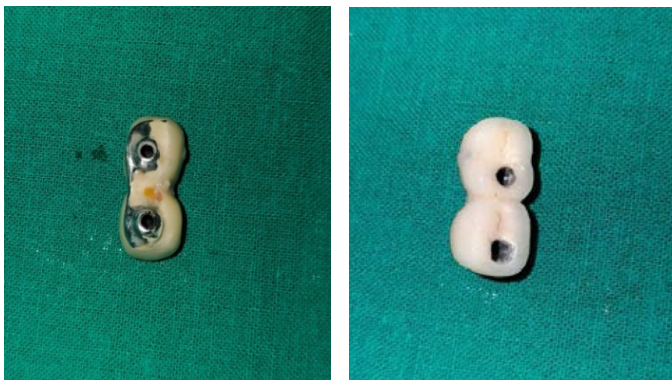
Fig. 1 - Fractured abutment screw



Fig. 2 - RVG reveals fractured screw in 36



Fig. 3 – Removal of screw and prostheses



Discussion

A common complication of implant prosthetics is with components. The abutment screw connects the abutment to the fixture and can fracture

under occlusal functional load. In preparation for treatment of a patient presenting with an abutment screw fracture, a radiograph should be taken to insure osseous support quality of the supporting implant. In this case report, the fractured implant abutment screw is managed by use of simple method by using ultrasonic scaler tip. The conservative approach in the management of abutment screw fractures is to retrieve the fractured screw to facilitate the reuse of the implant. When an abutment screw fractures above the implant body, the fractured screw is grasped with a hemostat, or a sharp explorer is used to remove it with a counter clockwise motion.^{14,15} If the abutment screw fracture occurs within the body of the implant, retrieving the screw fragment will be more challenging. A modified spoon excavator can be used to engage



Fig. 4 – Placement of Gingival Former



Fig. 5 – Open tray impression



Fig. 6 – Fabrication of new prostheses

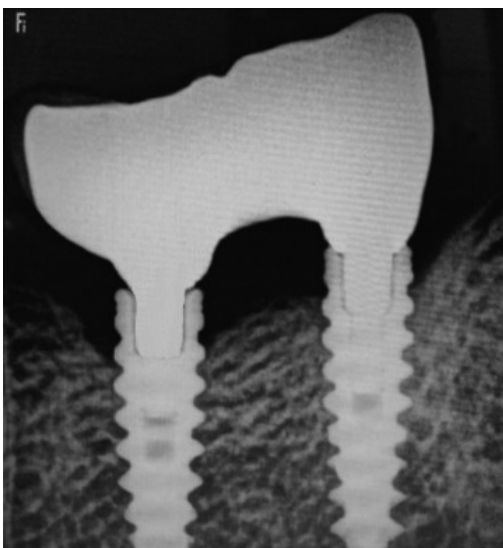


Fig. 7 – RVG showing accurate fit of abutment screw and fixture

the fractured screw after making a groove on it. The working end of the spoon excavator is cut perpendicularly to engage the groove on the fractured fragment.

Conclusion

Although clinicians can use various techniques to remove fractured abutment screws, every effort should be made to eliminate the cause of screw fracture. Conservative techniques are to be advocated initially before considering the use of commercial retrieval kits. Retrieval of the broken screw fragment should be done judiciously to prevent any internal damage to the implant structure. More clinical research should

be conducted to determine the effectiveness of various techniques in the retrieval of fractured abutment screws.

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