

Retrieval Technique for Fractured Implant Abutment Screw: A Case Report

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Abstract

Fractured Abutment screw is one of the complications of Implant-supported prosthesis. Removal of this screw becomes utmost important task in the clinical situation. There are many techniques mentioned in the literature such as implant repair kits, ultrasonic scaler tips to deal with this clinical situation. This case report presents a method to remove such fractured component which is cost effective, easy, and does not require elaborate equipment.

Keywords: Abutment Screw; Fracture; Dental Implant; Retrieve

Introduction

Implants have emerged as a promising treatment option for the rehabilitation of edentulous spaces. A thorough diagnosis and treatment planning is very important for each case. The key biological parameter for implant success is osseointegration. However apart from biological factors, implant failure may also be attributed to mechanical factors such as those related to implant components.

In implant prosthodontics, abutment screws and prosthetic retaining screws have the maximum potential for fracture. This can be due to biomechanical overload caused by bruxism, unfavourable superstructure and malfunction [1-3]. Screw loosening and undetected micro movements of the abutment under functional loading may lead to the fracture of implant abutment or implant screw.

Implants with internal taper/cone-joint anti-rotational components enhance the strength of the system as compared to those with the butt joint and external hex connection of the abutment [4,5].

Fractured screws are a challenge to remove. If the fracture is above the head of the implant, hemostat may be used to grasp the screw. However the real challenge is to retrieve the broken screw component if it is below the collar height. Some kits (Nobel Biocare USA, Inc, Yorba Linda, Calif.; Implant Innovations, Inc, Palm Beach Gardens, Fla.; ITI Dental Implant System Institute Straumann Waldenburg, Switzerland) by different manufacturers are there to facilitate the removal of the screw. But the problem is, these systems may not be available at that time with the clinician. Also one

has to be careful regarding the amount of heat being generated while using these kits. Moreover, they are not very cost-effective also. The following case report presents a situation where such fractured implant overdenture abutment was retrieved using simple armamentarium.

Case Report

An edentulous patient reported to the Department of Prosthodontics, in this institution complaining of loose upper denture. On examination it was found that the patient was using the two implant supported overdenture and the abutment in the first quadrant (canine region) was fractured (Figure 1).



Figure 1: Implants placed in maxillary arch - 13 and 23 areas.

Apical part of the broken screw was retained in the implant. Both implants were radiographically examined and showed no sign of peri-implantitis and had osseointegrated properly. Two treatment options were considered: retrieval of the screw or replacing the implant. Patient was properly informed and with the consent of the patient retrieval of screw was planned.

Implant screw hole was flushed with air and dried to have a better view and accessibility (Figure 2). Round bur (SS White, New Jersey/ size 1/4) was placed in the high speed air rotor. The bur was placed on the top of the screw head in off centred position. After proper orientation, the handpiece was activated to create a small depression.



Figure 2: Abutment screw fracture in 13 implant head.

Then a tungsten carbide bur (SS White FG-271, New Jersey) was placed in the depression to create a notch. After successfully creating the notch in the screw head, a sharp probe was engaged in it. The probe was rotated in the counter-clockwise direction. The fractured screw head was retrieved successfully (Figure 3). A new ball abutment was placed in the implant at the torque of 35 Ncm using a torque wrench. The fit of the prosthesis and implant was carefully evaluated and patient was placed on maintenance recall schedule.



Figure 3: Retrieved screw of ball abutment.

Discussion

The presented clinical situation illustrates one of the most common complication a dentist deals with an implant prosthesis. In a study conducted by Jung, et al. (2004), the incidence of screw fracture was found to be 3.9%. Screw fracture and screw loosening are closely linked. Screw loosening has been suggested as the first stage of screw fracture [6]. Thus, fracture of screw can be ascribed to screw loosening occurring due to non-axial movements during functional loading of the prosthesis. Abutment screw produces a clamping effect called the preload because of torquing which in turn holds the abutment to the implant. In external hex design, this clamping effect is integral in implant abutment joint [7]. In internal hex designs, protection against the bending force is inadequate because of absence of form and friction. Prevention of screw fracture is best treatment. Fractures of screw can be prevented by:

1. Avoiding occlusion overload.
2. Having adequate number of implants to bear the stress.
3. Avoid excessive angulation of implants.
4. Applying recommended screw tightening torque.
5. Replacing loosened screws instead of re tightening them.
6. Periodic maintenance and scheduling immediate dental visit if patient detects loosening of the prosthesis [8].

Various treatment modalities available to retrieve broken screw includes

1. Carbide bur in rotary handpiece
2. Use of ultrasonic tips
3. Use of Laser (Er:YAG)
4. Commercially available Retrieval systems

Decision to use of any of these methods is based on clinicians prerogative, the location of screw component, mobility of the component The technique described involves inexpensive instruments which are commonly found in a dental clinic. The force required to retrieve the broken screw from the implant is minimal provided threads of the implant have not been damaged. Creating a depression on the screw head acts as a guide for ditching and reduces the risk of damage to internal structure of the implant. However, a good amount of dexterity is required to prevent any damage to the internal structure of the implant.

Conclusion

Fracture of implant components is a very bitter clinical situation which may occur during rehabilitation phase. Careful treatment planning, correct occlusal scheme, recommended torque and proper patient instructions will definitely minimizes post-operative complications. Various treatment modalities are available to deal with such situations. One has to bear in mind that no method is universal to all situations. The technique described here is very simple, requires no elaborate equipment and is very cost effective.

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