CASE REPORT

A NOBEL TECHNIQUE FOR RETRIEVAL OF DENTAL IMPLANT ADHERENT COVER SCREW

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ABSTRACT:
Implant dentistry has emerged as the standard of care in past few decades. It has been benefiting the patients with predictable outcomes. Although higher success rates have been reported in the implant dentistry, there are several complications that do occur. These complications may be surgical, mechanical, biological and esthetic/phonetic. An unfortunate but often unavoidable occurrence for those of us restoring dental implants is complication with cover screws. There are few literature on the removal techniques for the same. The purpose of this article is to describe a Nobel technique for the retrieval of adherent cover screw.

Key words: Adherent cover screw, cold welding, Thread distortion, retrieval technique.

INTRODUCTION
The increasing popularity of dental implants, also increased the probability of failures due to late fractures, that is, post successful osseointegration, is expected. The failure of dental implants is due not only to biological factors, such as unsuccessful osseointegration or the presence of periimplantitis, but they also result from technical complications that involve implant body/fixture fracture, abutment screw fracture, abutment fracture, fractured prosthesis, adherent cover or cold welded cover screw.[1]

An unfortunate but often unavoidable occurrence for those of us restoring dental implants is complication with cover screw. Cold welded cover screw is a rare mechanical complication. There are few literature on the etiology and retrieval technique for the same. This cold-welded cover screw can lead to serious problem and it has to be retrieved without damaging the internal threads of the implant to start with the prosthetic phase.[2,3]

In this case report we have elucidated an adhered cover screw in an implant.

CASE REPORT
A 45-year-old male patient reported to the Department of Prosthodontics with the complaint of missing teeth in upper and lower dental arch. On clinical examination Patient was completely edentulous and planned for full mouth implant supported restoration. It was decided to place six implant in upper arch and six in lower arch.

Surgical procedure was planned and implant was placed with 11,13,16,21,23,26 in maxillary arch and 33,34,36,43,44,46 in mandibular arch. After 6 months of osseointegration period, second stage surgery was performed and healing abutment was screwed in relation to all the implant except 46.

Problem was encountered in unscrewing the cover screw of implant in relation to 46 with a hex driver and the driver started to slip in the hex slot of the cover screw. Manual ratchet was also tried by applying reverse torque of greater than 35 N, however this doesn’t help in loosing of screw. The slot which engages the hex driver had worn out because of repeated trail of hex driver. And this made difficult to precisely fit the driver in cover screw slot. The probable reason for cover screw adhesion is either mismatching of threads of cover screw and internal hex of implant body, cold welding of cover screw and implant, distortion of threads or can be formation of bone around the edges of cover screw and implant junction. To rule out the bone formation around the edge of a screw was verified by intra-oral peri-apical radiograph and later on clinically Correlated. This revealed no bone formation around the junction of cover screw and implant. (Fig: 1) It was challenging to unscrew the cover screw without damaging the internal hex of implant. Decision was made to make extension of plus shaped on the cover screw to engage the same shaped screw driver. Before making a slot the G-cuff was placed over the implant site to prevent the adjacent soft tissue from any iatrogenic damage. (Fig: 2) The Plus shaped slot was made by grooving the cover screw with carbide straight fissure bur with high speed hand piece. Obtained a small screwdriver kit from hardware store(JACKLY JK-6036C). These are readily available and
are easy to use. (Fig: 3) Used an appropriate size “mini” screwdriver to remove the screw. This screwdriver precisely engaged the cover screw. (Fig 4) The cover screw was retrieved easily using the cross shaped screwdriver. (Fig: 5) The internal threads of implant were untouched and well preserved. The fit of abutment was verified clinically and radiographically. After irrigation with betadine the healing abutment was placed. (Fig: 6)

**Figure 1:** Radiograph showing no bone formation around the junction of cover screw and fixture

**Figure 2:** The G-cuff was placed over the implant site to prevent the adjacent soft tissue.

**Figure 3:** Screw Driver set (JACKLY JK-6036C)

**Figure 4:** Selected Screwdriver precisely engaged the cover screw.

**Figure 5:** Showing Retrieved Cover screw.

**Figure 6:** Cover screw replaced by healing Cap.

**DISCUSSION**

Various situations encountered where cover screw retrieval is difficult are: Manufacturing error, bone covering the edge of the cover screw, and wearing off the hex driver. In the previously reported cases, when cold welded cover screws were inspected, dried blood was always present over the threads of cover screw. Thus, the primary reason
for the cold welding is the blood and bone debris in and around the implant. [3]

This clinical situation presents one of the rare mechanical complication during second stage surgery. The reason for adhered cover screw may be mismatching of the threads of cover screw and internal hex of implant body. Other reasons can be manufacturing defect of screw, over torqued cover screw, and the cold welding because of the dried blood between the threads of cover screw and internal hex of implant.

Several techniques of retrieval for adherent cover screw have been tried by clinicians, such as reverse torqueing, ultrasonic tip to vibrate the screw during the retrieval process, application of crushed ice over cover screw to shrink screw threads, drilling into the screw access until the body of screw get disengaged, with high speed hand piece and carbide tapered bur but this can lead damage to internal hex of the Implant, and customizing the hex driver. [4-6] In this described clinical situation the cover screw could not be retrieved by reverse torqueing, ultrasonic vibrations. So, a plus shape notch was prepared over the screw head for the precise interlocking of manual screw driver tool from tool set and cover screw was unscrewed.

It is not only necessary to salvage the cover screw but at that the same time one should know the reason for adherent cover screw and how to prevent this adhesion. [2,7,8]

Precautions to be taken:
1. In olden days petroleum jelly was applied over contacting surfaces.
2. Thorough irrigation is recommended to avoid blood contamination/wedging of blood debris between the contacting surfaces.
3. Small amount of antibiotic ointment may be applied on the screw threads.
4. Straumann recommended application of chlorhexidine gel inside the implant.

The present technique is cost effective, simple and applicable to all implant systems and can be effectively used in clinical situations where cover screw adhere to implant due to any of the above described reasons.

**References**


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