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Removal of a fractured abutment screw within the implant body: A case report



KEYWORDS

Fractured abutment screw;
Screw retrieval instruments;
Counter-torque device

In addition to the osseointegration failure involving a breakdown of the established osseointegration by peri-implantitis, the most common implant failures are mechanical complications such as crown fracture, framework fracture, screw loosening, screw fracture, and fixture fracture due to improper occlusal force.^{1,2} Removing a fractured abutment screw within the implant body is time-consuming and challenging due to poor visibility of the fractured screw fragment embedded in the implant. Various implant manufacturers have designed screw retrieval instruments to remove fractured screw fragments.³ A relatively non-invasive technique to remove the fractured screw fragments shall be prioritized for preserving the integrity of the implant without interfering with the implant's osseointegration. This case report demonstrated the removal of a fractured abutment screw within the implant body by a counter-torque screw-retrieval device and then replacing it with a new abutment screw for prosthesis fabrication later.

This 52-year-old male patient consulted the dentist who performed the dental implant for him with the chief complaint of the detached crown of the right maxillary second molar from the dental implant (Fig. 1A). This prosthesis had been used for about seven years. He still wanted to repair the failed prosthesis from the original dentist. Intraoral and radiographic examinations revealed a root-form cylindrical implant (Ankylos®, Dentsply Sirona Inc, Charlotte, NC, USA) replacing the right maxillary second molar (Fig. 1B). This dental implant had a fractured

abutment screw within the implant body (Fig. 1C). The implant was osseointegrated and showed no sign of peri-implantitis. Therefore, we considered an optimal treatment option to retrieve the fractured screw fragment and replace it with a new abutment screw to fabricate a new prosthesis on the original implant. After discussing with the patient and obtaining informed consent, a repair procedure was scheduled. At the following first appointment, the dentist used a straight fissure bur to create a groove of a sufficient depth on the fractured screw surface carefully and then used a counter-torque screw-retrieval device to remove the taper fractured screw fragment out from the implant by a counterclockwise screwing action (Fig. 1D and E). Subsequently, a healing abutment was screwed into the original implant to let the tissue heal (Fig. 1F). At the second appointment, a new abutment screw was inserted into the original implant for an impression to fabricate a new prosthesis (Fig. 1G). At the third appointment, a zero-degree cusped crown was fabricated and cemented to the abutment of the original implant (Fig. 1H). Finally, the patient had the new functioning prosthesis connected to the original implant.

Although the abutment screw fracture is uncommon (0.5%–8%), the hard difficulty in removing the fractured screw fragments makes its management challenging.⁴ Removal difficulty is inevitable if the fractured abutment screw is in tight engagement with the implant threads. The retained fractured screw fragment is usually firmly embedded in the implant. Various methods of removing

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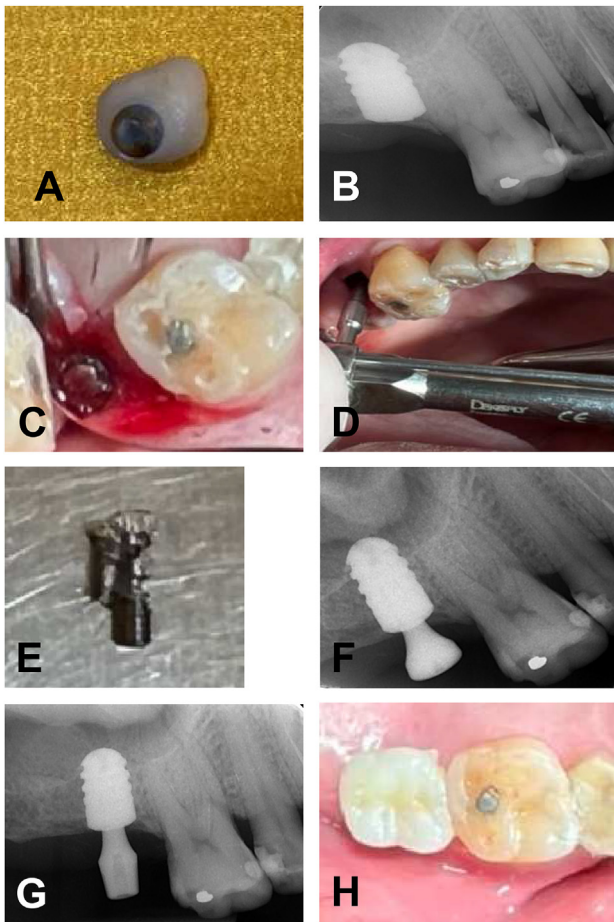


Figure 1 Clinical and radiographic photographs of our case. (A) The detached crown of the right maxillary second molar from the dental implant. (B) Radiographic photograph revealing a root-form cylindrical implant replacing the right maxillary second molar. (C) Clinical photograph showing a dental implant with a fractured abutment screw within the implant body. (D and E) The dentist used a straight fissure bur to carefully create a groove of sufficient depth on the fractured screw surface and then used a counter-torque screw-retrieval device to remove the taper fractured screw fragment from the implant with a counterclockwise screwing action. (F) Subsequently, a healing abutment was screwed into the original implant to let the tissue heal. (G) Radiographic photograph exhibiting a new abutment screw in the original implant for an impression to fabricate a new prosthesis. (H) Clinical photograph showing a zero-degree cusped crown cemented to the abutment of the original implant.

fractured screw fragments from implants have been reported.^{3–5} When a fractured screw fragment cannot be removed or a problematic removal damages the implant's internal threads, many dentists choose to remove and replace the implant or leave it unattached to the superstructure.⁴ For patients, however, once an abutment screw breaks, a cost-effective and less time-consuming method is

to retrieve the fractured screw fragment and maintain the integrity of the internal threads of the implant, and then directly connect a new abutment screw to the original implant.⁵ In Taiwan, dental clinics are numerous, and clinic dentists generally can provide dental implant services. Any dentist is at risk of screw fractures in implants that he or she performed before. Therefore, in addition to dental implant technology and service marketing, the general dentists in the community shall also be familiar with the procedure to handle failed implants to provide proper treatment for their patients with the failed implants by themselves.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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