Case Report

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Retrieval of Fractured Abutment Screw and Rehabilitation of Posterior Single Implant Crown with New Prosthesis Using Stock Abutment for Impression: A Case Report

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ABSTRACT

Background: Abutment screw fracture is one of the most common prosthetic complications in dental implant procedures. As the availability of components, its cost, the involved time has direct effect on decision making for the patient for salvage of dental implant. This case report describes such case of retrieval of fractured abutment screw fragment and successful management using the clinical abutment to serve as open tray impression analogue saving cost without compromise the accuracy.

Keywords: Prosthetic abutment, dental implant, screw fracture, implant impression, implant complications, open tray impression.

INTRODUCTION

Implant-retained prostheses are the best treatment option for restoring missing teeth for patients with partial and complete edentulism. Reported long-term survival rates are 95% or greater over 5 to 10 years.[1,2] Abutment screw fracture is one of the common prosthodontic complications in dental implant therapy. Gradual internal deformation of implant, over-tightening of the abutment, not applying sufficient torque, casting defects in castable abutment design are few common reasons of abutment screw loosening and fracture.[3] Hex designs with a butt joint connection show more fracture compared to conical connection.[4,7] This screw loosening is first to sign leading to screw fracture if neglected leads to prosthetic failure and may compromise the life of functional dental implant if not treated in time.[5,6] Fractured abutment and prosthetic screws are a challenging and time-consuming complication in implant dentistry.[8] The patient often ignores the follow-up appointments for a periodic checkup and visit the dental office after the incidence of fracture. The challenge of treatment increase with many times grown-up surrounding soft tissue, debris collection in screw hole leading to making it difficult to impossible the retrieval of screw fragment and use the implant for restoration. Fractured abutment screw retrieval from the dental implant is dependent on the level of screw fracture, accessibility to clinical area available armamentarium to the clinician and the use of magnification for retrieval attempt.

CASE REPORT

A 46-year-old woman in good general health reported for a dislodged healing abutment with respect to an implant placed in the left mandibular first molar after approximately four years of implant restoration (lifecare implant devices, internal hex 10 mm length 5mm width) On detailed history recording patient revealed that before two months she felt the looseness of the crown but not bothered to visit the dentist as it has no pain and she was comfortable to chew. Suddenly after two months, she felt an increase in mobility of crown, and it came out while chewing soft food. Patient

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carefully carried the prosthesis and enquired about refitting the same.

Fig 1: First clinical view.

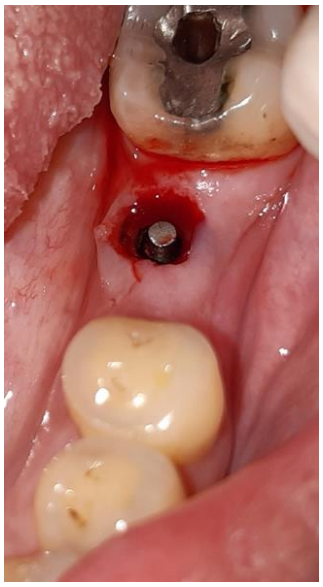

Fig 2: View of the screw.

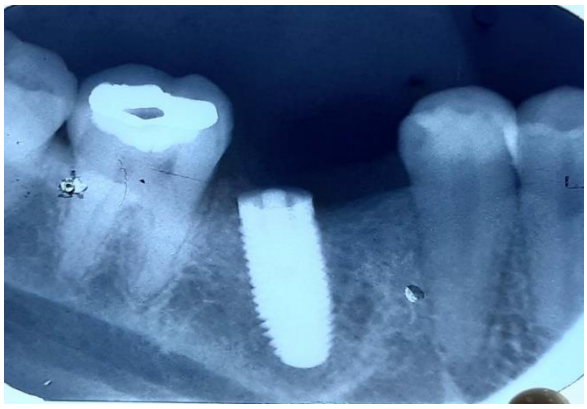

Fig 3: IOPA before retrieval of screw.

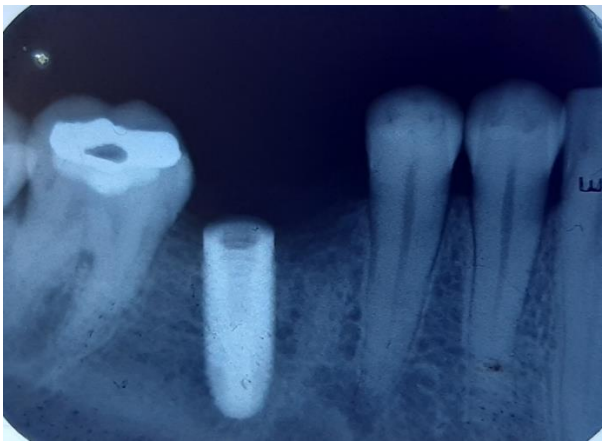

Fig 4: IOPA after retrieval of screw.

Fig 5: Fractured prosthesis with retrieved screw.

Fig 6: Stock abutment above occlusal level.

Fig 7: Open tray impression with abutment.

Fig 8: Laboratory analogue in situ with a prosthetic abutment.

Fig 9: Abutment for occlusal adjustment.

Fig 10: Prosthesis in situ.

Fig 11: Picture Side view of prosthesis.

Examination of prosthesis revealed that it was a cement-retained crown on stock straight abutment with hexagonal connection design. (Fig 1) Intraoral examination revealed soft tissue overgrowth covering the implant access hole partially. This made it unable to check the orientation of prosthesis in the mouth in the same appointment to check the hexagonal connection fit of the existing prosthesis. (Fig 5) close examination of fractured screw revealed the level of fracture was at neck of the screw. The prosthesis design was eccentric with mesial cantilever indication of compromised implant position mesiodistally. The pre retrieval radiograph verified the findings. The IOPA revealed marginal crestal bone loss with distally inclined implant body with a fractured screw at the level of crestal border of the implant. (Fig 3)

The existing clinical situation, possible consequences and outcomes are discussed with the patient in detail. With financial and time constraints patient decided for screw removal attempt and use of the same dental implant for prosthesis if possible.

To get the access and visibility of clinical sight, the grown-up tissue was cut using a surgical blade no—15 c under local anaesthesia. Bleeding was controlled with surgical gauze pack. The fractured screw head is easily seen (Fig 2). Attempts were made to remove the screw with the help of a tweezer. As the screw is well torqued, it showed no movement. Few threads of the screw are seen. Use of ultrasonic scaler tip (EMS scaler) in anticlockwise direction with light brush stroke helped to loosen the screw. The loosened screw was carefully picked up with surgical tweezers. Here direction is important as clockwise direction will further tighten the screw. Retrieved screw fragment is thoroughly inspected for signs of thread damage(Fig 5). After screw removal, the inside channel of implant body was flushed with normal saline followed by betadine. After the betadine channel was again thoroughly flushed with normal saline. Then the channel was packed with Teflon tape. Again, a radiograph is recorded for verification of complete retrieval of screw parts. (Fig 4) and margins of peri-implant tissue were trimmed little with round surgical bur with micromotor under copious irrigation of saline. This step was carried out to accommodate flare of the stock gingival former design. After stopping of bleeding gingival former was placed. To check the intactness of thread pattern and shaping of peri implant soft tissue collar healing, gingival former of 3mm height showed satisfactory fitting of the threads and peri implant collar support.

After five days of patient-reported for the second clinical visit, the patient decided to go for a similar prosthesis as an old one with stock abutment and cemented crown. The decision was made to make new prosthesis as attempts failed to separate the abutment from the cemented prosthesis. The stock abutment was checked for intraoral fit. It was satisfactory. The height of stock abutment was 5mm above the occlusal level of the mandibular plane. (Fig 6) To cut down cost and record and transfer the true implant orientation, it was decided to use the same abutment for impression-transfer and final abutment. Perforated stock steel tray was modified with an opening cut in the lower molar region. The fit of abutment was to be verified with radiograph for passive and complete engagement of implant margins as only clinical tightness may give the false fitting impression in supracrestal soft tissue engagement of overgrown alveolar bone. The open-access channel of the prosthetic abutment was blocked with the Teflon tape. Impressions were made with addition silicone one stage impression. Care is taken to keep access hole of abutment open during making an impression and used it as open tray impression analogue. (Fig 7) After retrieval of impression, the laboratory analogue was fixed to impression with hex driver. As laboratory analogue is directly attached to the final prosthetic abutment, errors in transfer from impression are minimised. (Fig 8)

The impression is poured with a gingival mask around abutment analogue connection. With the use of the maxillary model, appropriate height of stock abutment is adjusted, saving sufficient antirational features with adequate height. It was decided with discussion with the patient to make prosthesis cementable with open access for future easy retrieval of a cementable crown. And any future incidence of screw fracture, the same prosthesis may be used if only prosthetic abutment screw is to be replaced, saving the cost of new abutment and prosthetic fabrication for the patient, assuming the retrieval of screw without damage to implant internal surface. Patient accepted the compromise in aesthetics of crown. As in future the chances are high of this incidence as implant position is distal, and new crown will be mesial cantilever.

The abutment height was adjusted in lab maintaining sufficient antirational and retentive features for the crown. Minor corrections are done intraorally with functional and non-functional movements avoiding direct occlusal contact on the abutment. A metal-ceramic crown was fabricated. Occlusal adjustments are made. Glaze firing has done prior cementation of this window crown with abutment. Cementation is done extra orally with glass ionomer cement. (Fig 9,10)

Prosthesis again verified for occlusal contacts. Minor corrections are polished with the intraoral ceramic polishing kit. The prosthesis is torqued as per manufacturers instruction. The access opening is filled with Teflon tape and occlusal sealing done

with glass ionomer cement. Consequent follow up of 24 hrs, 7 days and six months are recorded.

The patient has been instructed to report for periodic annual checkup. On emergency for any minor variation or movement felt with the crown.

DISCUSSION

Abutment screw fracture is one of the most common prosthetic complications in implant dentistry. Retrieval of the broken screw part from implant decides the future treatment depending upon the intact implant body. Cost constraints, compromised implant positions, availability of required implant components if the implant system is different from doctors' regular use makes an additional expenditure for the patient. At such case, innovative problem-solving approach without compromising accuracy and outcome is a challenge for clinicians. In this case, with the use of stock abutment as open impression analogue and open access cementable prosthesis concept is experimented with promising clinical outcome.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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