TPM Vol. 32, No. S5, 2025
ISSN: 1972-6325
https://www.tpmap.org/

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# A NOVEL CLINICAL TECHNIQUE FOR FRACTURED ABUTMENT SCREW RETRIEVAL - A CASE REPORT:

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**ABSTRACT**:

**Background:** Abutment screw fracture is a clinically challenging situation for a Prosthodontist. Fracture of the screw tests the skill and ingenuity of the doctor. While there are many techniques and retrieval kits available, different clinical situations will demand modifications in the approach to retrieval of the fractured abutment screw.

**Case report:** 81 years old male patient reported to the department of Prosthodontics and crown & bridge in our institute with the fractured abutment screws in the lower right and left mandibular posterior region. The prosthesis was fabricated 12 years back in a private clinic. Clinical and radiographic examination revealed abutment screw fractures in three locations i.e, at screw thread level in relation to 35 and 46, at abutment screw shank level in relation to 37 region,which resulted in screw loosening of prosthesis. various methods for retrieval of fractured screw as mentioned in the literature were considered. In this case 2 different techniques were used for retrieval depending upon the site of abutment screw fracture.

**Conclusion:** Different clinical situations require different techniques and modifications of those techniques due to complex nature, site and cause of abutment screw fracture.

KEYWORDS:
- Retrieval Techniques
- Fractured Abutment Screw
- Dental implant complication
- Implant screw fracture
- Abutment screw head stripping
- ASF-III

## INTRODUCTION:

Dental implant therapy is becoming ubiquitous, making it possible to reliably and successfully restore both fully and partially edentulous arches. This has played a role in the development of "Prosthesis-driven" implant dentistry. Even though dental implant procedures have a high success rate of 97% to 99%, it's important to recognize that mechanical and biological complications can still occur. Biomechanical problems could include soft tissue inflammation, peri-implantitis, and osseointegration loss. Mechanical complications include abutment screw failure, porcelain fractures, and loss of retention. The implant-abutment design is one of the main factors associated with abutment screw fractures. In dental implant procedures, handling a fractured abutment screw presents a significant challenge to the prosthodontist.

Case report:

An 81 years old male patient reported to the department of prosthodontics and crown & bridge in our institute with the fractured abutment screws in the right and left mandibular posterior regions. The patient had implant supported fixed partial denture in mandibular arch. The prosthesis was done 12 years back at a private clinic. Clinical and radiographic examination revealed abutment screw fractures in three locations i.e, at screw thread

level in relation to 35 and 46(Figure 1: Pre operative radiograph with fractured abutment screw), at abutment screw shank level in relation to 37 region which resulted in screw loosening of prosthesis. Various methods for retrieval of fractured screw as mentioned in the literature were considered. In this present case, 2 different techniques were used for retrieval depending upon the site of abutment screw fracture. Before starting the procedure, the patient's general health condition was assessed. IANB was given in relation to lower left posterior region and flap elevated.

Technique 1: Novel and Innovative technique using Intra Oral Mixing Tips for ASF-II
As mentioned in the literature by Sane, et al[1] it was decided to use Intra Oral plastic mixing Tips supplied with light body elastomers for ASF-II type fracture since it was fracture at the screw shank level (Fig :2 Chowdhary R, Sonnahalli NK, Gala JN. Implant abutment screw fracture and techniques of retrieval: a literature review based on a novel abutment screw fracture classification. J Osseointegr 2023;15(1): 32-39[2]).
Later it was decided to modify the intra oral mixing tips for easy retrieval by heating the edge of the tip to engage the fractured screw head (Figure 3: Heating of intra oral tip).
The heated intra oral tip edge was placed carefully into the implant platform to engage the fractured screw in 37 region.(Figure 4: Intra oral tip placed in the implant platform)
Initially the intra oral tip edges got blunted due to saliva and blood contamination in the site (Figure 5: Blunted intra oral tips).
After negotiating 2 or 3 times, the fractured screw site was engaged by the intraoral tip. (Figure 6A: Retrieved screw with intra oral tip).
When the intraoral tip engaged the screw correctly it was left for 10 seconds, held in place to harden, was rotated in anticlockwise manner and then screw was retrieved (Figure 6B: Retrieved screw with intra oral tip ).

Technique -II
For ASF-III type of fracture the Gooty et al.., (2014 )[3]suggested a retrieval technique using high speed handpiece with a #329 tungsten carbide bur. A slot of 0.5 to 1 mm hole on the top of the fractured screw head was created (Figure 7: Slot Preparation) and then ultrasonic scaler tip was placed in the hole to loosen it. Vibration of the ultrasonic tip in the presence of the slot, the abutment screw was loosened. When it reached the implant platform level, it was removed with artery forceps (Figure 8: Retrieved fractured abutment screw).
After retrieval of all the screws, post op OPG (Figure 9) was taken to confirm complete retrieval of the fractured screw.

## DISCUSSION:

For retrieving fractured prosthetic screws, various authors have suggested mechanisms. However, the goal should be to do so without causing harm to the implant platform. When the abutment screw fractures at the screw head level, retrieving the broken screw is simpler. But it is more difficult to retrieve a fractured screw if it is at the level of the screw thread.
Comparing techniques of Gooty et al. (2014)[3] and Sane et al. (2023)[1] to other techniques mentioned in the literature, they are more economical and conservative. If the earlier techniques were unsuccessful in recovering the fractured abutment screws, any one of the retrieval kits that are available commercially, may be used[4].
Converting the healing abutment to a prosthetic abutment is a novel approach to managing irretrievably fractured abutment screws especially when the fracture occurs at the deeper level. Nevertheless, this approach will not have good prognosis and hence it cannot be universally followed.
If all attempts to retrieve the fractured abutment screws are unsuccessful, the threads can be removed and utilized as post space for a custom-made post and core restoration[5].
The method followed in the present case was chosen, since fracture occurred at the shank level which comes under ASF-II type according to classification of abutment screw fracture based on the location of fracture.

## CONCLUSION:

In clinical implant practice, modification of established retrieval techniques for effective removal of fractured abutment screws will be necessary as suggested in the present case.

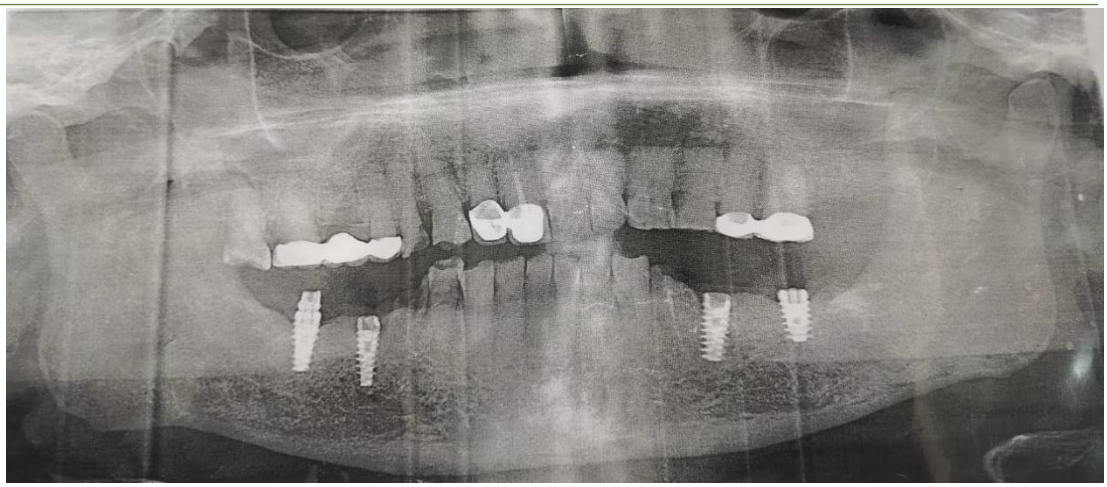

Figure 1: Preoperative Radiograph with fractured abutment screw

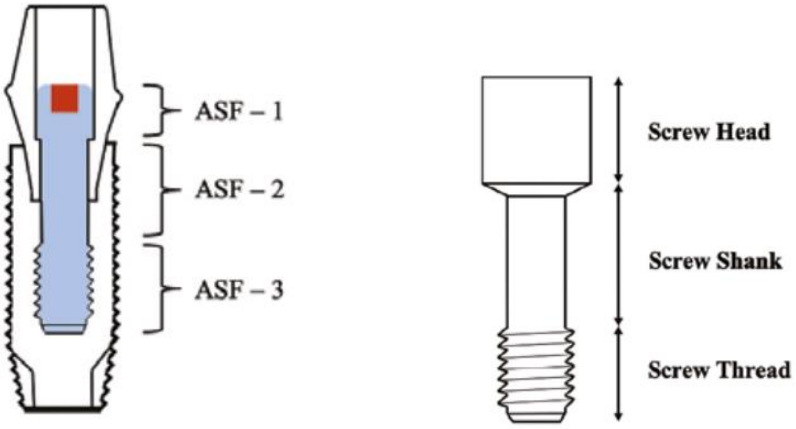


**Fig :2** Chowdhary R, Sonnahalli NK, Gala JN. Implant abutment screw fracture and techniques of retrieval: a literature review based on a novel abutment screw fracture classification. J Osteointegration 2023;15(1): 32-39[2]


Figure 3: Heating of intraoral tip

Figure 4: Intra oral tip placed in the implant platform

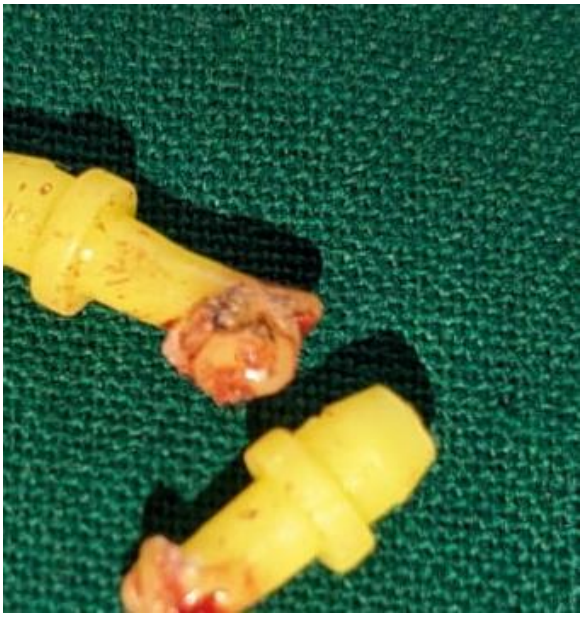

Figure 5: Blunted intra oral tips

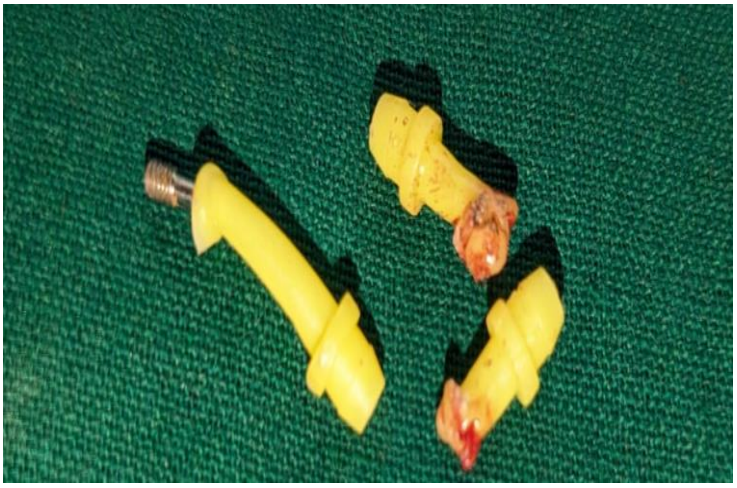

Figure 6: Retrieved screw with intra oral tip

(Figure 6B: Retrieved screw with intra oral tip ).

(Figure 7: Slot Preparation )

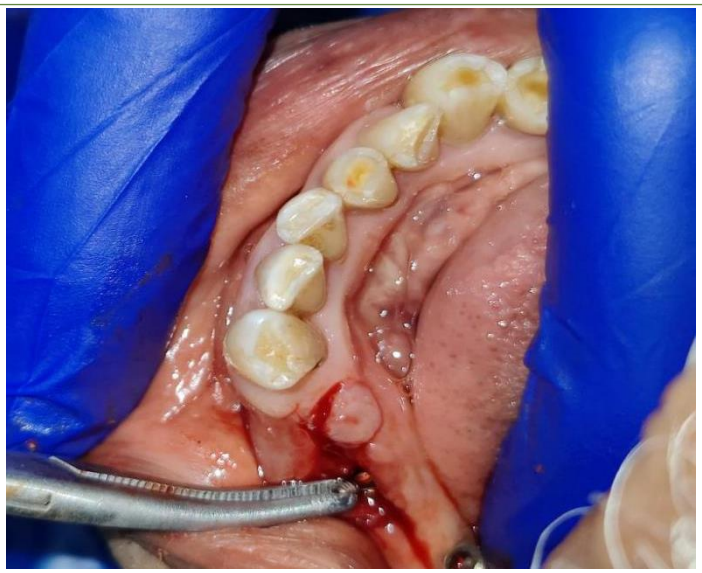

Figure 8: Retrieved fractured abutment screw

Figure 9: POST-OP OPG

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