

# MANAGEMENT OF IMPLANT SCREW LOOSENING -A CASE REPORT

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## Abstract

*Dental implants have been a broadly recognised treatment modality to replace missing teeth and in order to restore the oral functions. The utilisation of root form endosseous implants have increased considerably and this option has become much more sophisticated with the introduction of latest designs and concepts. Long term post placement studies have revealed that prosthetic complications, including screw loosening, screw fracture, framework and implant fracture. Abutment screw loosening is the second most cause of failure of implant supported crowns, after loss of osseointegration. This condition is mostly witnessed in single implant supported restoration. Management of screw loosening is a challenging procedure and this clinical report describes the management of an implant abutment screw loosening of lower back teeth region with minimal damage to the existing restoration making it possible to be reused.*

**Keywords:** Dental Implant, Implant Abutment Screw loosening, pre load, splinted cement retained implant prosthesis

## Introduction:

The replacement of missing teeth by implant supported prosthesis has become a popular option after the introduction of the concept of

osseointegration with titanium fixtures<sup>1,2</sup>. The use of root form endosseous implant has increased considerably and this restorative option has become more refined with the introduction of newer designs and concepts. Screw loosening, screw fracture, prosthetic component and implant fractures are the different prosthetic complications seen after loading the implant<sup>3-5</sup>. Among these, screw loosening is the most common complication. This is seen more in single implant supported prosthesis with external connection and molars<sup>6-9</sup>. Reasons for screw loosening include inadequate preload, inappropriate implant position and occlusal scheme, variations in hex dimension and abutment counterparts, differences in fit and accuracy, tension on abutment, improper screw design and excessive occlusal forces<sup>10-12</sup>.

## Case Report

A 45 year old female patient reported to The MAHE Dental College, Department of Prosthodontics with a chief complaint of dislodged implant crown and misfit implant crown in the right lower back tooth region. (Fig. 1)

On examination, implant crown in 47 was dislodged and the implant crown in 46 was rotated. RVG was made and the radiographical assessment



Fig. 1 – Pre-Operative photograph

revealed discrepancy between the transmucosal abutments and the fixture head which indicated implant abutment screw loosening in 46 and dislodged crown in 47 (Fig. 2a,2b,2c). Both the implant prosthesis were screw retained. (Fig. 3)

As the loose crown was causing discomfort to the patient, it was sectioned and the screw and abutment were retrieved. 46 and 47 were done under paltop implant system.

Suitable straight abutment were screwed and adequate preparation was done. After acquiring adequate clearance, the access holes were packed with putty impression material and an abutment level impression were made using addition silicone and light body for fabricating a splinted cement



Figure 2 a,2b,2c – Pre-Operative Intraoral Photographs



Fig. 3 – Pre-Operative Intraoral

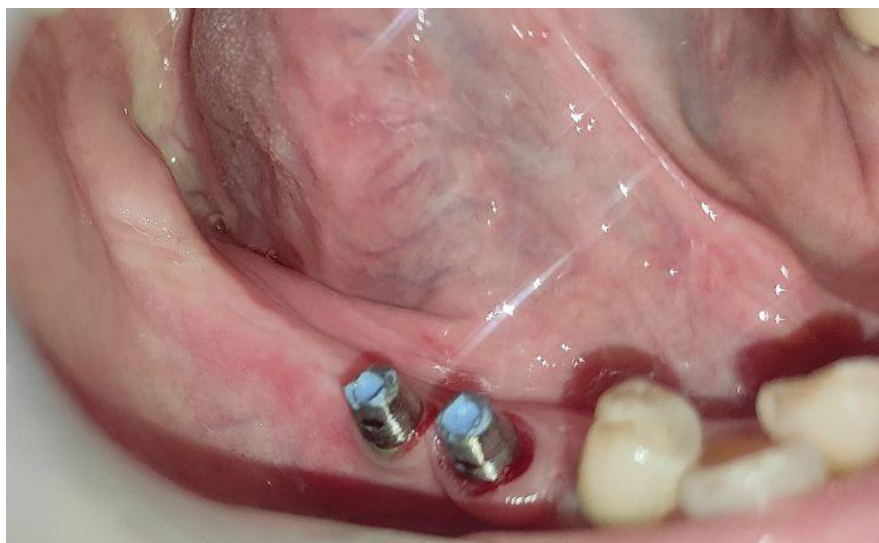


Fig.4 – Straight abutment placed in 46 And 47 region and access holes packed with putty impression material

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retained implant prosthesis in 46 and 47 (Fig.4, Fig.5).

Prior to cementation, the access holes were packed with putty impression material and GIC. The splinted PFM implant prosthesis was luted with GIC (Fig.6, Fig.7). Excess cement in the proximal aspects were flossed.

## Discussion

This case report illustrates one of the mechanical complication which can occur during prosthetic stage of implant surgery. The radiovisiography revealed discrepancy between the transmucosal abutments and the fixture head which indicated implant abutment screw loosening in 46 and dislodged crown in 47. The reason for screw loosening was due to inadequate application of tightening torque to generate the necessary preload. The screw loosening of implant abutment can cause issue for both the dentist and patient .It is essential to sacrifice the overlying restoration to give access to the screw. Screws have been studied considerably in the engineering literature and dental implant screws have been improved as a result.

Proper design of the occlusion and sound osseointegration, a reliable connection between implant and abutment is important for the appropriate functioning and stability of implant restoration. Several clinical studies have reported incidences of abutment loosening in various types of abutment connections. The external hex

configurations is more prone to abutment screw loosening. Limited engagement of the external member and the presence of a short fulcrum point when tipping forces are acting, are the main reason for abutment screw loosening in external hex connections. In the external hex configuration, the axial preload of the abutment screw determines the stability of the connection. There is no lock form or positive locking by the external hex. The rotational position was determined by external hex but it does not absorb any lateral loading and the tensile force and so the stress is concentrated on the abutment screw. Different methods have been tried to reduce the screw loosening. The two important methods used to counteract screw loosening include the incorporation of an antirotational element and attaining optimum screw joint preload.

Several guidelines recommended for improving screw joint stability include centering the occlusal contact, flattening the cuspal inclination, proper tightening of the abutment screw, narrowing the buccolingual width of the restoration, and reducing cantilevers. Incorporation of these features into the restoration will help to decrease the incidence of abutment screw loosening. There are three methods for managing abutment screw loosening. The most conservative method is removal of the crown along with the abutment as described in the case report. The second method is to identify the access of the connecting screw head. The access may be labial, occlusal or lingual. This should be identified during the cementation of the prosthesis. The abutment connecting screw is then removed or re-tightened through the perforation

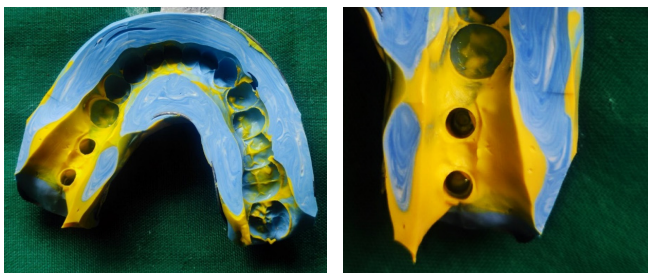


Fig.5- Putty Impression in relation to 46 and 47



Fig. 6 – Final      Fig. 7 – Post Operative Splinted Prosthesis Photographs

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made at the access in the crown. Depending on the location of the access the crown, it can be reused or discarded. The third method include vertical cuts made on the crown to separate the crown from the abutment.

## Conclusion

A conventional mode of managing abutment screw loosening without consecrating the crown on various reasons for abutment screw loosening has been described. Inadequate preload is the most accepted reason for abutment screw loosening in two piece endosseous root form implants. Employing suitable tightening torque with wrench having torque gauge will deliver the optimum preload and splinted crowns can be utilized for such clinical situations.

## References

1. Krishna R, Kejriwal R, Suma J. Retrieval of Cold Welded Dental Implant Cover Screw using a New Technique. *Int J Oral Implantol Clin Res* 2015;6(3):69-72 2.
2. Nergiz I, Schmager P, Shahin R. Removal of a fractured implant abutment screw: a clinical report. *J Prosthet Dent* 2004;91: 513-517. 5. 3.
3. Healing abutment Does Not Unscrew: safest way to remove it without damaging the Implant Threads? Available from: [www.osseonews.com](http://www.osseonews.com)
4. Removing a cover screw on nobelbiocare replace select implant any ideas. Available from: [www.osseonews.com](http://www.osseonews.com)
5. Haack JE, Sakaguchi RL, Sung T. Elongation and preload stress in dental abutment screws. *Int J Oral Maxillofac Implants* 1995;10(5):529-536
6. Vaidya S, Gupta S, Kapoor C. Coldwelded Healing Cap: A Unique Implant Complication and its Management. *Int J Clin Implant Dent* 2015;1(2):72-76.
7. Jorner L. Loads and designs for screw joints for single crowns supported by osseointegrated implants. *Int J Oral Maxillofac Implants* 1992;7(3):353-359.
8. Adell R, Eriksson B, Lekholm U, Branemark P I, Jemt T. Long-term follow-up study of osseointegrated implants in the treatment of totally edentulous jaws. *Int J Oral Maxillofac Implants* 1990; 5: 347-359.
9. Adell R, Lekholm U, Rockler B, Branemark P I. A 15-year study of osseointegrated implants in the treatment of the edentulous jaw. *Int J Oral Surg* 1981; 10 : 387-416.
10. Zarb G A, Schmitt A. The longitudinal clinical effectiveness of osseointegrated dental implants: the Toronto Study. Part II: the prosthetic results. *J Prosthet Dent* 1990; 64: 53-61.
11. Goodacre C J, Kan J Y, Rungcharassaeng K. Clinical complications of osseointegrated implants. *J Prosthet Dent* 1999; 81: 537-552.
12. Henry P J, Laney W R, Jemt T et al. Osseointegrated implants for single-tooth replacement: a prospective 5-year multicenter study. *Int J Oral Maxillofacial Implants* 1996; 11: 450-455.