


Current Evidence on Dental Implant Fracture

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Although a dental implant is a well-established treatment modality for the rehabilitation of edentulous arches; in the long-term, it is not free of complications. Early implant failure is mainly due to a lack of establishment of osseointegration. Late implant failure is due to loss of supporting tissue and mechanical problems because of biomechanical overload or implant fracture.¹

Implant fracture leads to the loss of both implant and the prosthesis, so it's a very disappointing situation for both patient and the clinician. The reported causes of implant fractures are due to improper fit of the prosthesis, defective implant design, long-term metal fatigue, occlusal overload due to parafunctional habits, implant location, length and diameter, and bone resorption. Bone resorption increases the crown-to-implant ratio and enhances biomechanical load.²

Pommer et al.² did a meta-analysis of oral implant fracture incidence and factors related to it. They reviewed 69 articles, which investigated 44,521 implants and reported 827 implant fractures. The overall incidence of implant fractures was 1.6%. The majority of fractures (85%) occurred in the premolar or molar regions and mostly (88%) in implant-supported fixed restorations. However, only 56% of the fractures were preceded by screw loosening. In a retrospective study, Yu and Kim³ evaluated the factors that affect implant fractures. They reported 13 implant fractures in 12 patients. The mean crown-to-implant ratio was 0.83:1. Various clinical findings such as screw loosening, marginal bone loss, periimplant diseases, and parafunctions were responsible for implant fractures. It is recommended that if these clinical symptoms are found, it is better to respond appropriately to avoid serious complications.

In a review, Tallarico et al.⁴ evaluated whether there were any possible factors influencing the fracture of dental implants. They studied eight articles, which included two systematic reviews and six retrospective studies. They found a mean incidence of implant fracture of 0.52% (ranging from 0.2 to 2.3%). The most common reason for implant fracture was poor implant planning with an improper selection of implant design and diameter and occlusal overloading. Hu and Qiu⁵ recently did a long-term retrospective study, with an average follow-up of 6.9 years, to analyze the incidence of implant body fracture and possible risk factors associated with it. They included 2,810 patients with 7,502 implants in the analysis. They found that the overall body fracture rate was 0.49% (37/7,502), among which 32.4% (12/37) were implants with a reduced diameter. They also found that most of the fractures occurred in the molar region (29/37) and in single implant-supported restorations (30/37). They concluded that an implant with a narrow diameter has a potential risk for implant body fracture in the posterior region. Unsplinted restorations are more associated with implant fractures than splinted ones.

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Balshi⁶ suggested three methods for the treatment of fractured dental implants. The first is to remove the fractured dental implant and place a new implant with a new prosthesis. Secondly, it is to maintain the osseointegrated fractured part of the dental implant and alter the prosthesis accordingly. Thirdly, the fractured part of the implant can be altered, and a new prosthesis can be given.

Studies suggest that there are multifactorial reasons for implant fracture. Proper treatment planning seems to be the key factor in reducing implant fractures. Timely follow-up is essential to reduce these complications. Screw loosening, periimplantitis, marginal bone loss, and occlusal overload, if any, should be observed and taken care of before implant fixture fracture.

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