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Management of a Failing Implant- a case report

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Abstract.*The use of dental implants has enabled the fabrication of highly functional and esthetic restorations and improved the predictability of treatment. However, at any point during rehabilitation and maintenance complications and failure can occur. The success rate in patients who are treated with dental implants, in general, is high for all implant systems. In prospective and retrospective studies, it varies from 84.9% to 100%.This article includes identifying the failing and ailing implants and timely intervention to avoid failure and successful restoration of function.*

Keywords*: Ailing, Failing, Failed implants, surviving implant, Bone loss, GBR, BWG*

I. Introduction

Dental implants have become an important therapeutic modality in the last decade .[1,2]This is attributed to the works developed by Brånemark (1985), [3] whodescribed the direct contact between the bone functional tissues and the biomaterial titanium which was termed osseointegration[4]Dental implants have shown high success rates (81 – 85% for the maxilla and 98 – 99% for the mandible)[5],but failure is unpredictable.. After the installation of endosseous implants, there are three possible responses that may occur in host tissues: 1.Acute or chronic inflammatory process, causing early implant failure 2. The formation of connective tissue surrounding implant, leading to osseointegration failure leading tofibrosseousintegeration 3.Living and functional bone tissue formation around the implants, resulting in Osseointegration[6,7]The success rate in patients who are treated with dental implants in general, is high for all implant systems [8, 9.] It varies from 84.9% to 100% in longitudinal studies of up to 24 years[10, 11, 12]. However, despite the high success rate, failures do occur most of the time unexpectedly [13-16]Beyond the implant loss, early marginal bone loss around endosseous implants is also considered a failure aspect. [17]Implant loss is divided into early failure, before the occurrence of the Osseo integration, and the late failure, after the implant receives occlusal load [18, 19, 20]. Success of osseointegration is defined as an association of functional and aesthetic results[, 21, 22] and depends on some factors, like implant biomaterial and superficial properties (topography and roughness surface), appropriate bone quantity and quality, non-occurrence of surgical complications, such as bone overheating and contamination, occlusal overload, and peri-implantitis. [23-31]Direct and indirect systemic factors that influence host response seem to be of great relevance in the identification of risk groups for implant loss.. According to Esposito et al, implant failure is related to immune inflammatory host response, an intense inflammatory process which compromises osseointegration leading to implant loss [32.].

II. Case Report

A female patient aged 23 years reported to Azeezia dental college with missing left and right lower molars(36,46) [fig1,] which was extracted due to gross carious destruction of the tooth structure.

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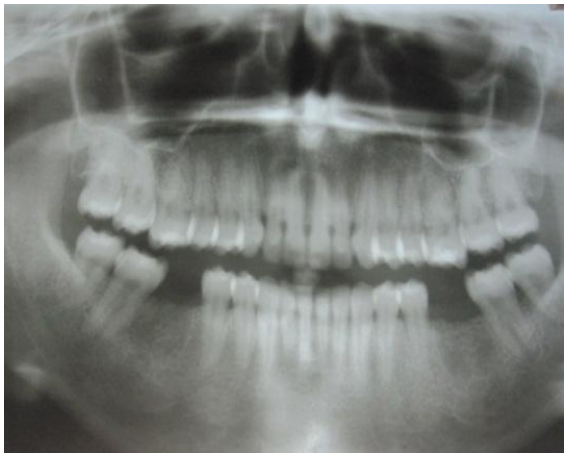


Figure 1

A detailed medical and dental history was recorded for any systemic disease and periodontal problem respectively. Radiographic examination [fig 1] was done to assess the bone quantity. Articulated Upper and lower diagnostic cast were used to study the occlusal pattern. A stent was made on the diagnostic cast Treatment was planned on 46 [lower right molar] with Nobel Biocare regular platform [4.3 x13mm] implant the surgical procedure was carried out following strict aseptic technique [fig 2].

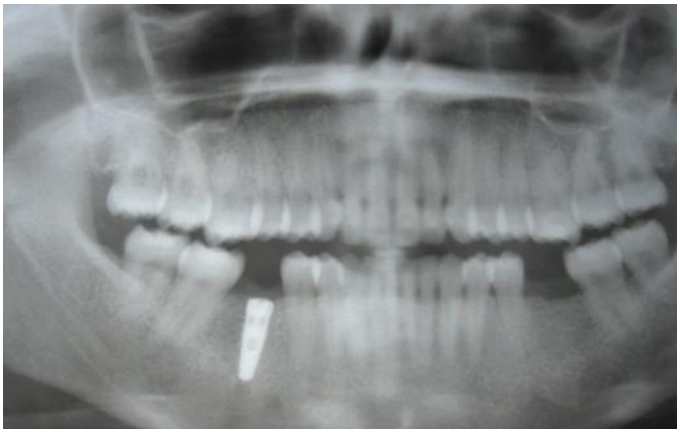


Figure 2

Resistance encountered during drilling confirmed that the bone quality was of Type D1.Patient was prescribed antibiotics, analgesics for 1 week and mouthwash regularly. Routine recall was carried out as normal, One month after the placement ofimplant, a sinus formation was noted on the crestal gingiva [Fig3] with a probing depth of more than 5mm extending to the implant. Periapical radiograph was taken[fig3] which revealed bone loss from the distal and mesial side.

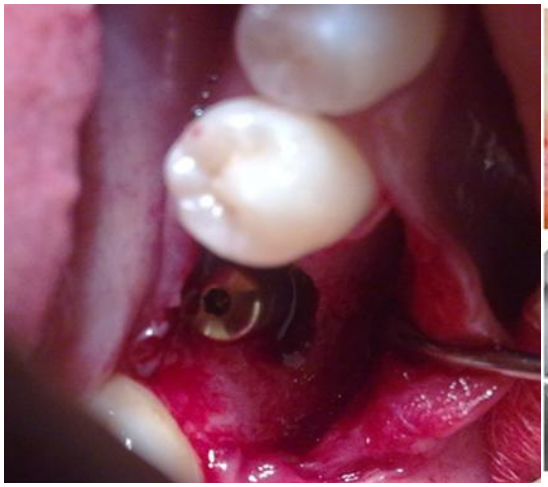


Figure 3

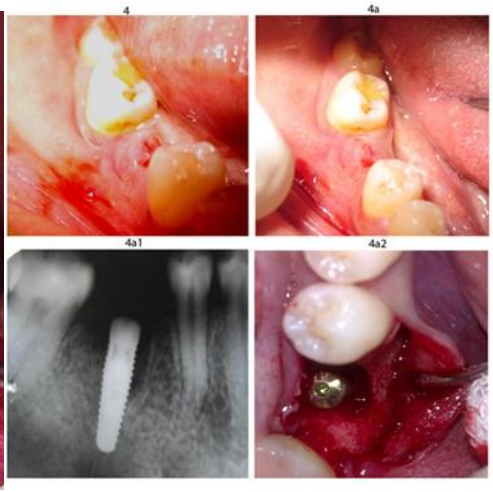


Figure 4

A flap was opened and a severe bone loss was noted on the mesial side involving half of the buccal cortical bone and extending to the distal side, but lingual cortical bone was intact and the implant was not mobile [fig 4]

This area was curetted thoroughly with special titanium coated instrument to avoid scratches on the implant , irrigated with saline betadine solution and finally burnished with tetracycline 50mg perml saline [fig 5].Area was grafted using Bovine graft [Osseograft from Advanced Biotech] which was mixed with patients own blood for better adaptation to the implant surface and covered with Resorbablecollagen membrane [Advanced biotech]Area was sutured and further protected with a non eugenol pack to prevent contamination and proper adaptation of graft and membrane. [Figure 5]

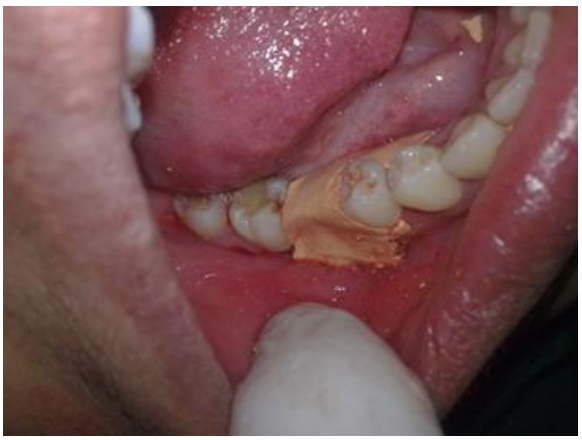


Figure 5

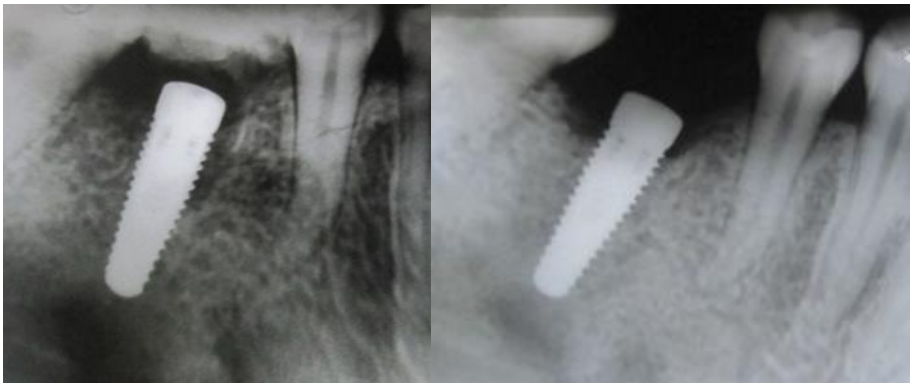


Figure 6 IOPA post 2 monthsFigure 7 IOPA post 8months

Patient was prescribed antibiotics, analgesics and Metronidazole gel for topical application and advised to continue with the mouth wash. Patient was recalled every week and after 2 months, periapical radiograph was taken to confirm bone formation [fig 6]. Patient was recalled regularly and after 8 months,periapical radiograph was again taken to authenticate bone formation all around [fig 7]. A flap was openedwhich confirmed bone formation, in mesial distal and buccal side

To avoid unnecessary torque to the implant, easy abutment [Nobel Biocare] was placed directly over the implant without any healing screw. A temporary coping Nobel Biocarewas placed over the abutment and area sutured and the patient was recalled after 1 week. The site was well healed with a thick band of attached gingival all around [fig 8]Now the area is ready for the impression procedure and the temporary coping was removed .Since abutment preparation was not done screw access plug was placed over the abutment[fig 9] and impression cap was pressed onto the easy abutment, a snap indicated that the impression cap was fully engaged and well adapted to the margin of the easy abutment [fig 10]

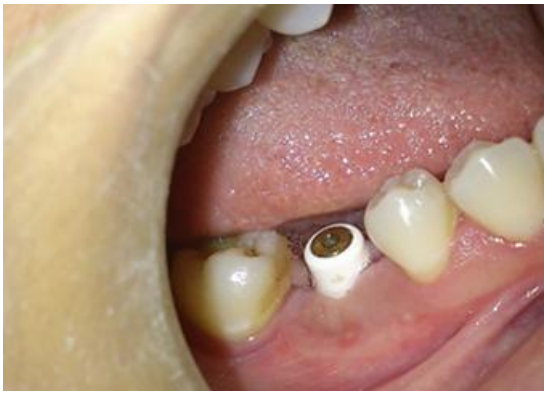


Figure 8

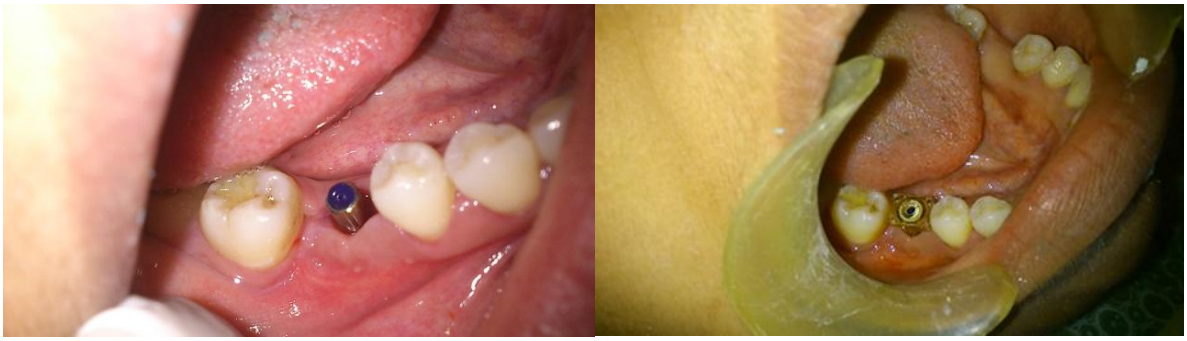


Figure 9Figure 10

Light body impression material was slowly injected into the hole on top of the impression cap until the impression materials extruded out of the lateral vent holes and a standard rubber based impression was made .When the impression was removed,the impression cap disengaged from the easy abutment and was picked up

in the impression.Cast was poured and sent to the lab for fabrications of metal ceramic crown .To avoid unnecessary stress to the implant, impression transfer coping was also not used. Crown was luted to the abutment with glass ionomer cement [fig11] Patient was advised to do only progressive loading on the implant area.Patient was recalled every month to access the crestal bonelevel and after 5 years, the site showed no further bone loss The implant and crown was functioning properly.[fig12]

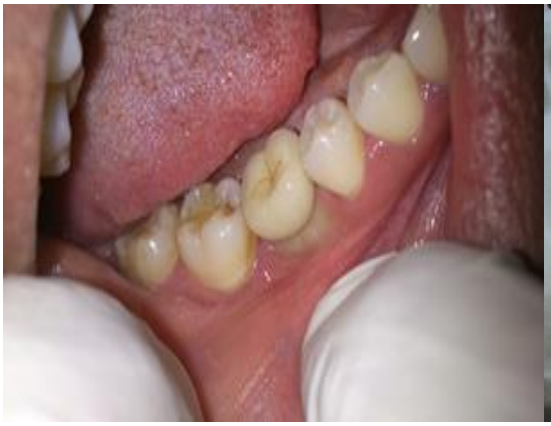
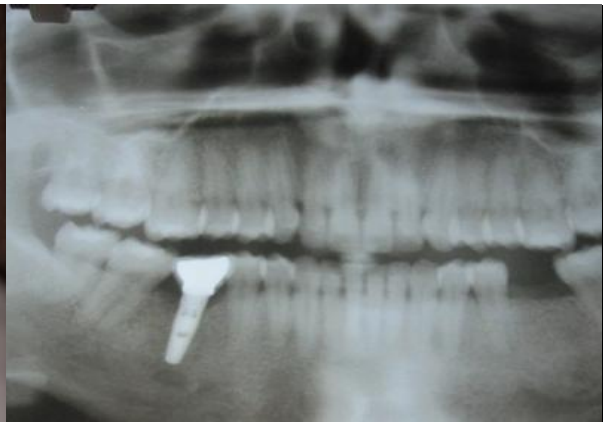


Figure 11



Figures 12.

III. Discussion

Before the initiation of treatment for a situation which is considered to be a failure, the condition of the associated implant(s) should be noted first. Albrektsson et al. [33] proposed a condition of implants which they termed as surviving. Surviving implants are those which are still in function, but which have not been tested with respect to success criteria. Meffert, in1992 classified unhealthy implants into ailing, failing and failed. [34,35]Ailing implants are those showing radio graphical bone loss without inflammatory signs or mobility. Failing implants are those with progressive bone loss, signs of inflammation but no mobility. Failed implants are those with progressive bone loss, with clinical mobility and loss of function, in the intended sense.

Early failure results from a disturbance in the initial steps of the osseointegrationmechanisms.[36, 37.] The majority of failures occurred in the preload phase (88.2%), after the occurrence of osseointegration.7.5% of the implant failures occurred after loading, and only 4.2% occurred in immediately loaded implants. This observation points to a host response role within the individual healing process.[38]Iatrogenicity was the identified cause of implant failure in 17.5% of cases. Other studies have evidenced a similar failure prevalence caused by iatrogenic factors, such as contamination, overheating, occlusal trauma, inadequate surgical technique, overloading forces [39,40]

IV. Summary

Despite high success rate with endosseous titanium implants, failures unavoidably occur. At an early stage, lack of primary stability, surgical trauma, peri-operative contamination and occlusal overload seem to be the most important causes of implant failure. Regular recall and early and timely intervention can save a failing implant and prevent traumatic experience for both the patient and the professional .Different type of treatment modalities are given in the literature The criteria for evaluation of implant failure are commonly based on clinical and radiographic alterations, which normally reflect wide pathological conditions, such as mobility, encapsulation, and local inflammation. The identification of implant loss causative and related factors can allow early intervention and minimize injury, besides increasing therapeuticalpotential, with the use of mediator analogues[41,42]

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