



DENTAL IMPLANTS FAILURES: A REVIEW

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ABSTRACT

Dental implantology is a new research continually developing to provide a better understanding of biologic principles directing the development of dynamic interface between artificial structure and the living tissue. Although having high success rates, the possible occurrence of dental implant failure is a major concern for implantologists and knowledge of such facts is clinically very essential. Diagnosis is mainly based on the clinical signs of infection like hyperplastic soft tissues, suppuration, color changes of the marginal peri-implant tissues, gradual bone loss, etc. This review article summarizes the valuable facts regarding dental implant failures.

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Dental implantology is a new research continually developing to provide a better understanding of biologic principles directing the development of dynamic interface between artificial structure and the living tissue. Although having high success rates, the possible occurrence of dental implant failure is a major concern for implantologists and knowledge of such facts is clinically very essential. Diagnosis is mainly based on the clinical signs of infection like hyperplastic soft tissues, suppuration, color changes of the marginal peri-implant tissues, gradual bone loss, etc. This review article summarizes the valuable facts regarding dental implant failures.

KEYWORDS: Dental implants, Prosthetic failures, Implant complications, Implant failures.

INTRODUCTION

Dental implants are inert, alloplastic materials that are embedded in the mandible and/or maxilla for the management of lost teeth and also to aid replacement of lost orofacial structures as a result of trauma, neoplasia or congenital defects.^[1]

Due to revolution in the research and technology of dental implants, the missing teeth replacement with dental implants for the rehabilitation of partially edentulous or total edentulous patients has now become a

standard care. Use of dental implants is mainly based on the concept of osseointegration, which was first described by the Brånemark and Schroeder.^[2,3]

For the achievement and maintenance of osseointegration in dental implants, the indications and contraindications must be balanced carefully and proper selection of patient is a key issue in treatment planning.^[2,4]

Although many studies regarding dental implant reported to have high success rate, they are not spared from complication & failure.^[5,6] There is literature available showing dental implants are more successful in the mandible than the maxilla.^[7] It has also been shown that dental implants are having more success rate in host bone than grafted bone. Although it is disappointing for the clinician and the patient to have an implant fail to integrate, the cylindrical implants show less morbidity of failure.^[7,8]

Implant failure is referred to as the status of the implant performance that when using some quantitative measurements, falls below an acceptable level.^[6] Implant failure is defined as 'the inadequacy of the host tissue to establish or maintain osseointegration.'^[1]

Direct and indirect systemic factors that can influence host response are of great relevance in the identification of risk groups for implant failure or loss.^[9]

Therefore it is very important to have full knowledge of the dental implants failures and its associated factors. The present article summarizes the important aspects related to the implants failure.

Contraindications

The contraindications for the placement of the dental implants can be divided into local and systemic/medical.² The general medical/systemic risk factors can be further subdivided into two groups:

Group 1 (very high risk)

Patients with serious systemic disease^[2]:-

Example

1. Rheumatoid arthritis, osteogenesis imperfect, osteomalacia;
2. Patients with Immunocompromised conditions (HIV, immunosuppressive medications);
3. Drug abusers like alcohol;
4. Noncompliant patients having psychological and mental disorders.

Group 2 (significant risk)^[2]

1. Patients undergone radiotherapy, severe diabetes (mainly type 1), bleeding disorders (drug-induced anticoagulation, hemorrhagic diathesis), heavy smoking habit.

The criteria for differentiation of failed and failing implant

It is very important to distinguish clinically between failed implant and failing implant. Implant mobility and peri- fixtural radiolucency characterizes the lack of osseointegration in dental implants. In this situation, the dental implant is considered to be "failed".^[6]

However, in certain cases, the failure process may be slow and continuing. Therefore, the dental implant showing progressive marginal bone loss lacking marked mobility is considered to be "failing".^[6]

Criteria for the success of dental implants

The criteria that describes the success of dental implants is continuously changing, and currently include-

1. Mobility absent at the start of the prosthetic phase,
2. Absence of continuing radiolucency around the implant,
3. Absence of periimplantitis with suppuration, and subjective complaints from the patient.^[3]

Clinical criteria for the implant failure

Infection

Infection is the most common complications that might occur during the healing period. The clinical signs include swelling, fistulas, suppuration and early/late mucosal dehiscence and may point to implant failure.^[6]

Mobility

The key sign for the failure of the dental implants is their mobility. This can present with or without distinct radiographic signs of bone changes.

The mobility can be horizontal, vertical or rotation mobility. The reverse-torque test can be helpful to discover mobile implants and the periotest device can be used for the evaluation of horizontal mobility.^[6,9,10]

Radiographic signs

These are one of the main tools for recognition of dental implants failure. For this appropriate radiographic assessment is very important, which can be done by quality of the radiographs along with the experience of the examiner.^[6,9]

Factors affecting failure of dental implants

Factors affecting failure of dental implants may be broadly classified as: implant related, patient related and surgical/ technique related. (Table 1)

Table 1: Factors in relation to the dental implants failure:14,11,24

Factor	Comments
Implant related	Surface roughness Surface purity and sterility Intraoral exposure time Fit discrepancies Inadequate dimensions
Patient related (local factors)	Oral hygiene Bone quality/ quantity Presence of natural teeth Gingivitis Periodontal status Soft tissue viability
Patient related (systemic factors)	Smoking habit Alcoholism Vascular integrity Predisposition to infection Metabolic diseases Hypersensitivity reaction to implant components
Surgical/ technique related	Premature loading Traumatic occlusion Surgical trauma Overheating Bacterial contamination Malposition/ defective angulation of implant Implant fracture Improper planning

Classification of implant failure^[11]

Truhlar classified failures as^[11]

A. Early failures

Those that occur from weeks to few months after placement caused by factors that interfere with normal healing process or by an altered healing response.

B. Late failures

Those that arise from pathologic processes that involve a previously osseointegrated implant. Heydenrifik further classified the late failure into^[11]:

- a) Soon late failures: Those occurring during the first year of loading.
- b) Delayed late failures: Implants failing in subsequent years over a period of 5 years.

CONCLUSION

At the early stage of implant placement causes like primary stability, peri-operative contamination, surgical trauma and occlusal overload seem to be the most important for implant failure. With the help of careful patient selection and proper treatment planning replacement of missing teeth with dental implants may provide long lasting aesthetic and functional restorations.

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