Complications Associated with Implant-Retained Removable Prostheses

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KEYWORDS

- Implant mechanical complications • Implant-supported overdenture
- Implant-supported removable prostheses
- Implant-supported removable partial dentures

KEY POINTS

- Implant-supported removable prostheses improve patients' satisfaction with treatment and quality of life.
- These prostheses are associated with biological and mechanical complications.
- The mechanical complications associated with implant-supported overdentures and implant-supported removable partial dentures include loss of retention of attachment systems, the need to replace retention elements and to reline or repair the resin portion of the denture and implant fracture.
- Implant-supported removable prostheses are very successful but require periodic maintenance.

INTRODUCTION

The changing demographics of the population in the United States and other Western countries have created a shift in the rates and patterns of edentulism.[1] Although the overall trend is toward a decrease in complete edentulism, the group in greatest need of complete or partial oral rehabilitation is the rapidly growing aging population. A study conducted by Douglass and colleagues[1] in 2002 concluded that, "The 10% decline in edentulism experienced each decade for the past 30 years will be more than offset by the 79% increase in the adult population older than 55 years.[1]"

Conventional complete and partial dentures have historically been the treatment options of choice for patients desiring removable prostheses. These options have been suitable for patients with limited financial resources who prefer noninvasive treatment. However, these treatment options are not without complications. In general, the

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success of conventional complete dentures depends on starting with appropriate oral anatomy, such as minimally resorbed ridges, arch forms resistant to displacement, and palate forms conducive to denture stability. Of course, obtaining the ideal oral anatomy is rarely possible, especially if a patient has remained edentulous for several years before wearing dentures. The resulting complete dentures may lack stability and retention, affecting mastication and speech, and the overall effect has been a negative on the patient's quality of life. Patients may withdraw socially if they have a fear of being unable to eat or of losing their dentures when speaking. The edentulous mandible tends to be of more concern to denture wearers than the edentulous maxilla.

Conventional partial dentures, especially those with mandibular distal extension bases, present their own set of complications, primarily rotation around the distal abutment, which creates discomfort because of an unstable denture base. This problem can call for periodic relining of the denture for the purpose of maintaining occlusal contacts and avoiding traumatic occlusal forces that cause ridge resorption or damage to abutment teeth because of the difference in resilience between teeth and mucosa.

With advances in osseointegrated implants and the success of fixed dental prostheses has come a change in treatment options for patients who desire removable prostheses but who have completely or partially edentulous ridges. Treatment options include complete or partial dentures retained by single or multiple endosseous implants, which may or may not be splinted, and a variety of attachments, such as ball attachments, Locator abutments, bar attachments, and even magnets.

A panel of subject experts at a 2002 symposium[2] in Montreal, Ontario, Canada, concluded that "The evidence currently available suggests that the restoration of the edentulous mandible with a conventional denture is no longer the most appropriate first choice prosthodontic treatment. There is now overwhelming evidence that a two-implant overdenture should become the first choice of treatment for the edentulous mandible." A subsequent statement was released after the 2009 meeting of The British Society for the Study of Prosthetic Dentistry in York, United Kingdom.[3] This panel concluded that "A substantial body of evidence is now available demonstrating that patient's satisfaction and quality of life with ISOD (implant-supported overdentures) is significantly greater than for conventional dentures." Although the ISOD has not yet been deemed the gold standard of care, it is certainly seen as the first choice for removable prostheses.

Even with the progress of implant dentistry, complications are associated with implant-retained removable prostheses. Such complications may arise from the integration of the implants themselves, or from the design of the prosthesis. Failures or complications may result from a variety of factors, such as the number of implants placed and their location. For instance, the number of implants required for a successful prosthesis may vary depending on occlusal forces and the quality and quantity of bone present. The types of attachments selected by the operator may result in various degrees of stability. The content of this article is intended to focus on the failures and complications associated with implant-retained prostheses and to provide some insight into the prevention of complications and solutions to the problems when failures do occur.

NUMBER AND LOCATION OF IMPLANTS

Overdentures

The issues associated with stability and retention of conventional complete dentures, especially those in the mandible, have resulted in new treatment options. In the 1960s,