Professional hygiene care, adjustments and complications of mandibular implant-retained overdentures: A three-year retrospective study

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Purpose. This report presents a retrospective evaluation of postinsertion care required by 104 edentulous patients with advanced mandibular bone loss.

Material and methods. The patients were treated with new maxillary dentures and mandibular overdentures retained by two implants with a single bar-clip attachment. Distinction was made between professional hygiene care, adjustments, and treatment of complications. The follow-up period after insertion of dentures was 3 years for all patients.

Results. Approximately a third of the patients needed professional hygiene care. The need for adjustments declined during the years of function. Complications were encountered in approximately a third of the patients. The majority of these were not related to the implants, but to the superstructure and both the maxillary and mandibular dentures.

Conclusions. Many edentulous patients with advanced mandibular bone loss who were treated with mandibular implant-retained overdentures need professional hygiene care, adjustments, and treatment of complications. (J Prosthet Dent 1997;78:387-90.)

CLINICAL IMPLICATIONS

This retrospective study confirms the need for routine follow-up services of hygiene care, adjustments, and treatment of complications for patients restored with implant-retained overdentures.

For this purpose, a distinction was made between professional hygiene care, adjustments, and treatment of complications.

MATERIAL AND METHODS

During the period 1988 to 1992, a group of edentulous patients with advanced mandibular bone loss who were unsuccessfully wearing conventional dentures had been referred by general practitioners to the Clinic of Maxillofacial Prosthodontics and Special Dental Care at the Dental School of the University of Nijmegen. None of the patients had implants inserted before or medical risks interfering with the treatment or with (expected) implant success. All patients received new conventional maxillary dentures and mandibular overdentures retained by two implants and a single bar-clip attachment. This treatment followed a standardized method for denture fabrication, including functional impressions with an individual tray, intraoral gothic arch registration, and lingualized occlusion. A prosthodontist and an oral surgeon proposed this treatment because no beneficial result could be expected by retreatment with conventional dentures because of advanced mandibular bone loss (class V and class VI, according to Cawood and Howell).
The number of patients needing additional professional hygiene care declined to 32 and 31 patients in the second and the third year, respectively.

Table I presents the frequencies of adjustments during the 3 subsequent years of function. The incidence of tightening screws and abutments declined from 33 times in the first year to 7 times in the third year, whereas the incidence of abutment replacement increased from 6 patients in the first year to 18 patients in the third year. Treatment of decubital ulcerations was frequently needed (46 times). Finally, minor occlusal adjustments were needed in 17 patients, activation of retentive clips had to be carried out in 21 patients, replacement of resilient components was needed in 16 patients, correction of denture borders had to be carried out 24 times, and fractures of artificial teeth occurred in 12 patients. The need for adjustments declined during the years of function.

Complications occurred in 36 patients during the first year, in 29 patients during the second year, and in 26 patients during the third year of follow-up. Of these patients, 8 had complications in more than 1 follow-up year. The frequencies of these complications and treatments are shown in Table II. In one patient (1.0%), an implant was lost. This failure occurred 6 months after overdenture insertion. The failing implant was replaced. During the healing period of this new implant, the patient was not able to function with an implant-retained overdenture. Therefore the patient was left out of the results from the second and third year of follow-up. In six patients, abutment fracture occurred. In all these cases, abutments with resilient components were involved.

Mechanical problems related to the superstructure were present in 6 patients. Acrylic resin fractures were
Therefore, treatment results of implant-retained prostheses because of advanced mandibular bone loss. Moreover, since 1989, oral rehabilitation with dental implants is included in the Dutch National Dental Insurance scheme for patients with advanced bone loss, but it is restricted to implant-retained overdentures. Therefore, treatment results of implant-retained overdentures and implant-retained fixed prostheses cannot be compared.

Loose screws and abutments were the most common mechanical problems in this study. However, the frequency of loose screws and abutments decreased during the 3 follow-up years, whereas an increasing frequency of abutment replacement was noted. An explanation for this phenomenon is that, in our clinic, abutments with a resilient stress-absorbing component were frequently used some years ago. It is known that the clinical durability of this resilient component, known as the intramobile element (IME), is approximately 1 year, and fatigue and fracture is no exception. During the follow-up years, frequent loosening and sometimes fractures of intramobile elements occurred. Because of these problems, IMEs were replaced by rigid titanium abutments. The frequency of loosened or fractured abutments decreased when a titanium abutment was used. The replacement of IMEs by rigid abutments may also account for replacement or resoldering of superstructures. Because of its resilience, the IME can obscure misfits and conceal the stress being created. Replacement or resoldering of bars was needed in three patients after replacement of intramobile elements by titanium abutments. If rigid titanium abutments had been used at baseline, less complications would probably have been present.

Unlike other studies, which reported several acrylic resin fractures for overdentures supported by oral implants as well as natural tooth abutments, no acrylic resin fractures occurred in this study's patient sample. An explanation for this phenomenon could be that during the overdenture treatment, attention was given to sole support by the bar-clip attachment, or in other words, absence of direct contact between denture base and implants. In this way, the implants cannot act as fulcrum points, resulting in fatigue resin fractures.

Treatment of decubital ulcerations and relinings of maxillary dentures were frequently needed, especially in the first year of function, which corresponds closely to the report of Walton and MacEntee. It is likely that complete maxillary dentures opposed by implant-supported overdentures are subjected to higher occlusal forces and are more easily dislodged, so that adequate retention is more difficult to achieve. Moreover, the patient sample in this study included patients with unfavorable maxillary ridges.

Finally, a small number of patients with psychologic problems and patients with insufficient oral hygiene that resulted in peri-implant problems required additional attendance, even in the third year of function. However, these patients benefit from implant-retained overdentures, although time spent and costs are higher.

A randomized clinical trial on patients receiving either implant-retained mandibular overdentures or implant-retained fixed prostheses would be desirable in the future to make a detailed comparison between both groups regarding surgical results, prosthodontic treat-
mments, laboratory procedures and postinsertion care, and treatment of complications.

CONCLUSIONS

In 1.0% of the patient population with advanced mandibular bone loss who were treated with implant-retained mandibular overdentures, implant failure occurred. Approximately a third of the patients needed professional hygiene care. The need for adjustments declined during the follow-up period. Tightening of loose screws and abutments, treatment of decubital ulcers, and correction of denture borders were the most common adjustments. Complications occurred in approximately a third of the patients. The majority of these were not related to the implants, but to the superstructure and to both the maxillary and the mandibular denture. The results of this clinical retrospective study suggest that many edentulous patients with advanced mandibular bone loss treated with mandibular implant-retained overdentures need professional hygiene care, adjustments, and treatment of complications.

REFERENCES


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