

A case report of a removable denture using magnetic attachments for a missing mandibular molar with a decreased occlusal vertical dimension followed up for 3 years

M. Sone

Division of Removable Prosthodontics, Department of Restorative and Biomaterials Sciences, Meikai University School of Dentistry

Abstract

This case report describes our establishment of an appropriate OVD for a patient with a decreased OVD to restore aesthetics and function by using magnetic attachments.

As the definitive prosthesis, a maxillary removable overlay denture with coping-type magnetic attachments and a horseshoe plate as the major connector was fabricated, and a mandibular removable partial denture with an extracoronal-type magnetic attachment was also fabricated.

Three years after the denture setting, the definitive prosthesis has been used without any problems, and the magnetic attachment has had no clinically significant loss of retention.

Introduction

To maintain a harmonious craniofacial system, it is essential to establish an appropriate occlusal vertical dimension (OVD).¹⁾ This case report describes our establishment of an appropriate OVD for a patient (Eichner B3: missing mandibular molar) with a decreased OVD to restore aesthetics and function by using magnetic attachments.

Clinical History

The patient, a 59-year-old female, complained of aesthetic dissatisfaction and masticatory dysfunction. The patient had a partially edentulous maxilla (Eichner B3: missing mandibular molar). All fixed prostheses were failed restorations with a marginal discrepancy that had been damaged by caries and periodontal disease. The patient refused to wear a mandibular removable partial denture because of dissatisfaction with a visible metal clasp on the anterior teeth. She was diagnosed with infraocclusion by analysis of her OVD (Fig.1). We suggested that a mandibular removable overlay denture with coping-type magnetic attachments and a maxillary removable partial denture with extracoronal-type magnetic attachments and porcelain fused to metal crowns should be fabricated that would be acceptable to the patient.



Fig.1 Intraoral view at the initial examination

Treatment Procedure

First, the prostheses with marginal discrepancies were removed (Fig.2), and temporary restorations were placed. The 3 and 12 teeth were extracted because of severe caries. After pre-prosthetic treatment, the OVD was increased using a treatment denture, and the patient obtained an adequate occlusal relationship (Fig.3).

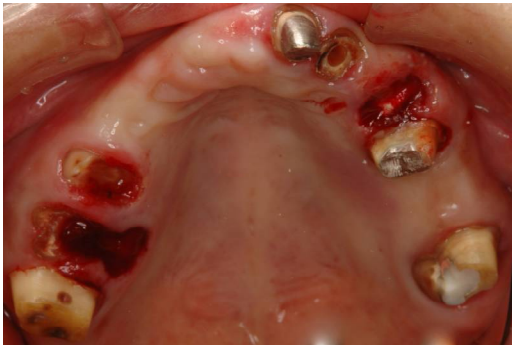


Fig.2 Intraoral views of removing the prostheses with marginal discrepancies



Fig.3 Intraoral views of inserted temporary restorations and treatment denture

As definitive prostheses, a maxillary removable overlay denture with coping-type magnetic attachments and a horseshoe plate as the major connector was fabricated (Fig.4), and a mandibular removable partial denture with an extracoronal-type magnetic attachment was also fabricated (Fig.5). The magnetic attachments used in this case report were GIGAUSS C400® (GC, Japan). The keepers of the magnetic attachments and magnetic assemblies were fixed with adhesive resin cement (Multilink® Automix, Ivoclar Vivadent AG, Liechtenstein) (Figs.6 and 7). Figure 8 shows an intraoral view of the definitive prostheses.



Fig.4 Maxillary removable overlay denture



Fig.5 Mandibular removable denture



Fig.6 Occlusal view of abutment teeth



Fig.7 Extracoronary-type magnetic attachments



Fig.8 Intraoral view of definitive prostheses

Outcome of Treatment

Three years after the denture setting, the definitive prostheses have been used without any problems, and the magnetic attachments have had no clinically significant loss of retention (Fig.9).

In the interval, the remaining dentition, periodontal condition, and retentive forces of the prostheses have been examined as part of the maintenance program (Fig.10).



Fig.9 Intraoral view of the definitive prostheses 3 years after treatment



Fig.10 Maintenance program

Efficiency of oral hygiene was evaluated using the Plaque Control Record (PCR) method. In this case, the PCR was 88.5% at the first visit and had improved to 20.8% (Fig.11) in the 3 years after treatment.

The Oral Health Impact Profile (OHIP) questionnaire is one of the most technically sophisticated instruments for assessing oral-health-related quality of life (OHRQoL). Additionally, the OHIP-14, a short version of the OHIP, is seen as most appropriate for edentulous patients.²⁾ The OHIP-14 total score in this case was 41 at the patient's first visit and, 3 years after setting the removable denture with magnetic attachments, had improved to a score of 21 (Fig.12).

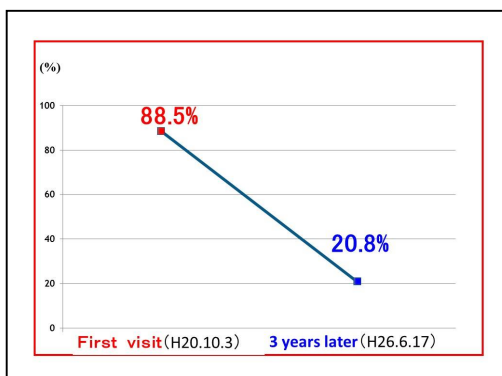


Fig.11 Plaque Control Record

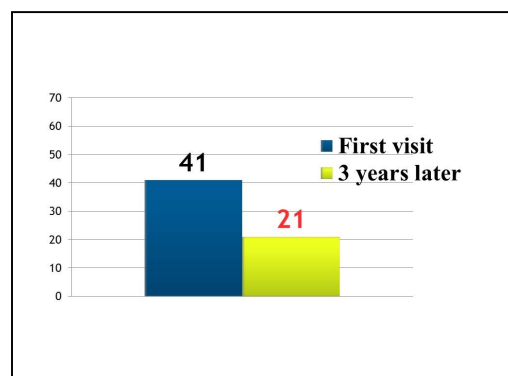


Fig.12 Oral Health Impact Profile-14 for Japanese

Conclusions

A magnetic attachment could be provided as a useful retentive appliance for alleviating patient complaints regarding aesthetics and function. It is difficult to maintain an ideal combination of aesthetics and functionality because the design of a final prosthesis is complex. Therefore, continuous follow-up is necessary with occlusal adjustment and relining of the denture base to prevent any OVD reduction.

References

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2. F. Allen, D. Locker: A modified short version of the oral health impact profile for assessing health-related quality of life in edentulous adults, *Int J Prosthodont* 15, 446-450, 2002.