

A case report of a removable partial denture with magnetic attachments on the proximal surfaces of abutment teeth

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Introduction

Overdentures with magnetic attachments are a prosthetic approach that can restore masticatory ability and provide a highly aesthetic appearance, but they are difficult to apply to vital teeth. We will report a case of a removable partial denture (RPD) with magnetic attachments applied to the proximal surfaces of the abutment teeth to minimize invasion of the tooth structure.

Case report

1. Patient Information

The patient is an 80-year-old female with remaining mandible teeth #48, #42~#34, and #38. She was suffering from mastication difficulty and poor aesthetics due to metal clasps on the anterior teeth, and she requested the least invasive prosthetic treatment. Radiographic findings showed #24 root fracture.

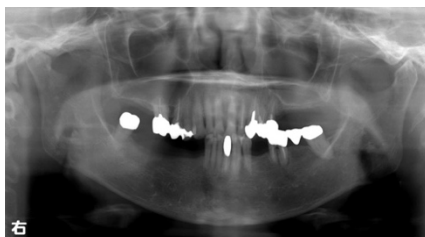


Fig. 1 Panoramic radiograph at the first examination



Fig. 2 Intraoral photograph at the first examination



Fig. 3 Placement of existing removable partial denture

2. Repair of additional teeth on existing denture

The existing RPD could not be used because the metal crowns (#24, #25) were detached. After #24 was extracted due to root fracture, the maxillary existing RPD was repaired with additional resin teeth (Fig. 4).



Fig. 4 Existing maxillary RPD after repair with additional resin teeth

3. Treatment plans

3.1 Delivery of maxillary titanium RPD with magnetic attachment with cast metal coping

A magnetic attachment with a cast metal coping was placed on the root of #25 where the Cr had become detached with the core. A titanium RPD with a half clasp on #23 and a cast clasp on #14~#16 was fabricated (Figs. 5-7).

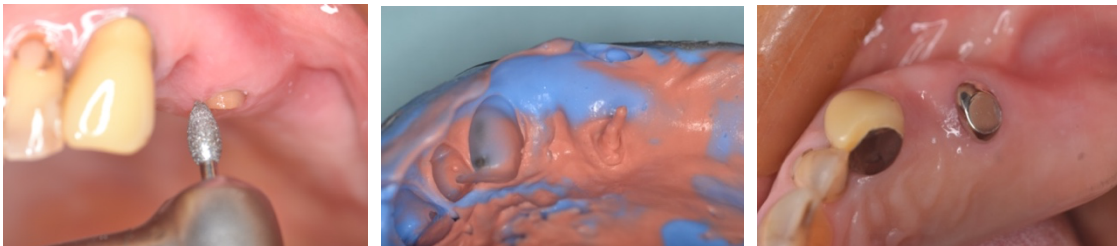


Fig. 5 #25 Tooth preparation, impression taking, placed magnetic attachment with coping

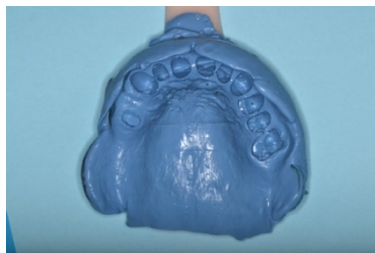


Fig. 6 Definitive impression of the maxilla



Fig. 7 Definitive maxillary RPD

3.2 Magnetic attachments placed on the proximal surfaces of the abutment teeth in the mandible

To avoid a non-aesthetic metal clasp on the anterior teeth, the keepers were fixed to the proximal surfaces of the abutment teeth (#34 and #42) using composite resin. A keeper fixation part was fabricated on the working model using optical transparency composite resin (Fig. 8).



Fig. 8 Fabrication of composite resin parts for keeper fixation

3.3 Abutment teeth preparation using a preparation guide

Figure 9 shows the retentive forces when the magnetic attachments were applied to the proximal surfaces of the teeth with various angles of both keepers. The preparation guide was readied on the model in advance of preliminary treatment of the abutment tooth-forming surfaces (Fig. 10).

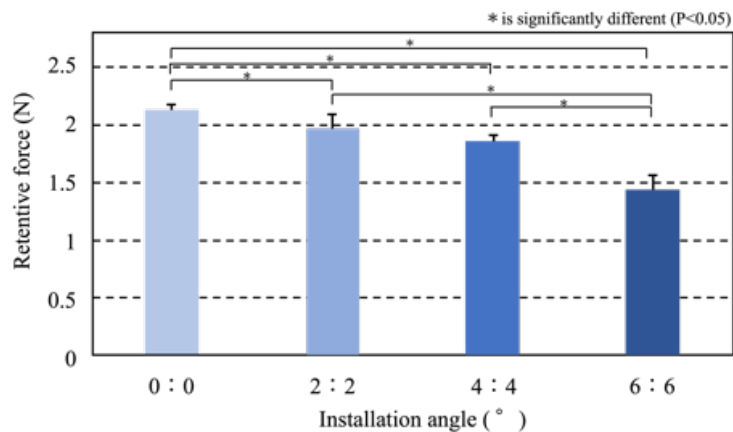


Fig. 9 Retentive forces when the magnetic attachments were applied to the proximal surfaces of the teeth with various angles of both keepers¹



Fig. 10 Readyng the abutment teeth using a preparation guide

3.4 Keepers were attached to the proximal surfaces

Two keepers were attached to the proximal surfaces of #34 and #42 using composite resin (Fig. 11).



Fig. 11 Keepers attached with composite resin

3.5 Fabrication of a mandibular RPD framework

The mandibular denture framework was conventionally fabricated with a lingual plate. A cap clasp and a ring clasp were placed on #48 and #38, respectively (Fig. 12).

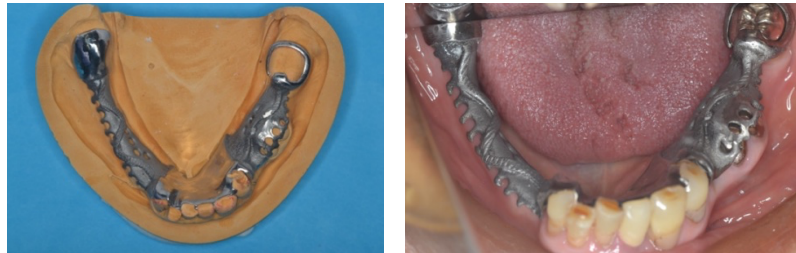


Fig. 12 The completed RPD framework

3.6 Completed definitive mandibular RPD (Figs. 13–14)



Fig. 13 Occlusal view of the definitive RPD

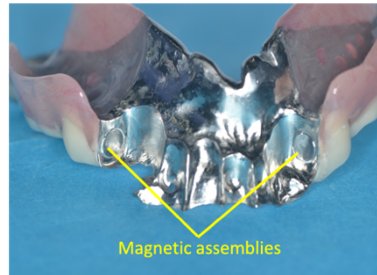


Fig. 14 Magnetic assemblies were placed in the proximal plates of the RPD.

3.7 Delivery of the definitive mandibular RPD (Figs. 15–16)



Fig. 15 Intraoral view of definitive maxillary and mandibular RPDs

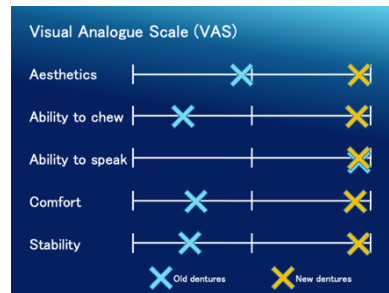


Fig. 16 Assessment of previous and definitive dentures by VAS

Discussion/conclusion

Magnetic attachments were applied to the proximal surfaces of the anterior teeth to improve the aesthetics with a minimally invasive treatment. The patient was fully satisfied with the aesthetics and the assurance of adequate retentive force.

References

1. Yoshiya Miyama, Masahiro Yamaguchi, Yukihiro Mizuno, Fujio Tsuchida, Norio Takishin, Minoru Abe, and Toshio Hosoi. Studies on the retentive force of the magnetic attachment applied on the proximal surface, part 1. The Journal of the Japanese Society of Magnetic Applications in Dentistry. 2008; 17(1): 30–35.