Denture repair by applying a magnetic attachment after extracting the abutment tooth of a cone crown telescope: A case report

A.izumida

Department of Comprehensive Dentistry, Tohoku University Hospital

Abstract

In this case report, a denture was repaired by applying a magnetic attachment after extracting the abutment tooth of a cone crown telescope. The patient was a 76-year-old female. She wore a denture with a cone crown telescope for three missing teeth: the left central incisor, the lateral incisor, and the canine. The second premolar on the left side of the maxilla, one of the abutment teeth, was extracted due to root fracture. Subsequently, a full metal crown with an extracoronal magnetic attachment was affixed to the maxillary left first molar behind the defect. Denture repair was performed by adding a magnetic attachment to the inner surface of the outer crown of the second premolar on the left side of the maxilla to match the keeper of the extracoronal magnetic attachment. The patient was satisfied with using the repaired denture. In addition, by adopting an extra-crown attachment, it was possible to reduce the burden on the abutment tooth.

Introduction

In recent years, dental magnetic attachments have become easier to handle in general clinical practice due to their miniaturization, retentive force, improved corrosion resistance, and the fact that they can also be applied to extracoronal magnetic attachments. Another advantage is that, with a little ingenuity, there are various ways to use them.

In this case, one of the abutment teeth of the removable partial denture was extracted. The full metal crown of the existing tooth at the extraction site was made into a full metal crown equipped with an extracoronal magnetic attachment, and the denture was repaired by affixing a magnetic attachment to the inner surface of the denture so as to fit the keeper.

Outline of the case

The condition of the prosthetic device in the oral cavity at this patient's first visit was shown in the previous report, [1)] but the basics are given below.

The patient was a 77-year-old female. On June 12, 2020, she came to the hospital complaining of upper left pain during occlusion. Intraoral views and the denture are shown in Figure 1. As a general medical history, the patient was being treated for hypertension.

Fig.1 Intraoral views and the denture at the beginning of prosthetic treatment

Her current dental history is as follows. In December 2000, inner crowns of the cone crown telescope on the maxillary right central incisor, left first premolar, and left second premolar were produced for three tooth defects. A removable partial denture equipped with outer crowns conforming to those inner crowns was then set. In November 2014, the inner crown of the maxillary right central incisor, one of the abutment teeth, was removed for root canal treatment due to acute apical periodontitis. In July 2015, after endodontic treatment, the maxillary right central incisor was repaired by fitting a magnotelescopic crown (MT crown) with a magnetic attachment to fit the existing outer crown.

The current disease is as follows. The second premolar on the left side of the maxilla, which was the focus of the main complaint, had occlusal pain for about 3 weeks; additionally, red swelling was observed in the buccal gingiva, the tooth mobility was second grade, and the periodontal pocket depth was 9 mm at the deepest point. A dental photograph of the second premolar on the left side of the maxilla is shown in Figure 2. A root fracture extending to the apex was found, and the tooth was judged to be unsavable, so it was extracted on June 30.

Fig. 2. Dental radiograph

Clinical procedure

In planning the prosthetic treatment, the following factors were considered: The denture had been used for a long time, but the fit of the denture was good, and the patient could use the denture comfortably. Therefore, the prosthetic treatment plan after tooth extraction was shown as follows and was accepted by the patient:

(1) Fabricate a provisional crown with an extracoronal attachment after removing the full metal crown of the maxillary left first molar.

(2) Produce a full metal crown with an extracoronal magnetic attachment keeper after the residual ridge being stable.

(3) Mount the magnetic assembly on the inner surface of the outer crown of the second premolar on the left side of the maxilla.

(4) Maintain and recall.

Treatments were performed as follows.

A provisional crown with extracoronal attachment to the maxillary left first molar was made by applying a bent ready-made rest wire to the outside of the crown. The extracoronal attachment was fitted to the inner surface of the outer crown of the second premolar on the left side of the maxilla (Fig.3).

Fig. 3. Intraoral views, the denture and the provisional crown

Working casts without the denture (Fig.4①) and with the denture (Fig.4②) were prepared for the production of a full metal crown with the extracoronal attachment. In this case, since it was used on the inner surface of the outer crown of the second premolar on the left side of the maxilla, GIGAUSS C400® (GC, Japan) was used as the magnetic attachment, and the extracoronal attachment was manufactured by the keeper bonding method.

The crown morphology was waxed up in consideration of the following points (Fig.4③). The mesial surface was adapted to the distal surface of the second premolar on the left side of the maxilla of the model with denture. The part of the extracoronal attachment in contact with the mucosal surface was fitted with a dentureless model. For the pedestal to which the keeper of the extracoronal attachment is affixed, a model with denture was used, and wax-up was performed on the model in which the occlusal surface was ground, leaving the axial surface of the second premolar on the left side of the maxilla. The wax pattern was buried and cast according to the conventional method, and then the cast body was adjusted and polished (Fig.4④).

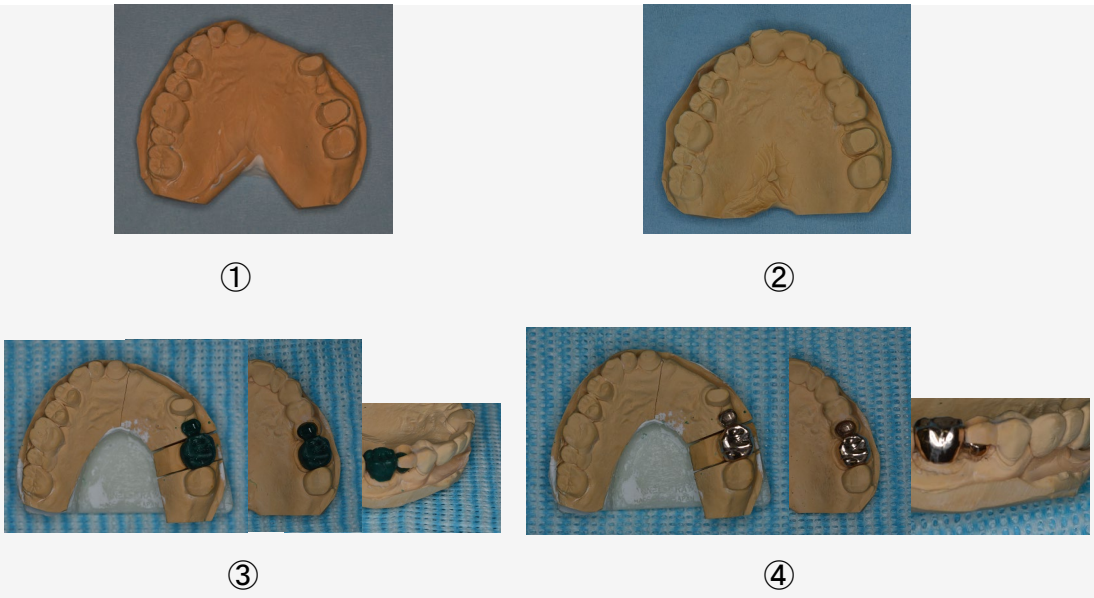

Fig. 4. Fabrication process from the wax-up of the first molar tooth to the completion of the full metal crown with an extracoronal magnetic attachment

The full metal crown with an extracoronal attachment was set in the oral cavity. At the next visit, a magnetic attachment was fitted to the inner surface of the outer crown of the second premolar on the left side of the maxilla (Fig.5).

Fig. 5. Intraoral views and the denture at the wearing of the magnetic attachment

Discussion

In this case, by extracting the second premolar on the left side of the maxilla, the Kennedy classification is type 1 of Class III, and the Eichner classification is B-1. Including the maxillary right second molar that had already been missing, 5 teeth were missing. Since there was no defect in the mandible, the number of teeth decreased from 24 to 23, and the number of occlusal supports decreased from 10 to 9. In Miyachi's occlusal triangle, the area changed from the first area to the second.[2)] However, the patient had 9 occlusal supports and 23 teeth, had no tooth loss for the past 21 years, and she had more teeth and occlusal supports than other people of her generation. As a result of considering these factors, it was judged that the minimum prosthetic treatment was possible in this case.

Regarding the maxillary left first molar, the periodontium was generally good, and the pocket depth was about 3 mm, although the margins of the full metal crown were incompatible.

The patient was using the denture well and strongly hoped to continue using it. Therefore, she was relatively reluctant to make new dentures. In this case, the purpose of prosthetic treatment was to use the existing denture as much as possible while not placing an excessive burden on the abutment teeth. When she was presented a treatment plan using a full metal crown with an extracoronal attachment, she gave her consent to the treatment plan. [3)]

Conclusions

As a prosthetic treatment after tooth extraction, the existing full metal crown of the existing tooth was remade into a full metal crown with an extracoronal attachment. The existing denture was repaired by setting a magnetic attachment on the inner surface of the outer crown of the denture to fit the keeper. By using the existing denture, we enabled the patient to use the repaired denture without discomfort and with high satisfaction. In addition, the use of a magnetic attachment could reduce the burden on the abutment teeth.

References

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