

Esthetica sectional denture with magnetic attachment: a case report

Shibata S¹⁾, Matsumoto T²⁾, Ohkubo C¹⁾

¹ Department of Oral Rehabilitation and Prosthodontics, Tsurumi University School of Dental Medicine

² Department of Dental Technician Training Institute, Tsurumi University School of Dental Medicine

I. Introduction

Currently, non-metal clasp denture are commonly used for esthetically demanding patients, to avoid exposure the metal clasp on the labial side of the abutment teeth. However, the rigidity of conventional non-metal clasp denture would be insufficient, it may have a negative impact the prognosis of the abutment teeth¹⁾.

Denture design based on the rigid support must be necessary to minimize the denture mobility²⁾.

II. Case report

1. Patient information

The patient was a 75 years old woman. She came to our hospital with a chief complaint of esthetic defect due to detachment of anterior crown from the abutment tooth. Her #13 anterior resin crown and post core were detached in December 2021. There was little structure of remaining tooth, and root fractures was also observed. Fixed implant prostheses were placed at #23,#24 in 2005 and #47,#46,#45 in 2015, respectively.

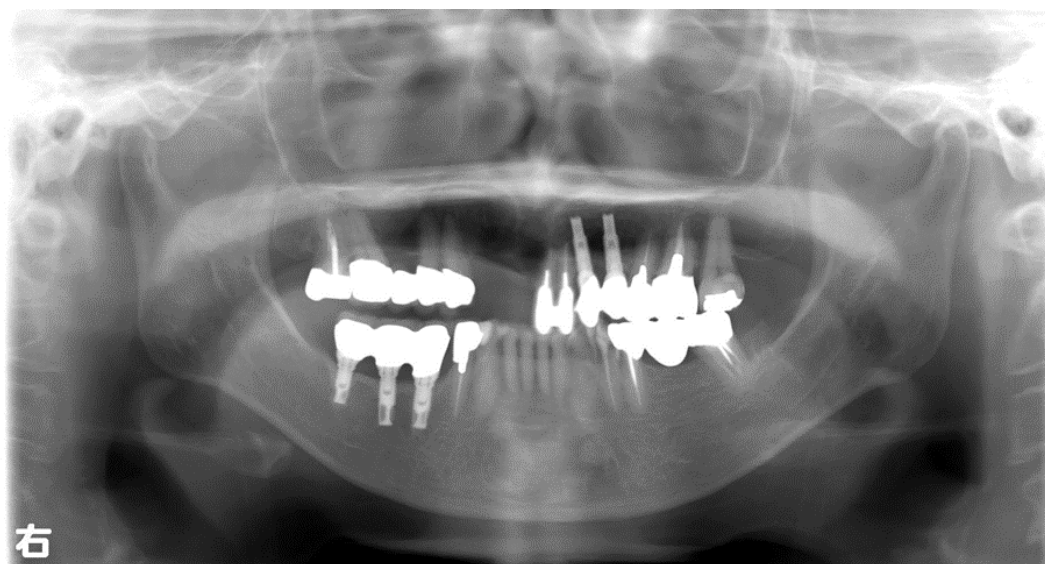


Fig.1 Panoramic radiograph after teeth extraction #12and#13



Fig.2 Intraoral views after teeth extraction #12 and #13

2. Treatment plans

After #12 and #13 were extracted, a non-metal clasp denture was placed as an immediate denture (Fig.3). Since the amount of remaining bone was insufficient, bone augmentation must be necessary for implant placement, she did not accept implant treatment. Therefore, we proposed a metal base removable partial denture (RPD) without metal clasp existing on the labial side for esthetic reasons.



Fig.3 Non-metal clasp denture as a immediate denture

III. Denture fabrication

1. Denture design

Rests were placed on proximal occlusal surfaces of the #14, #15, and #24 for the support. Guide planes were prepared on the palatal side of #15, #14, and #21~#24 to obtain the bracing. Using the undercut below the adjacent surfaces of the #14 and #21, labial sectional part was fitted for the retention. Labial sectional part and main palatal framework were connected and fixed using magnetic attachment on the sectional surface³⁾(Fig.4).

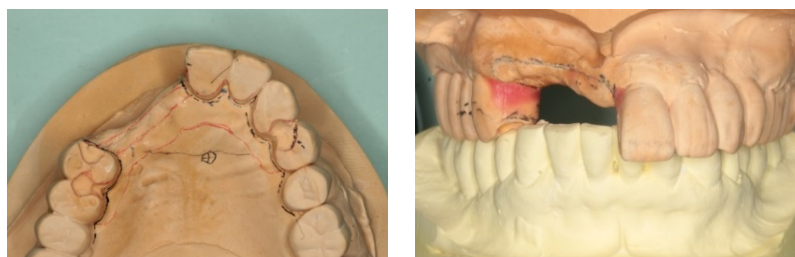


Fig.4 Working cast

2. Fabrication of framework

Main palatal framework and movable part with Choix Swing Wedge Attachment (Fig5- a, b) were cast of Co-Cr alloy, and two castings were joined by laser welding (Fig.5-c). A rotational movable plate was cast of sgold-silver-palladium alloy and then it was integrated to main framework with orthodontic 0.9 mm round wire (Fig.5-d).



Fig.5-a

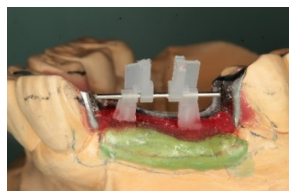


Fig.5-b



Fig.5-c



Fig.5-d

Fig.5 Framework fabrication

3. Framework try in

The completed framework was tried in the oral cavity to check the fitness, movement of the swinging wedge attachment, and the retention was confirmed. The occlusal contacts at centric occlusion and during eccentric movement were given on the metal up regions and rests of the framework to avoid stress to the swinging wedge attachment hinges.(Fig.6)



Fig.6 Intraoral views of framework

4. Placement of magnetic attachment

A keeper (Physiomagnet, Kedica??) was placed on the sectional surface of the movable plate using adhesive resin cement (Panavia V5, Kurare?) (fig.7-a). The magnetic assemble (Physiomagnet, Kedica??) was fixed on the palatal side of the main frame. After artificial incisors were arranged and fixed using hybrid resin (???, GC?) (Fig7-b), and the denture base was characterised with stain (???, GC?) (Fig8).

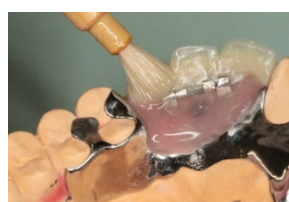


Fig.7-a,b Fixation of magnetic assembly

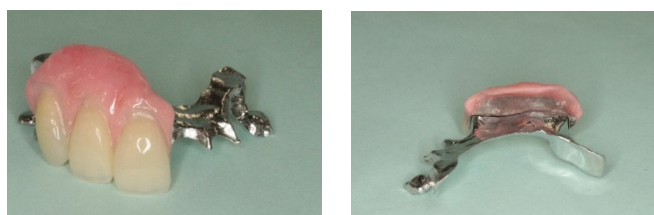


Fig.8 Completed sectional denture

IV. Denture delivery

1. Confirmation on the working cast

Before delivery, the adjacent surface of the denture base fitted to the undercut below the adjacent surface was confirmed on the working cast by opening (Fig.9-a) and closing (Fig.9-b) the sectional part, .



Fig.9-a Opening the sectional part

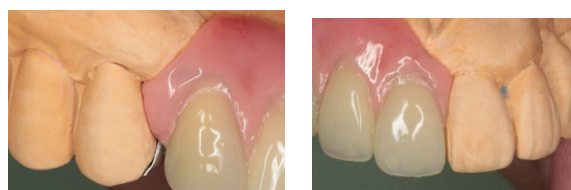


Fig.9-b Closing the sectional part

2. Denture placement

The sectional denture was placed with great accuracy without pain on the abutment teeth and the mucosa, including during placement and removal. The sectional part did not open or close during mandibular movements. Patient highly satisfied of esthetics and function to the sectional denture (Fig.10).



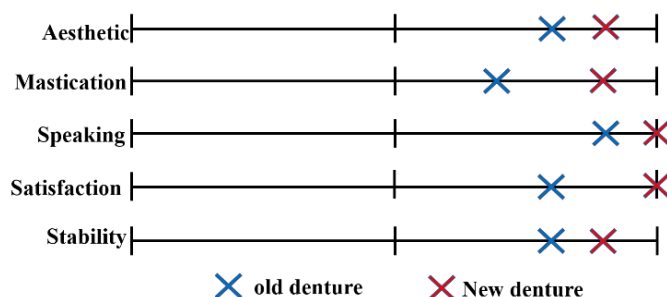
Fig.10 Placement of sectional denture

3. Observation

Intraoral views of denture placement and subjective evaluation to the new denture at one month after denture delivery were shown in Figs 11 and 12, respectively. The OHIP-J14 and the VAS showed higher level of patient satisfaction. No problems were observed about the denture and the abutment teeth for ten months after delivery.



Fig.11 Intraoral views of one month after denture delivery



OHIP-J14: 4 point

Fig.12 Visual Analogue Scale

V. Discussion/Conclusions

The application of magnetic attachments to fix the sectional components to obtain the retention during function. To avoid the stress on the swing wedge attachment hinge section, the occlusal contacts during central occlusion and eccentric movement were given to the palatal metal up regions and rests of the framework. The sectional metal base denture indicated the highly esthetic without exposing the metal clasp on the labial side. These factors might contribute to the high level patient satisfaction. We intend to continue to provide adequate maintenance including plaque control and force control.

References

- 1) Tsuzuki T et al, The trouble incidence in patients with non-metal clasp denture: A retrospective observational study, J Fukuoka Dent Coll. 2019;44(4):129-134.
- 2) Ohkubo C et al, The current state of non-metal clasp dentures and prosthetic considerations, Practice in Prosthodontics 2012;45:504-514.
- 3) Watanabe I et al, Application of cast magnetic attachments to sectional complete dentures for a patient with microstomia: a clinical report, J Prosthet Dent 2002;88:573-7.