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(CASE REPORT)

Rehabilitation for partial tooth loss of the upper jaw accompanied by tooth abrasion : A case report

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Abstract

Background: When tooth loss is not replaced can cause difficulty in chewing and speaking, Tooth loss can have an impact on the decline of stomatognathic function and aesthetic, which indirectly affects a person's quality of life. Therefore, replacing lost teeth is essential prevent these complications and restore function and appearance. Metal framework RPD is a treatment option has excellent mechanical qualities.

Objective: To rehabilitate partial tooth loss of the upper jaw with metal frame removable partial denture.

Case Report: A 72 years old female patient came to prosthodontics specialty clinic at Universitas Airlangga Dental hospital with a chief complaint to replace her upper right and left posterior teeth which are lost due to extraction so she can eat properly. The teeth was extracted 3 months ago due to cavities and swelling. The patient reported to have had used partial denture for the past 4 years and currently cannot use them anymore because of the many teeth missing. The treatment chosen for this case is metal frame removable partial denture

Conclusion: Metal frame RPD provides satisfaction to the patient and improve aesthetic and function.

Keywords: RPD; Metal frame prosthesis; Tooth loss; Prosthodontics; Aesthetic; Dentistry

1. Introduction

Tooth loss can have an impact on the decline of stomatognathic function and aesthetic, which indirectly affects a person's quality of life. Patients undergo denture treatment to improve their appearance, improve speech function, confidence, and appearance, also to maintain the ability to chew more comfortably; and to maintain the remaining teeth [1]. OHRQoL is greatly impacted by tooth loss. According to a research that used the Oral Health Impact Profile (OHIP-14), the more teeth lost, the higher the OHIP-14 scores, which indicates more impairments in oral health. The highest ratings were recorded by those who had lost more than ten teeth, indicating significant negative impacts on their quality of life. In particular, social disabilities and functional limits were significantly impacted, with statistical significance noted in both of these instances [2].

The primary approach for replacing missing teeth is to use partial removable dentures. Long span edentulous, teeth without a distal abutment, and teeth with more serious periodontal support issues are treated with removable partial dentures (RPD). There are two kinds based on the main component of RPD: metal frames and acrylic resin. Dentures made of both materials can be used to replace missing teeth [3]. Removable partial dentures, in this case metal frameworks (RPDs), are one of several treatment options to in replacing missing teeth in cases of partial edentulousness that is proven to effectively restore function and aesthetics [4].

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Metal frame partial dentures usage is less popular than that of acrylic dentures due to their relatively high cost. As metal frame partial dentures can be made smaller, narrower, and more rigid, they are essentially better than acrylic dentures. The material improves mastication forces and heat transmission. Additionally, metal frame partial dentures have excellent mechanical qualities and preserve the abutment teeth's periodontal tissues [5]. This case report discus the handling of a partial edentulous case with metal frame removable partial denture.

2. Case Report

A 72 years old female patient came to prosthodontics specialty clinic at Universitas Airlangga Dental hospital with a chief complaint to replace her upper right and left posterior teeth which are lost due to extraction so she can eat properly. The teeth was extracted 3 months ago due to cavities and swelling. The patient reported to have had used partial denture for the past 4 years and currently cannot use them anymore because of the many teeth missing. On intraoral examination it was found that, the patient was missing teeth 18,17, 16, 15, 25,26, 27, 27, 38, and 37. Abrasion are found on teeth 14, 13,12, 22, 23, 24. An extraoral examination showed the face was ovoid in shape; patient's eyes, nose, and lips are symmetrical. On the radiographic examination, radiopaque images on the cervical of tooth 14; radiopaque images of dental crown and root canal and well-defined radiolucent lesion on the periapical on tooth 36; radiopaque images of dental crown on teeth 34, 33; impacted tooth 48; and missing teeth 18,17, 16, 15, 25,26, 27, 27, 38, and 37. Following a comprehensive intraoral, extraoral, and radiographic assessment, a decision was made to rehabilitate the missing teeth by using metal frame removable partial denture.

Figure 1 Extraoral Examination

Figure 2 Panoramic Radiograph Examination

Figure 3 Intraoral Examination, view from the frontal (A), right side (B), left side (C), occlusal maxilla (D), and occlusal mandible (E)

3. Case Management

Preliminary impression of maxilla and mandible were taken with stock tray using irreversible hydrocolloid on the first visit to make a diagnostic cast. Then, preliminary casts were made by pouring type III dental stone into the preliminary impression. Following that, diagnosis, survey, and block out were conducted to finalize the treatment plan.

The patient was given the information regarding the final treatment plan. The patient was advised to do a scaling as well as treatment in conservation field on teeth 13, 12, 22, 23 using composite material and porcelain fused to metal crown on teeth 14 and 24. Scaling was performed as the preliminary treatment once the patient approved the suggested course of treatment, followed by Composite filling in teeth 13,12, 22, 23.

Figure 4 Trial insertion on patient

Preparations for porcelain fused to metal crowns on tooth 14 and 24, the PFM crowns will later be milled with rests, because they are part of the removable denture design. After the preparation is complete, the abutment tooth

impression is made using polyvinylsiloxane impression material, putty type and low viscosity using putty-wash/two-step impression technique. The temporary crown was created using a putty impression and composite-based temporary crown and bridge making materials. The impressions obtained was then sent to the lab to fabricate the porcelain fused to metal crowns on tooth 14 and 24 and the metal framework for the removable partial denture. Afterwards, PFM crown trial on teeth #14 and 24. Temporary crown installation was done using freegenol temporary cement, GC

Creating a maxillary working cast with the metal framework using polyvinylsiloxane (PVS) impression material, combining putty and low-viscosity consistencies, utilizing the one-step impression technique. The impressions were then sent to the lab and arrange the acrylic tooth elements on the metal framework base. Later on, Clinical evaluation was done after a week which shown good clinical condition.

Installation of PFM crowns on teeth 14 and 24 using permanent cement, GIC type 1, GC, followed by trial of dentures on patients, final contour of removable dentures, acrylic processing, initial polishing of dentures, selective grinding, and final polishing. Next is the insertion of dentures in the patient, good retention, stabilization and occlusion were obtained on the prosthesis. The patient was then given instructions on how to wear and care for the denture, and to come to the next visit one day post insertion.

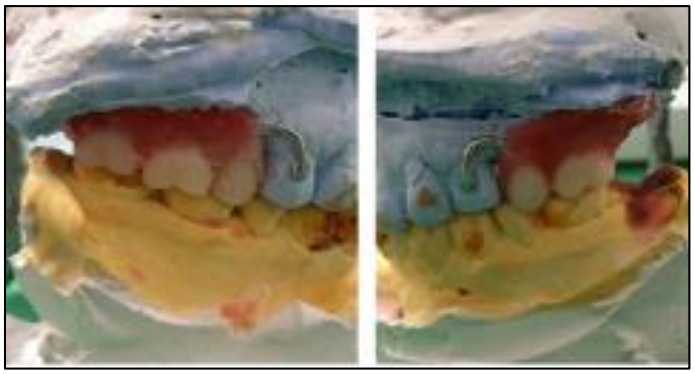

Figure 5 Acrylic tooth arrangement

Figure 6 Final polishing

One day post insertion, patient was recalled to evaluate the clinical condition and was asked whether the patient has any complaint. The patient did not experience any difficulties with the dentures. Intraoral examination was performed and no lesions and good occlusion were found when checked with articulatory paper. Instructions for eating soft foods for 3 days and a 2nd recall. The patient was recalled 3 days after insertion and one week after insertion for further evaluation and the patient had no complaints.

Figure 7 Insertion in patient, view from the occlusal (A), right side (B), left side (C).

4. Result and Discussion

In this case report, the patient experienced abrasion that was evenly distributed on the remaining labial cervical teeth. Therefore, it is necessary to provide an understanding to the patient to also treat these teeth, how to brush teeth properly, and avoid eating in the anterior area. The patient was also informed that comprehensive and complex treatment would be required for the upper jaw. A detailed explanation was provided regarding each stage of the treatment process, along with an overview of the expected outcomes. The operator also discussed this case with the lab technician, establishing a three-way communication between the patient, dentist, and lab technician. This ensured that the treatment results align with predictions and would be satisfying for both the patient and the dentist [6].

The patient also has a bad habit of eating with their front teeth and consciously grinding their front teeth. According to Khan [7], the close relationship between attrition, erosion, and abrasion creates a multifactorial process that leads to tooth wear. Although this patient experiences tooth wear, no temporomandibular disorder (TMD) is present. Okeson [8] stated that the human musculoskeletal system is capable of adaptation, allowing it to tolerate various conditions without exhibiting pathological signs or functional changes. Therefore, malocclusion, minor trauma, emotional stress, severe pain, or parafunctional habits do not necessarily result in temporomandibular disorders (TMD). The concept of adaptability is logical and can be explained, but it is often challenging to verify through research. This appears to be due to the complexity of the human body. Additionally, several factors influencing an individual's adaptive capacity are usually related to genetic, biological, hormonal, demographic, and other variables.

In this case, the preliminary treatment involves composite restorations for the anterior teeth and the fabrication of a PFM (Porcelain Fused to Metal) crown on the tooth that will be used as a clasp abutment. This is due to the significant depth and width of the abrasion, as well as to maintain the strength of the restoration against friction with the clasp. The PFM crown is milled to ensure that the position of the clasp is precisely aligned in the optimal position.

5. Conclusion

Metal frame removable partial denture as a treatment choice for partial edentulous was proven to be effective. Metal frame RPD provides satisfaction to the patient and improve aesthetic and function.

Compliance with ethical standards

Disclosure of Conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in this study.

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