

# TREATMENT OF PATIENTS WITH PARTIAL EDENTULOUSNESS

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**ABSTRACT** Introduction: Partial edentulousness has always been a challenge for dental treatment, especially if the patient needs complex dental treatment. The purpose of this article is to represent the possibilities of treatment for patients with partial edentulousness. Case series: For the purpose of this study, three patients have been examined, diagnosed and treated for their diagnosis - partial edentulousness. The patients were treated in accordance to their skeletal classes, imitating nature. The persisting natural teeth were examined, treated and prepared for the complex fixed - removable dental constructions using attachments. The stomatognathic system was carefully examined, with extraoral and intraoral measurements. Conclusion: Every patient needs to be individually treated for optimal results. Still, the combination of fixed-removable complex construction remains the golden standard for patients who have healthy (or treated) permanent teeth and, for several reasons, are not candidates for implants. The individual characteristics of each patient need to be imitated, thus mimicking nature. The combination of fixed - removable dental constructions is a good solution from a functional - aesthetic aspect for the mutual satisfaction of the patient and the prosthetic team.

**KEYWORDS** partial edentulousness, imitating nature, fixed-removable dental constructions, precision attachments

## Introduction

Patients have various problems with their dentition. Among these are the loss of their teeth. Some teeth can not be saved, and some have not erupted, have been fractured, or have been lost for many different reasons. The definition of the considerable significance of teeth demonstrates their importance. Among other things, teeth have a function to support the lips and cheeks, providing for a fuller, more aesthetically pleasing appearance. They manage to maintain an individual's vertical dimension of occlusion. Also, they allow proper pronunciation of various sounds along with the tongue and lips. Authors conduct that tooth loss has a major impact on the general and psychological

health of patients, which is why dental practitioners should perform their great role in prevention, education and treatment [1].

Patients with partial edentulousness have decreased masticatory activity, which makes it extremely difficult to chew food efficiently. This also depends on which group of teeth have been lost. If posterior teeth are lost, the patient uses their anterior teeth to chew, which is not physiological. Thus, using a greater amount of force, anterior teeth are easily abraded, fractured or lost. The occlusion needs to be restored with appliances such as removable partial dentures, bridges or implant-supported crowns.

Every patient is an individual that represents himself with certain features. Some of them are natural characteristics, that when imitated in the prosthetic plan, can create an aesthetic-functional solution, satisfactory for the patient. Skeletal classes represent the position of the teeth following the alveoli dentales. Nature itself carries beauty, and it is very important to be imitated.

Some dentist would say that implants can replace teeth that can be lost, thus providing comfortably fixed constructions. However, not every patient is a candidate for implants. Some

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have comorbidities that are contraindicated for implantation. Others have financial problems and can not afford implants and implant-supported prosthetic devices.

When treating partial edentulousness, the usage of precision attachments can be implemented. Jain and Aggarwal have defined an attachment as "a mechanical device for the fixation, retention, and stabilization of dentures". They have also described that precision attachments are two precocious metal components manufactured to form an articulated joint, designed to replace occlusal rest, bracing arm, and retaining arm of the conventional clasp retained partial denture [2,3].

The purpose of this article is to represent the possibilities for treatment for patients with partial edentulousness by using classic metal, ceramic fixed constructions and removable complex partial skeletal dentures.

### Case report

For this article, three patients with partial edentulousness were treated and rehabilitated prosthetically, with a combination of individually designed dental fixed constructions with precision attachments and a complex skeletal denture.

All three patients have written consent form for the intervention and procedures that have been carried out. The study was carried out at the Public Health Institution University Dental Clinical Centre "St. Panteleimon" in Skopje and the Private Health Institution, Primadent, Skopje, North Macedonia.

When first visiting the therapist, the patients had symptoms described subjectively as loss of aesthetics, poor function of their dentition/constructions and need for new constructions. The three patients described in this article have suffered headaches due to their altered situation, which involved loss of vertical dimension.

The patients have all been analysed extraorally, with measurements of the three parts of their faces. Their lower third of the face has been analysed extraorally, where sulcus nasolabialis and mentolabialis have been more expressed. Objectively the third dimension of the face was measured with a digital shambler and compared to the other two thirds. Since the previous constructions and natural teeth have been worn out, a need for reconstruction of the lower third of the face of the patients was needed. Intraoral detailed analysis was performed with the methods of inspection and palpation. The persisting natural teeth were examined and treated. Also, a need for parodontal treatment was necessary. Patients have made panoramic radiographic X-rays diagnosis for the condition of their temporomandibular joint (TMJ).

Because of the need for alteration of the vertical dimension, a treatment with intraoral splint was performed. The splint was individually designed and carried for three months before the beginning of the treatment. Thus the temporomandibular joint had an appropriate time for rehabilitation from the lowered vertical dimension.

After a meticulous examination of the entire stomatognathic system and the temporomandibular joint, evaluation was performed for beginning with the prosthetic rehabilitation. Studio models were analyzed for the situation of each patient. After that, the natural teeth were prepared, and impressions were taken for the fixed dental bridge constructions. After finishing the fixed construction, impressions were obtained for the complex skeletal denture.

After finishing the definitive prosthetic rehabilitation, the patients were followed for 12 months.

The first patient is a 65-year-old female who has had fixed dentures in the upper jaw and a complex fixed - removable prosthetic device in the lower jaw. However, because they were abraded with chipped porcelain, they needed replacement with new constructions (figure 1a,b,c,d). She lost her posterior teeth in her upper jaw but insisted the treatment to be finished with a fixed dental appliance.



**Figure 1** a) Intraoral view of the maxilla - upper fixed dental construction. b) Intraoral view of the mandibula - fixed dental construction with Ceka attachments. c) Intraoral view of the fixed-mobile complex dental construction. d) The occlusion of the patient

The second patient is a female patient at 47 years of age, who had a condition of bimaxillary protrusion, which was also imitated in the definitive construction. She was treated prosthetically before, but because she lost some of her posterior teeth, she needed a new construction (figure 2 a,b,c,d).



**Figure 2** a) The patient before treatment. b) Intraoral view of the new fixed constructions. c) Intraoral view of the fixed constructions with Lecodent bar in occlusion. d) The complete rehabilitation of the patient.

The third patient is a 70-year-old lady who was in need of

complex rehabilitation in the upper and the lower jaw. She lost a group of posterior teeth that needed replacement with new dental prosthetic constructions (figure 3 a,b,c,d).



**Figure 3** a) Intraoral view of the upper jaw. b) Left lateral view of the finished construction after 12 months. c) Right lateral view of the finished constructions after 12 months. d) The definite construction of the satisfied patient.

## Discussion

The overall results of the treated patients in the period of following for 3 months while readjusting their altered vertical dimension and in the next 12 months after the definitive prosthetic rehabilitation are in general satisfactory. In the measurements obtained from the three parts of their faces, on the first visit to the dentist, they had lowered vertical dimension and need for replacement of the previous therapeutical devices. The extraoral examination on the first visit to the dentist had shown pronounced sulcus nasolabialis and sulcus mentolabialis. Intraorally the patients had previous prosthetic devices, but because of the loss of a group of posterior teeth, their plan for reconstruction was altered. In the definite restorations, the vertical dimension was restored in a physiological method. This method was carried out by designing a splint individually in a dimension that would help the temporomandibular joint adjust to the new increased vertical dimension manufactured in the new prosthetic devices.

The panoramic radiographs have discovered normal findings for the condition of the TMJ in all patients. However, despite the normal observations, the patients complained of headaches. Headaches are usually an accompanying sign of temporomandibular disorders. In the three cases, the lowered third of the vertical dimension had an impact on the everyday life of the patients. They had to use greater masticatory forces to chew their food. Thus they were influencing the temporomandibular joint and causing straining of the masticatory muscles, and the effort resulted in headaches. All three patients had different individual-specific characteristics that were imitated in compromise with the therapist.

Thus the definite functional - aesthetic prosthetic rehabilitation has been achieved for the mutual satisfaction of the patients, the dental prosthetist and the dental technician.

At the controls at one week after therapy, one month, three months, six months, 12 months and 15 months, the results were

satisfactory in all patients. The patient's subjective symptomatology was confirmed objectively, in the disappearance of the headaches, improvement of the masticatory function and aesthetic rehabilitation as well. Sometimes as a therapist, we are in a situation to be in a position of finding compromises between the patient's health, their condition in the mouth and their financial situation.

Compromises can be difficult as therapists tend to remain calm, diplomatic and sometimes act as psychologists to persuade the patients, which can be obtained following the sentence: "primum non nocere" [4]. All three patient used in this research article is a specific sample that sometimes there are exceptions that we must make as therapists. Sometimes we need to use some old proven methods because of many factors that would be accepted.

The first patient is a 65-year-old lady with many chronic diseases such as heart operations and osteoporosis. Authors have made various investigations on how implants can be provided for patients with osteopenia and osteoporosis [6].

On her panoramix a lowered sinus was discovered where she had extracted her upper posterior teeth in her right posterior region. She also has a fixed dental construction before in her upper jaw and refused to have a combination of the fixed-mobile prosthetic device, which would have replaced her extracted teeth. However, the compromise needed to be made with a shortened dental arch on the insisting of the patient, for what she signed consent. She had a wide diastema which was imitated in her new construction. Also, she had a skeletal class II, which was imitated in the prosthetic treatment. For the prosthetic rehabilitation in her upper jaw, metal ceramics was used.

In her lower jaw, a combination of fixed-removable dental appliances was manufactured.

Ceka attachments remain a golden standard for treatment. In this case, the matrix is attached to the fixed dental bridge, and the patrix is attached to the removable skeletal complex denture designed in the lower jaw. It is described by authors that the economy, simplicity of care, ease of insertion and removal, and comfort in function make this type of dentures acceptable to patients [6]. The ease of fabrication, esthetics, and strength make the Ceka attachment a necessary adjunct to the armamentarium of modern prosthetic dentistry [6].

The second patient was a relatively young patient who has lost her teeth in neglect by avoiding visiting the dentist's office. She has a condition orthodontically described as bimaxillary protrusion. She has had several teeth under crowns and a classic removable denture which was the reason for losing some of the teeth in the posterior region. She was also with an altered vertical dimension. Her new construction consisted of the circular fixed dental metal-ceramic bridge in the upper jaw. In her lower jaw after her extractions, a fixed dental bridge was manufactured with Lecodent bars. The patrix is on the fixed dental bridge and the matrix in the removable skeletal denture. Lecodent bars are still widely used as therapeutic devices for the replacement of teeth [7].

The third patient had teeth extracted in the posterior region in her upper and lower right part of her maxilla and mandibulae. She was also treated with metal-ceramic dental bridges with Lecodent bars and a skeletal denture with the inserted matrix.

On the control, after 12 months, resorption of the bone can be seen (figure 3 c,d), which was easily solved. Overall using the material and methods described above and after the results obtained after 15 months of prosthetic rehabilitation, satisfactory

completion of the therapy can be described. What is even more important is the satisfaction of the patients.

## Conclusion

Partial edentulousness represents still a great challenge for treatment for the dental prosthetist and the dental technician. It can be solved in more than one way. However, sometimes the conditions are such that compromises need to be made. There are cases where for many reasons, metal ceramics and classic elements are used for prosthetic rehabilitation. Not every condition can be solved with implants, nor can every patient afford contemporary dental solutions. Precision attachments remain a golden standard, with their matrix and patrix component for restoration of the loss of the dental arches. In the end, what is more important is the functionally - aesthetic rehabilitation of the patients imitating their natural specific characteristics, restoring what has been lost in the mutual satisfaction of the patients and the dental prosthetic team.

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## Conflict of interest

There are no conflicts of interest to declare by any of the authors of this study.

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