

# Prosthodontic Rehabilitation of Patient with Anterior Hyper Function Syndrome

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## Abstract

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**BACKGROUND:** The success of prosthetic rehabilitation in patients with removable dentures depends on the achievement of the aesthetics, phonetics and most of all, proper use in the mastication process. All the patients that receive removable prostheses need a feeding education program. They must cut the food into smaller pieces, extend the length of time necessary for chewing and place the food upon both the right and left sides of the mouth at once. Bilaterally chewing with dentures will contribute to increased efficiency and denture stability during mastication. Using the anterior teeth for biting, as a result of increased pressure on the anterior ridge may lead to the anterior hyperfunction syndrome.

**CASE REPORT:** The patient requested dental rehabilitation in our clinic for prosthetic dentistry two and a half years ago. We examined him and made therapy plan, for complete removable maxillary denture and partial mandibular denture. Besides our instructions for proper use of dentures and necessity for regular controls, his next visit was after two and a half years. He came with enlarged tuberosity and papillary hyperplasia in the pre-maxillary region. After oral surgery treatment (laser removing of hyperplastic tissue) and a healing period of four weeks, we made indirect relining on the upper denture, re-occlusion and re-articulation achieving weak contacts between the lower natural teeth and upper teeth of the complete denture. The patient was advised not to bite food with his anterior teeth, and avoid chewing very hard food which tends to imprint and displace dentures.

**CONCLUSION:** Anterior hyperfunction syndrome with its high incidence is a disease with the need of interdisciplinary therapy approach. Fast diagnosis, thorough clinical examination using all available diagnostic tools, and choosing the right treatment is very challenging.

## Introduction

The anterior hyperfunction syndrome is associated with the combination syndrome or Kelly Sy. In 1972, Kelly presented clinical case, with the combination of edentulous maxilla opposed by natural mandibular anterior teeth, and called it the combinationsyndrome, today in his honor - Kelly's syndrome [1]. This syndrome was presented as combination of some specific destructive changes, in the hard and soft tissues, morphological and functional, and characterised by Kelly through five clinical symptoms [2] (Figure 1).



Figure 1: Kelly syndrome

The Glossary of Prosthodontic Terms defines Combination Syndrome as: The characteristic features that occur when an edentulous maxilla is opposed by natural mandibular anterior teeth, including loss of bone from the anterior portion of the maxillary ridge, overgrowth of the tuberosity, papillary hyperplasia of the hard palatal mucosa, extrusion of mandibular anterior teeth and loss of alveolar bone and ridge height beneath the mandibular removable partial denture bases, also called anterior hyperfunction syndrome [3, 4]. In 1979 Saunders, Gillis and Desjardins suggested extending the range of symptoms that characterize this syndrome by adding the following features: loss of the correct vertical dimension of occlusion, papillary hyperplasia on the hard palate, incorrect occlusal plane, patient's poor adaptation to dentures, occurrence of granuloma fissuratum and changes in the periodontium of existing natural teeth [5, 6].

The success of the prosthetic rehabilitation in patients with removable dentures depends on the achievement of the aesthetics and phonetic ability, and most of all, from the proper use of the devices in the masticatory process [7]. All the patients that receive removable prostheses need a feeding education program. They must cut the food into smaller pieces, extend the length of time necessary for chewing, and place the food upon both the right and left sides of the mouth at once [8]. The masticatory function is important for the proper preparation of food bolus in the mouth, and since dentures provide only 15-50% masticatory efficiencies, bilateral mastication is very important, for feeding and denture stability also [9]. During the adapting period with keratinisation of the residual alveolar ridge, after learning to have active control overdentures, patient's diet can change to harder food. In general, the food has to be cut in small bites and bitten with the side teeth, not the front one. The masticatory time is prolonged, and bilateral chewing is the best option. Bilateral chewing is very hard to achieve because in normal dentition there is unilateral chewing habit [10, 11]. Using the front teeth for biting hard food can cause higher pressure on the anterior residual ridge and appearance of anterior hyperfunction syndrome [12, 13].

The combination syndrome has a prevalence of 25% of individuals, wearing both complete denture opposing mandibular anterior teeth and a bilateral distal extension removable partial denture [14]. This syndrome is found in 48.8% of patients with a complete upper denture who do not wear a lower partial denture [15].

## Case report

A 52-year-old male patient was received in the Clinic for Prosthodontic, two and a half year ago, for restorative treatment. On clinical examination, the

patient had an edentulous maxilla and four natural mandibular anterior teeth. Initial therapy procedure included oral hygiene instructions, caries control and manufacturing two dentures, complete maxillary and partial mandibular denture.



Figure 2: Super eruption of the frontal teeth and mandibular ridge resorption

Beside our advice for proper use, maintains, and regular check-ups, his first visit was after two and a half years. The patient's chief complaints were inadequate retention of maxillary complete denture and light swallowing in the upper canine region, without pain. During the intraoral examination, there was denture hyperplasia in the intercanine region of the upper jaw (Figure 2), flabby tissue.



Figure 3: Denture-hyperplasia of maxilla

One of the most common tissue reactions to a chronically ill-fitting denture is this inflammatory hyperplasia. Although benign, the condition is relatively troublesome since it interferes with denture placement. Surgical excision is the treatment of choice. With conventional techniques, high levels of skill with the accurate planning of incisions and repositioning of tissues are mandatory to prevent loss of sulcus depth. A reliable alternative to conventional surgery is the use of lasers. In this case was the application of neodymium (Nd: YAG) laser by Fotona. The Nd: YAG laser has long been used for oral surgery as it was the first purpose-built laser for dentistry. The patient agreed with suggested oral surgery treatment (vestibuloplasty and excision of the flabby tissue) with soft-tissue laser by Fotona.



Figure 4: Fotona SP Dynamis

The oral surgical procedure was performed with a previous application of a 3% anaesthetic - Scandonest, in the form of local infiltration anaesthesia with the help of a carpule syringe for the maxillary nerve. The wound can be left for secondary healing without sutures or covering.



Figure 5: Use the Nd: YAG laser

Care should be taken with all soft tissue lasers to direct the laser parallel to the underlying bone or other anatomical structures like foremen or salivary glands. After the treatment, he was advised to maintain good oral hygiene and to apply Solcoseryl dental adhesive three times a day, on the operation site.

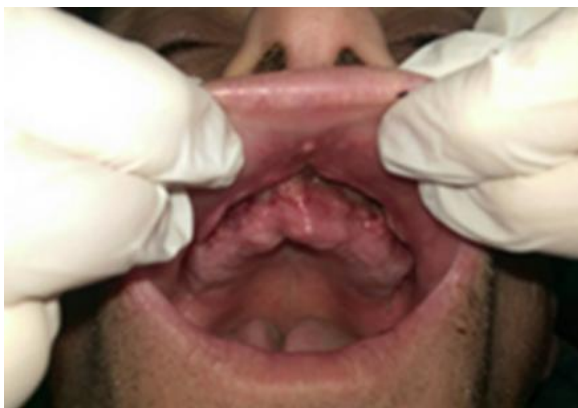


Figure 6: Condition after use of laser

After two weeks we made control check-up, and found hyperplastic tissue still present, in some parts of the upper jaw. We decided that a revision of the surgical treatment was necessary for complete healing by (Figure 7).



Figure 7: Revision of the surgical treatment by Nd: YAG

It took over four weeks for tissue consolidation and healing of the treatment wounds, and after that our prosthodontic treatment was indirect relining of the upper complete maxillary denture (Figure 8) to achieve retention and stability.



Figure 8: Postoperative situation without flabby tissue

Next part of the therapeutic procedure was achieving and maintaining good occlusal bilateral balance with proper re-occlusion and re-articulating of the dentures (Figure 9).



Figure 9: Panoramic radiograph of the patient

Panoramic radiograph showed a typical case of combination syndrome with resorption of the anterior maxillary bone, periodontal changes with super-eruption of opposed mandibular anterior teeth and severe resorption of the residual mandibular alveolar ridge (Figure 10).



Figure 10: New situation with relined existing dentures

The patient was given instructions about food diet habits; he was warned not to bite hard food with front teeth because very hard food can imprint his dentures in the soft tissue and interfere with their stability. Regular chek-ups were appointed in two weeks, once a month, and every three months during the first year. The dentures were with satisfactory retention and stabilisation, and soft tissue without hypertrophic changes.

## Discussion

The constant occlusal pressure of natural teeth on the opposing alveolar ridge can cause a bone atrophy of the edentulous region. A reverse effect of hypertrophy of the alveolar bone with an extrusion of teeth opposed by an edentulous jaw segment is also evident and usually develops synchronously. There are several classifications of the most dominant changes within this syndrome in three classes and subclasses [16].

Occlusal forces can cause remodelling of the jaw bonelike atrophy or hypertrophy and intensity of the changes vary from mild, moderate, to severe. Different factors, including presence or absence of teeth, history of tooth loss, the periodontal condition of present teeth, previous prosthetic treatments, bone density some parafunctional and dietary habits, influence the changes [17].

When treating the patients with anterior hyperfunction syndrome, we must make attempts to minimise the destructive changes by distributing occlusal stress over the hard and soft tissues and developing balanced and stable occlusion [18]. The maximal supporting surface under the dentures base, mandibular posterior support and balanced bilateral occlusion are proposed for longevity without typical clinical problems.

Treatments are different, and they have to be directed towards removing of the hypertrophic tissue with conventional or laser surgery (vestibuloplasts and excision of flabby tissue followed by metallic denture base prosthesis).

Planned extractions followed by immediate dentures is treatment when arch requires alveolectomy along with the extraction of the anterior teeth for patients with the severe prognathic maxilla, periodontally compromised proclined anterior teeth present in the maxillary arch and missing mandibular posterior teeth [19]. In patients, without surgical treatment, we have to use some modified impression techniques over the flabby area, during prosthodontic treatment. Best materials for this are zinc oxide eugenol impression paste, green stick and elastomeric [20].

Implant supported overdentures, and the fixed metal-ceramic prosthesis is also a satisfactory, good treatment option, but they are far more expensive [21]. Another new therapy treatment is to substitute resorption of the bone with bone augmentation, grafting procedure (autogenous iliac crest, autogenous rib grafts, calvarial bone grafting, tibiae grafting), or use of the Osseo-inductive effect of bone morphogenic protein within endosseous dental implants, etc. [22-24].

When we have to choose the type of prosthodontic treatment the most important factor is the distance from the residual ridge to the occlusal plane. This distance is increased by the vertical loss of bone and of soft tissue that occurs in this patient. When this distance is higher than 15 mm, the most indicated prosthesis is a removable type (overdenture), because resorpted tissue is compensated with the acrylic material [25]. The use of fixed restorations of metal porcelain type is compromised because it can result in the production of elongated teeth, which are not very aesthetic and also lead to increased leverage forces [26].

In conclusion, anterior hyperfunction syndrome with its high incidence is a disease with the need of interdisciplinary therapy approach. Fast diagnosis, thorough clinical examination using all available diagnostic tools, and choosing the right treatment is very challenging. Oral surgery as part of the therapeutic protocol, proceed with proper prosthodontic treatment brought our long-term patient solution for all of his problems. Our procedures were also successfully directed towards the preservation of the health of the natural dentition and their masticatory function.

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