REVIEW ARTICLE

COMBINATION SYNDROME: A REVIEW

Authors:

Seema George[1]
Shilpa Joseph[2]
Binsu S[1]
Cinil Mathew[2]

[1] Reader
Dept. of Prosthodontics
Indira Gandhi Institute of Dental Sciences
Kothamangalam, Ernakulam Dt., Kerala

[2] Sr. Lecturer
Dept. of Prosthodontics
Indira Gandhi Institute of Dental Sciences
Kothamangalam, Ernakulam Dt., Kerala

Address for correspondence

Dr. Seema George
Reader
Dept. of Prosthodontics
Indira Gandhi Institute of Dental Sciences
Kothamangalam, Ernakulam Dt., Kerala
Email: dr_seemag@yahoo.com

ABSTRACT

Oral destructive changes that occur in a sequential manner are often seen in patients with a maxillary denture opposing a mandibular removable partial denture. This was identified and coined by Ellsworth Kelly in 1972 as 'Combination syndrome'. This article presents the clinical features associated with it and the treatment options available for such a patient.

Key words : Syndrome, distal extension, epulis fissuratum.

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INTRODUCTION

Combination syndrome was identified by Kelly in 1972 in patients wearing a maxillary complete denture opposing a mandibular distal extension prosthesis. The glossary of Prosthodontic terms defines combination syndrome as 'the characteristic features that occur when an edentulous maxilla is opposed by natural mandibular teeth including loss of bone from the anterior portion of the maxillary ridge, overgrowth of tuberosities, papilary hyperplasia of the hard palate's mucosa, extrusion of lower anterior teeth and loss of alveolar bone and ridge height beneath the mandibular removable dental prosthesis bases. It is also called anterior hyperfunction syndrome'[2]. This complication is not seen in cases of complete dentures opposing natural mandibular posterior teeth.

History

Ellsworth Kelly in 1972 was the first person to use the term 'Combination Syndrome'. He studied a small group of patients wearing a complete maxillary denture opposed by remaining mandibular anterior teeth and a distal extension removable partial denture (RPD). Of the 6 patients followed up for 3 years, all showed a reduction of the anterior bone in the maxilla along with enlarged tuberosities[3]. For 5 patients there was an increased bone level of the tuberosities. He described 5 signs or symptoms that commonly occurred in this situation. They include anterior maxillary ridge resorption, papillary hyperplasia in the hard palate, maxillary tuberosity hypertrophy, extrusion of the mandibular anterior teeth, and bone loss under the partial denture base. His theory stated that this sequence was triggered due to a negative pressure within the maxillary denture, which causes the anterior ridge to be driven upward by the anterior occlusion, followed by an early loss of bone from the anterior part of the maxilla and formation of epulis fissuratum in the maxillary sulcus. This is followed by maxillary tuberosity hypertrophy, supra eruption of the remaining natural lower anterior teeth and posterior mandibular resorption.[4]

Saunders et al in 1979 added to the description of the combination syndrome by including destructive changes such as loss of occlusal vertical dimension, occlusal plane discrepancy, anterior spatial repositioning of the mandible, poor adaptation of the prostheses, epulis fissuratum and periodontal changes. Saunders et al suggested that the sequence of events is initiated by the loss of mandibular posterior support, resulting in a gradual decrease of occlusal load posteriorly; an increased occlusal load anteriorly and eventually increased pressure resulting in resorption of the maxillary anterior residual ridge.[4]

Pathogenesis

Combination syndrome progresses in a sequential manner. The group of complications which represent as a syndrome are interlinked to one another. The progress of the disease can occur in any one of the following sequences.

Sequence 1

The patient will tend to concentrate the occlusal load on the remaining natural teeth (mandibular anteriors) for proprioception. Hence, there is more force acting on the anterior portion of the maxillary denture.

This leads to increased resorption of the anterior part of the maxilla which gets replaced by flabby tissue. The occlusal plane gets tilted anteriorly upwards and posteriorly downwards due to lack of anterior support. The labial flange will displace and irritate the labial vestibule leading to the formation of epulis fissuratum. Posteriorly there will be fibrous overgrowth of tissues in the maxillary tuberosity.

The shift of the occlusal plane posteriorly downwards produces resorption in the mandibular distal extension denture bearing area due to the tilt of the occlusal plane, the mandible shifts anteriorly during occlusion. The vertical dimension at occlusion is decreased. The retention and stability of the denture is also decreased. The tilt in the occlusal plane disoccludes the lower anteriors causing them to supraerupt. This reduces the periodontal support of the anterior teeth. The supraerupted anteriors increase the amount of force acting on the anterior part of the complete denture and the vicious cycle continues.[1]

Sequence 2 (Craddock)

1. There is a gradual resorption of the distal residual ridge .
2. This leads to tilting of the occlusal plane posteriorly downwards and anteriorly upwards .
3. Rest of the vicious cycle continues as in sequence 1 .

Combination syndrome should be identified at an early stage and prevented. Planning over dentures and designing implant-supported dentures are some methods to prevent combination syndrome.[1]

Prevalance

Shen & Gongloff in 1989, reviewed records of 150 maxillary edentulous patients who had maxillary complete dentures and mandibular anterior natural teeth. One in four demonstrated changes consistent with the diagnosis of Combination syndrome.[1]

TREATMENT OPTIONS IN COMBINATION SYNDROME

Saunders et al in 1979 stated that, the basic treatment objectives in treating these patients is to develop an occlusal scheme that discourages excessive occlusal pressure in maxillary anterior regions in both centric and eccentric positions[1].

Mandibular R.P.D should provide positive occlusal support from the remaining anterior teeth and have maximum coverage of basal seat beneath distal extension bases.

The design should be rigid and should provide maximum stability while minimizing excessive stress on remaining teeth. The occlusal scheme should be at a proper vertical and centric relation position. Anterior teeth should be used for cosmetic and phonetic purpose only. Posterior teeth should be in balanced occlusion.[1]

Treatment options in the maxillary arch[5]:

Treatment Option 1: Planned Extractions Followed by Immediate Denture:

This technique enables the decrease in the resorption rate of the maxillary anterior residual ridge because ridges are subjected to early function coupled with improved aesthetics of the patient. It prevents formation of flabby tissues which could also arise as a result of unplanned or uncontrolled dental extractions.

Treatment Option 2: Overdenture Prosthesis with a Metallic Denture Base:

Maxillary overdenture placed on retained anterior maxillary roots will absorb occlusal forces exerted by anterior mandibular teeth thereby reducing the resorption of the maxillary ridge. Reinforcing the denture base with a cast metal framework has been shown to reduce fracture rates.

Treatment Option 3: Special impression techniques for flabby tissues:

Mucostatic impression techniques are used here. The material used for impression are impression plaster, zinc oxide eugenol, greenstick compound and Elastomeric material.

Table 1:Clinical presentation of the syndromic characteristics[6]

Syndrome Characteristics	Clinical Evaluation
Bone resorption in the maxillary anterior region	Observation of flaccid tissue in the anterior region of the residual ridge susceptible to displacement
Tuberosity overgrowth	Vertical and/or horizontal growth of fibrous or bone tissue in the right and/or left tuberosity region
Palatal papillary hyperplasia	Observation of erythematous mucosa with a papillary surface in the hard palate
Extrusion of the remaining natural mandibular teeth	Observation of dental wear at the enamel or dentin level
Mandibular posterior bone resorption	Observation of accentuated bone resorption in the posterior edentulous region

Treatment Option 4: Surgical Intervention

Vestibuloplasty and excision of flabby tissue followed by metallic denture base prosthesis.

Treatment Option 5: Implants

Implant treatment options like implant supported fixed ceramo-metal prosthesis, Implant supported over denture can be placed.

Treatment planning for the Distal extension partially edentulous Mandibular Arch

Treatment Option 1: Overdenture

Mandibular overdenture produced better prognosis in patients who already had combination syndrome and whose mandibular teeth were structurally or periodontally compromised.

Treatment Option 2:

A removable cast partial denture.

Treatment option 3: Mandibular implant supported overdenture

It offers significant improvement in retention, stability, function and comfort for the patient and a more stable and durable occlusion.

Treatment Option 4: Implant Supported Fixed Prosthesis.

In 2001 Wennerberg et al reported excellent long term results with mandibular implant supported fixed prosthesis, opposing maxillary complete dentures.

All these treatment forms were directed towards the preservation of health of natural dentition and its masticatory function.

CONCLUSIONS

Patients with a maxillary complete denture and a distal extension removable partial denture are subjected to irreversible degenerative changes. Combination syndrome has a prevalence rate of approximately 24% for denture patients[7].It is important to make the patient aware of the changes and advocate the best possible treatment option that provides the preservation of the remaining natural tissues.

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