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Review Article

# THE COMBINATION SYNDROME: A CHALLENGE FOR PROSTHODONTICS - A REVIEW

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### ABSTRACT

Combination syndrome (CS) is a dental condition that is commonly seen in patients with a completely edentulous maxilla and partially edentulous mandible with preserved anterior teeth. This syndrome consists of severe anterior maxillary resorption combined with hypertrophic and atrophic changes in different quadrants of maxilla and mandible. This makes it a challenging condition in dentistry that requires significant experience along with advanced restorative and surgical skills. The aim of this article to review the literature regarding combination syndrome to evaluate the evidence for this concept.

**Keywords:** Resorbed maxilla, Hypertrophic bone, Combination syndrome, Facial Deformity, Edentulous mandible

### INTRODUCTION

Completely edentulous maxilla and mandible with only anterior teeth remaining are a common clinical situations causing progressive loss of bone in the posterior aspect of the mandible. If the bilateral distal extension mandible and completely edentulous maxilla are rehabilitated with removable partial dentures, there are chances that mandibular denture base sink gradually because of resorption of alveolar bone in the posterior aspect of mandible leading to posterior open bite. The lack of posterior occlusal contacts causes an eventual and progressive shift of masticatory function to anterior segments<sup>1</sup>. This syndrome associated with resorption of the residual alveolar ridge is termed as combination 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 tuberosities, 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<sup>2</sup>. Ellsworth Kelly was the first person to use the term “combination syndrome.” He followed a small group of patients wearing a complete maxillary denture opposed by mandibular anterior teeth and a distal extension distal removable partial denture (RPD). He discussed “excessive

bony resorption under the mandibular removable partial denture bases” but provided no values<sup>3</sup>.

Kelly discussed various possibilities to avoid combination syndrome, including extraction of the mandibular teeth, but did not advocate this solution. Instead, he proposed using the roots of anterior mandibular teeth to support an over denture<sup>3</sup>.

A few years later, further characteristics were added to the combination syndrome: loss of vertical dimension of occlusion, occlusal plane discrepancy, anterior spatial repositioning of the mandible, poor adaptation of the prostheses, epulis fissuratum, and periodontal changes<sup>4</sup>. Combination syndrome occurs among 25% of individuals who wear both complete denture opposing mandibular anterior teeth and a bilateral distal extension removable partial denture<sup>1</sup>.

#### Sequelae of Combination Syndrome

Early loss of bone from the posterior part of the mandible leads to increase in function in the anterior region as a result of posterior hypofunction. Hypertrophy of the anterior mandible with anterior hyperfunction develops. Forces originating from the lower anterior teeth are directed toward the anterior portion of the unsupported maxillary denture leading to loss of bone and ridge height anteriorly, the posterior residual ridge becomes larger with the development of enlarged tuberosity<sup>4</sup>. With the lack of posterior palatal seal, a negative pressure develops leading to papillary hyperplasia<sup>3</sup>. Along with negative pressure, chronic occlusal trauma from incisal edges of mandibular anterior teeth causes flabby tissues in the anterior palate termed as papillary hyperplasia.

Contradictory findings have been reported by Kelly and Uctasli et al while the former has demonstrated resorption in the edentulous maxilla with no resorption in the distal edentulous area of the mandible, its vice versa is true in case of the latter, especially in distal extensions retained by anterior bar<sup>3,5</sup>.

Another paramount aspect of the combination syndrome as a repercussion of ridge resorption is impairment in established posterior occlusal contact leading to the progressive collapse of vertical dimension of occlusion causing the mandible to move forward resulting in pseudomandibular prognathism<sup>1</sup>. The Bone resorption beneath the mandibular distal extension, wearing of artificial teeth, positional changes in anterior teeth instigate parafunctional activities, thereby augmenting the force per unit area on the maxillary alveolar bone<sup>6,7</sup>.

## DISCUSSION

Dorland's Illustrated Medical Dictionary defines "syndrome" as "a set of symptoms which occur together; the sum of signs of any morbid state; a symptom complex." "Combination syndrome" is not included among hundreds of syndromes listed in the dictionary<sup>8</sup>.

In a review of the literature, the authors have found no epidemiologic study of "combination syndrome." Compared with the main feature, "loss of bone from the anterior portion of the edentulous maxilla," findings such as "papillary hyperplasia of the hard palatal mucosa" seem to be rare<sup>9, 10</sup>. Enlarged tuberosities may also have other causes than those described by Kelly<sup>2</sup> as part of the combination syndrome. Enlarged tuberosities are often seen together with supraerupted maxillary molars. In situations where mandibular molars have been lost, the opposing maxillary molars may supraerupt together with the alveolar process<sup>11</sup>. The supraeruption may create enlarged tuberosities without influence of a denture.

Loss of alveolar bone and residual ridge height beneath the mandibular removable partial denture bases was included in the combination syndrome by Kelly<sup>2</sup>. Reviewed articles have shown greater bone loss in the mandible associated with an RPD compared with when no RPD or fixed prostheses supported by anterior implants was provided<sup>12,13</sup>. Compared with cantilevered fixed partial dentures, conventional Class I mandibular RPDs have been shown to cause more carious lesions, more plaque and gingivitis, as well as more signs and symptoms of temporomandibular disorders<sup>14,15</sup>.

The poor biologic outcome with Class I mandibular RPDs constitutes a strong indirect support for the "shortened dental arch" concept indicating that missing posterior teeth should not necessarily be replaced<sup>16,17</sup>. It has been convincingly demonstrated that dentitions consisting of only anterior and premolar teeth can meet oral functional demands in most situations<sup>18</sup>.

### Management of Combination Syndrome

Preventing the degenerative changes that complete maxillary denture opposing Kennedy's Class I partial dentures can be best accomplished by avoiding extraction of lower anterior teeth and retaining weak posterior teeth as abutments by means of endodontic and periodontic technique<sup>3</sup>. Also over denture can be considered as a treatment option of retaining

the roots of anterior mandibular teeth to support an overdenture.

According to Langer et al both well designed removable partial dentures and over denture can be suggested for patients with an edentulous maxilla and some remaining anterior mandibular teeth<sup>19</sup>. Well-designed mandibular removable partial denture is suggested for low-risk patients who have not developed combination syndrome and whose mandibular anterior teeth are well preserved and have not supraerupted. The destructive changes on the soft tissues brought about by Class I mandibular removable partial dentures constitutes a strong support for "shortened dental arch" concept<sup>20</sup>. Dentures with only anterior and premolar teeth can meet oral functional demands in most situations<sup>21</sup>. Surgical options can be considered in treating undesirable conditions associated with combination syndrome<sup>22, 23</sup>. The flabby hyperplastic tissue can be surgically removed, the papillary hyperplasia can be eliminated and enlarged tuberosities can be reduced<sup>C</sup> which allows the distal end of occlusal plane to be raised to proper level and allows the lower partial denture bases to be fully extended over the retromolar pad<sup>3</sup>. Correction of premaxillary bone atrophy with bone grafting can be successful in treating combination syndrome.

## SUMMARY

Clinicians have recognized a number of characteristic features of combination syndrome, but documented observations are rare. Epidemiologic studies related to combination syndrome are yet to be conducted to reach more conclusive results in diagnosing combination syndrome. On the basis of this review of the literature it may therefore be concluded that the "combination syndrome" does not meet the criteria to be accepted as a medical syndrome. The single features associated with the "combination syndrome" exist but to what extent or in which combinations has not been clarified.

## CONCLUSION

Almost inevitable degenerative changes develop in the edentulous regions of wearers of complete upper and partial lower dentures. The dentist should approach the treatment of these patients cautiously and the institution of correct treatment initiatives essential. Every patient must be made aware from the outset that the longest possible life of any prosthesis with the least possible harm to the remaining tissues, can only be ensured by regular recall and maintenance care.

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