

REVIEW ARTICLE

COMBINATION SYNDROME- A REVIEW

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ABSTRACT:

Completely edentulous maxilla and a mandible with only anterior teeth remaining is a common clinical situation seen that causes 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 the mandibular denture base sinks gradually because of resorption of alveolar bone in the posterior aspect of mandible leading to a posterior open bite. 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. The combination syndrome is best managed by prevention. However, if it does occur there are various treatment options that can be considered

Key words: Edentulous, Hypofunction, Syndrome

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INTRODUCTION

Completely edentulous maxilla and a mandible with only anterior teeth remaining is a common clinical situation seen that causes 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 the mandibular denture base sinks gradually because of resorption of alveolar bone in the posterior aspect of mandible leading to a posterior open bite. The lack of posterior occlusal contacts causes an eventual and progressive shift of masticatory function to anterior segments thus leading to excessive forces in the anterior segments especially in the maxilla.^{1,2} This syndrome associated with resorption of the residual alveolar ridge is termed as combination syndrome.²

The Glossary of Prosthodontic Terms has defined 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 posterior mandibular removable partial denture bases,” also called anterior hyperfunction syndrome.³

Kelly (1972) proposed the term combination syndrome for this oral condition and its resultant clinical features. He observed 20 patients equipped with complete maxillary dentures opposing distal-extension removable partial dentures (RPD). After three years of follow-up, six of these patients showed a reduction of the anterior bony ridge

height on lateral cephalometric radiography. Meanwhile, an increasing bone level of the tuberosities was noted in five patients.⁴

Features

There may be seven characteristics associated with this syndrome:⁵

- Bone loss in the premaxilla
- Dropping of the posterior maxilla (tuberosities)
- Extrusion of the lower anterior teeth
- Posterior bone loss in the mandible under the RPD
- Papillary hyperplasia of the maxilla
- Decreased occlusal vertical dimension
- Altered facial esthetics

Mechanics Which Produce the Combination Syndrome

Negative pressure within the maxillary denture pulls the tuberosities down by which the anterior ridge is driven upward by the anterior occlusion thereby functional load will then direct stress to the mandibular distal extension partial denture resulting in bony resorption of the posterior mandibular ridge, supraeruption of mandibular anteriors, occlusal plane discrepancy, loss of vertical dimension of occlusion and chronic stress resulting in an ill-fitting prosthesis.⁶

Prevalence among denture patients

According to Shen and Gongloff¹(1989) 150 patients who had complete maxillary dentures and mandibular anterior natural teeth, one in four demonstrated changes consistent with the diagnosis of combination syndrome.

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.³

However, enlarged tuberosities are also seen in situations where mandibular molars have been lost, the opposing maxillary molars may supra erupt together with the alveolar process.⁶ Enlarged tuberosities along with an increase in bone height causes the occlusal plane to migrate up in the maxillary anterior region and down in the maxillary posterior region, eventually the natural anterior mandibular teeth migrate upward with simultaneous mandibular alveolar hypertrophy. Anterior teeth on the complete denture disappear under patient's lip affecting the aesthetic, showing none of the maxillary anterior teeth and too much of the lower natural anterior teeth.⁴

With the lack of posterior palatal seal, a negative pressure develops leading to papillary hyperplasia.⁴ 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 Kelly⁴ and Uçtasli et al.,⁸ 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.

Another paramount aspect of the combination syndrome as a repercussion of ridge resorption is impairment in established posterior occlusal contact¹ leading to the progressive collapse of vertical dimension of occlusion causing the mandible to move forward resulting in pseudo-mandibular prognathism. 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.^{9,10}

Management

The combination syndrome is best managed by prevention. However, if it does occur there are various treatment options that can be considered

Prevention

Kelly suggested avoidance of this clinical scenario in the first instance, in what is perhaps the first instance of preventive prosthodontics being advocated.¹¹

Prevention of this syndrome can be accomplished by

- Avoiding combination of complete maxillary dentures opposing class I mandibular RPD.

- Retaining weak posterior teeth as abutments by means of endodontic and periodontic techniques.
- Use of overdenture on the mandibular teeth.
- Most importantly patient recall and maintenance.

Treatment Options

1. Fabrication of RPD which minimizes destructive forces. In 1985, Stephen M. Schmitt¹¹ described a treatment approach that attempted to minimize the destructive changes, by using the treatment objectives of Saunders *et al*. The prosthesis is made in 2 stages. The mandibular RPD is completed first after which acrylic resin teeth are used to replace the maxillary anterior teeth and cast gold occlusal surfaces are provided for posterior denture teeth.
2. A mandibular overdenture provided better prognosis in patients who already had combination syndrome and whose mandibular anterior teeth were structurally or periodontally compromised. Mandibular implant-supported overdenture offers significant improvement in retention, stability, function and comfort for the patient and a more stable and durable occlusion.¹³
3. Use of Implant supported fixed prosthesis. In 2001, Wennerberg *et al* reported excellent long-term results with mandibular implant supported fixed prostheses, opposing maxillary complete dentures.¹⁴
4. Some form of stabilization of the maxillary arch which can be accomplished by retention of maxillary overdenture abutments, use of maxillary osseointegrated implants or by augmentation of maxilla with resorbable hydroxyapatite in conjunction with a guided tissue regeneration technique and vestibuloplasty.¹³
5. Use of linear occlusion as an alternative option to prevent contact of anterior teeth which involves non interceptive linear occlusion combined with the bilateral fulcrum of protrusive stability. Linear occlusion consists of masticatory surfaces in the form of a straight, long occlusal ridge in contact with flat monoplane opposing surfaces, there are no cusp inclines with which to make contact during the envelope of function.²

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 management strategies should be tailored to suit the needs of an individual patient. Every patient should be properly educated about the harmful effects of the syndrome and it must be ingrained in him that the longest possible life of any prostheses with the least possible harm to the remaining tissues, can only be ensured by regular recall and maintenance care. "Prevention is the best cure" is the philosophy that should be followed.

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