

Management of Combination Syndrome: A Case Report

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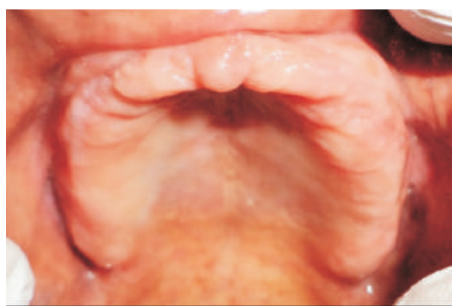
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Abstract: The practice of prosthetic dentistry can be affected by the 'Combination Syndrome' and its associated difficulties. They may present considerable clinical and technical difficulties to the dental practitioner even if this condition was first recognized over 30 years ago. This clinical scenario classically relates to changes found in the mouth after prolonged use of a maxillary complete denture that has opposed natural mandibular anterior teeth mainly. The purpose of this article is to describe treatment of a patient who has shown clinical features of this condition, and review some of the relevant literature on this condition. For a variety of sound dental, medical and financial reasons, conventional prosthodontics still has much to offer in the oral rehabilitation of patients presenting with Combination Syndrome.

Introduction

The prosthodontic rehabilitation of an edentulous arch which opposes natural or restored teeth may present a considerable clinical challenge to the dental practitioner. Potential clinical problems encountered may include

1. Difficulty of varying support areas mostly anterior maxillary 'flabby ridge' which is thought to be caused by differential forces on an edentulous ridge caused by a partially dentate opposing arch; (fig. 1)
2. Enlarged maxillary tuberosities which limit the correct orientation of the occlusal plane and the amount of inter-ridge space available for positioning prosthetic teeth.^{1,2}



(fig. 1) Flabby Maxillary Anterior Ridge, Overgrowth of The Maxillary Tuberosities With Papillary Hyperplasia
(fig. 2) Lateral Cephalograph

These type of features were first described by Ellsworth Kelly in 1972, who described the 'changes caused by a mandibular removable partial denture opposing a maxillary complete denture'.³ Naming this condition the 'combination syndrome', he described the common clinical features, namely

- Resorption of the maxillary labial plate (leading to a flabby maxillary anterior ridge) (fig. 1)
- Overgrowth of the maxillary tuberosities; (fig. 1)
- Papillary hyperplasia
- Extrusion of the lower anterior teeth; (fig. 3)
- Resorption of mandibular bone under the partial denture bases (if worn).



(Fig. 3) Extrusion of The Lower Anterior Teeth

Kelly proposed that this scenario was caused by what is commonly termed insufficient 'posterior occlusal support', which lead to increased occlusal forces on the anterior part of the maxillary complete denture by remaining anterior natural teeth. He felt that these forces led to resorption of the maxillary labial plate, and subsequent 'tipping' downwards of the posterior section of the maxillary complete denture into

which the tuberosities enlarged due to 'negative pressure'. Kelly advised the prevention of this condition through the use of impression techniques that distributed forces evenly across the edentulous ridge, and by the provision of an appropriate occlusal scheme. Recognizing the significance of this latter factor, he advocated retention of natural mandibular posterior teeth including those that were not in good condition and requiring 'endodontic and periodontic' treatments.

Although this condition was first described over 30 years ago, the problems described then are still pertinent today. Epidemiological studies report that 'flabby ridges' have been observed in up to one-quarter of edentulous maxillae – most frequently in the anterior maxilla³ – and that such 'flabby ridges' may also be found in association with enlarged maxillary tuberosities.^{1,2} Such enlarged tuberosities pose significant difficulty in achieving a correctly oriented occlusal plane and this can adversely affect the stability and retention of the final prosthesis.

The purpose of this article is to describe the prosthodontic management of a patient who presented with features of the 'combination syndrome'.

Case Report

A 58-year-old male was referred to the Prosthodontic Department of the Bharti Vidyapeeth Deemed University Dental School and Hospital (Pune) for dental treatment to overcome his difficulty with his existing maxillary complete denture. The patient had a medical history including diabetes mellitus from 15 years. The patient reported that his maxillary complete denture was 'not fitting well'. On examination, the patient had an edentulous maxilla and natural mandibular anterior teeth with some retained posterior teeth. The anterior maxillary ridge was quite mobile offering compromised support for any complete denture resting on it.

The lower anterior teeth were supra-erupted (fig. 3). The maxillary tuberosities were enlarged, thereby reducing the amount of inter-ridge space available for placement of prosthetic teeth. The patient reported that his maxillary arch had been edentulous for over 15 years, and he had his existing mandibular dental configuration for a



similar length of time.

He reported that he had worn one mandibular removable partial denture for 3 years without success. Following clinical and radiographic examination, it was evident that insufficient maxillary bone was available for placement of dental implants, and the prognosis for successful implant treatment was limited by the patient's medical history and economical conditions.

After discussion with the patient regarding these factors, it was agreed to provide him with a new complete maxillary denture (utilizing a selective pressure impression technique), and a mandibular removable partial denture. Balanced articulation would also be indicated for these prostheses to ensure even distribution of occlusal forces on the residual ridges, and to avoid the introduction of 'interfering' or displacing contacts.

Non-surgical periodontal treatment and restorative treatment was completed as necessary on the standing natural teeth. A preliminary impression of the maxillary and mandibular arches was made with a low viscosity irreversible hydrocolloid material (Alginate impression material), thus ensuring minimal distortion of the displaceable ('flabby') tissues. A spaced custom tray was fabricated for the maxillary impression. Tissue stops were included in the design with a window for flabby tissues to accommodate without compression in the custom tray and modified using greenstick plastic impression compound (Green Impression Compound; DPI pinnacle) to ensure accurate location of the impression tray. Careful attention was paid to border moulding the impression with greenstick plastic impression compound accurately. An impression of the maxillary arch was made using Aquasil (medium body, base and catalyst paste impression material) and then flabby tissue area was recorded by light body VPS (3M ESPE express XT VPS impression material, light bodied consistency) (Figure 4). When complete, the impression was re-seated in the mouth to ensure its accuracy.

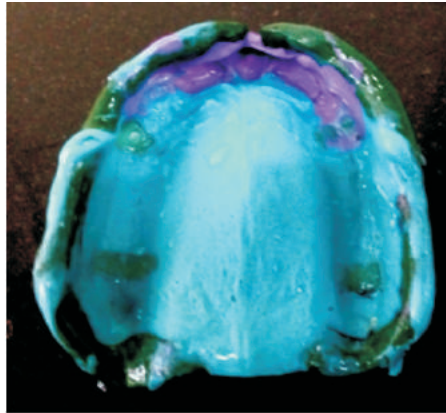


Fig. 4 A Selective Pressure Impression Technique

A Kennedy Class III division I removable partial denture was designed for the lower arch. The tilted abutment teeth are present due to not replacing the missing teeth over the period of time. The area for enameloplasty was determined by surveying the mandibular cast and the procedure carried out in the patients arch accordingly retaining adequate undercut only. (fig 5)

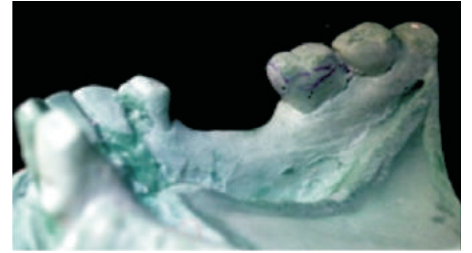
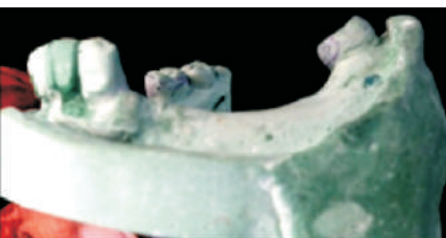


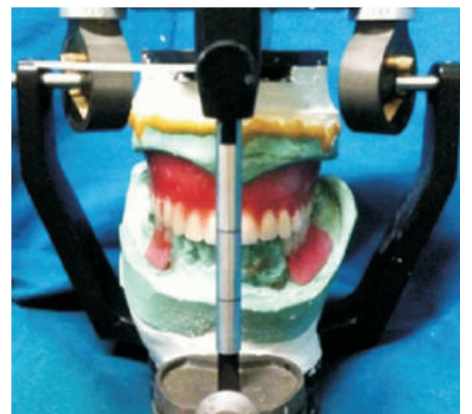
Fig 5. Enameloplasty

Fabrication of this prosthesis was carried out in the usual manner. At the occlusal registration stage, careful attention was paid to the position of the labial surface of the maxillary rim. The upper lip was found to be exerting a powerful posterior displacing force on the wax rim. The palatal position and shape of the wax rim was limited by the position of the over-erupted mandibular anterior teeth. Consideration was also given to the bucco-lingual shape of the mandibular wax rim to avoid 'cramping' the tongue. Following face-bow transfer (fig 6), the arrangement the teeth in balanced articulation on a Hanau articulator (fig. 7), paying attention to even tooth contact in excursive movements. Protrusive occlusal balance was included at this stage to prevent 'incisal locking' and destabilization of the maxillary denture. The stability of this tooth arrangement was confirmed at the 'try-in' stage.



Fig 6. Facebow Transfer

The dentures were delivered (fig 8) and, at subsequent review appointments, the patient reported satisfaction with stability, aesthetics and function of both the maxillary complete denture and mandibular removable partial denture.



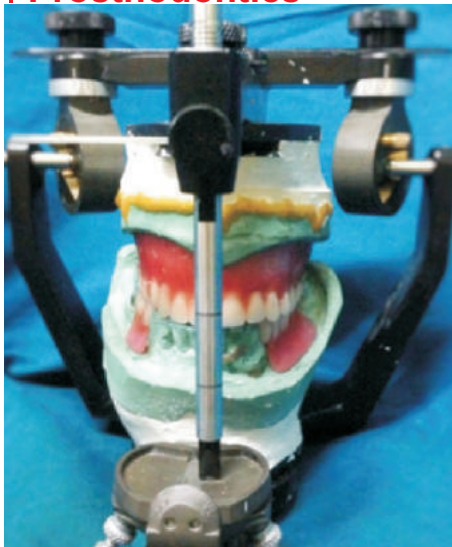


Fig 7 Balancing In Centric And Eccentric Relation

The key points of this treatment were:

- Recognition of abnormal oral anatomy (upper flabby ridge);
- Identification of the necessity of specialized impression technique; (selective pressure)
- Retention of mandibular posterior prosthetic teeth;
- Face-bow transfer – particularly useful in this case, allowing suitable orientation of the occlusal plane, and locating the arc of closure nearer to the hinge axis, reducing the likelihood of a premature contact;
- Arrangement of teeth on Hanau articulator to ensure balanced articulation.



Fig 8. Denture insertion

Discussion

The case demonstrate how the management of poor denture-bearing areas can be accomplished by expanding on the basic principles of complete denture construction, and without recourse to surgical implant procedures.

In the scenario described, patient was elderly, had limited bone available for retaining implants, and patient had medical history of diabetes and economical problems. Contemporary opinions warn that treatment outcomes associated with the use of implants in the maxilla may not be as predictable as in the mandible owing to variable bone quality.⁴

There is considerable variation in opinion in the dental literature as to the most appropriate choice of impression technique for complete dentures.⁵ When making definitive impressions for complete dentures, it is recommended that these should 'record the entire functional denture-bearing area to ensure maximum support, retention and stability for the denture during use'.⁶ It follows that the definitive impression should accurately record the tissues of the denture-bearing areas, in addition to recording the functional width and depth of related sulci.^{5,7,8} Two broad categories of impression techniques are generally described: the mucostatic (non-displacive) approach,⁹ or the muco-compressive (displacive) approach.¹⁰ Some authors have concluded that, while mucostatic impressions record the denture-bearing areas at rest (hence the fitting surface of the resultant denture represents the undisplaced denture-bearing areas and is theoretically more retentive), occlusal forces will not be as evenly distributed across the denture-supporting tissues as they are when an impression is recorded using a muco-compressive (tissue-displacing) impression technique. While there is no evidence to indicate that one technique produces better long-term results than another,⁷ certain clinical scenarios may be more suited to one particular technique.

A particular problem may be encountered when the denture-bearing area contains both mobile and non-mobile tissues. Most 'conventional' impression techniques for maxillary complete dentures could be considered to some degree as 'muco-compressive' impressions (i.e. using close-fitting custom trays and high viscosity impression materials; the denture-bearing area is compressed).^{7,8} This technique has been regarded as useful in gaining optimal support from the underlying denture-supporting areas.^{7,8}

However, where extensive 'flabby' areas are encountered and compressed during impression making, these will tend to 'relapse' and dislodge the resulting overlying complete denture when it is not subjected to occlusal loading.⁸ A number of techniques have been described for making impressions of denture-bearing areas containing both displaceable and non-displaceable tissues, including the use of separate impression materials in a single impression tray;⁵ use of two impression materials which are then related intra-orally;¹¹ and

the selective manipulation of the thermoplastic properties of compound impression material.¹²

Some authorities advocate surgical removal of mobile tissues prior to impression making. Neither the patients nor the authors were enthused by this prospect. Such a procedure would lead to reduction in the depth of the sulcus available for retention and, as one author has noted, while the flabby ridge may provide poor retention for the denture, it may still be better than no ridge at all.³ The authors were also reminded of the principal aim of prosthodontic therapy cited by DeVan, 'the preservation of what remains, not the meticulous replacement of that which has been lost'.^{13,14}

Two further points bear mentioning from the clinical reports described: first, the use of a well border-moulded selective pressure impression technique overcame the retentive inadequacies of the denture-bearing area without the need for surgical intervention. In a 'conventional' completed denture scenario, failure to achieve adequate peripheral seal of a complete denture in terms of both the functional depth and width of the sulcus may result in loss of retention. The significance of adequate border-moulding in the scenario described, where the amount of denture support available is already compromised, is evident.

Proper orientation of the occlusal plane and provision of proper balancing tooth contacts in excursive movements prevented 'tipping' of the denture and loss of the much-sought retention during function. Arranging the teeth on a Hanau Wideview articulator was particularly effective in achieving this occlusal scheme. An incorrectly oriented occlusal plane will subject the resulting denture to unfavorable forces,¹ further destabilizing a denture that is already relying on poor denture-bearing tissues. It also follows that the occlusal scheme for any dentures resting on displaceable tissues should be carefully designed to avoid incorporation of occlusal interferences, the presence of which will negate the retention of the denture.

Conclusion

This case demonstrate, how a patient with Combination Syndrome can be treated in the dental surgery without involving surgically invasive techniques.

The case described has some important points:

- Recognition of aberrant anatomy of the denture-bearing areas (e.g. 'flabby ridges');
- Understanding that specialized impression techniques should be considered;
- both retention and stability are essential features for success, e.g. incorporation of occlusal interferences will negate any 'hard-earned' retention;

Appropriate choice of prosthodontic technique, combined with the skill of the practitioner, increases the possibility of the management of the combination syndrome, while also avoiding invasive procedures.

References

References are available on request at editor@healtalkht.com

