

Rehabilitation of a Completely Edentulous Patient using Cheek Plumper Prosthesis and Neutral Zone Technique. : A Case Report

Chaudhary A¹, Aggarwal A¹, Sharma A², Bansal A³

Abstract

Complete denture therapy is an age old form of dental treatment. Ridge atrophy poses a clinical challenge towards the fabrication of a successful prosthesis. Extreme resorption of the maxillary and mandibular denture bearing areas results in sunken appearance of cheeks, unstable and non retentive dentures. This article describes the step by step fabrication of a complete denture using neutral zone technique along with cheek plumpers attached to ensure a stable and aesthetic complete denture.

Keywords: Ridge Atrophy, Residual Ridge Resorption, Admix Impression, Neutral Zone, Cheek Plumper Prosthesis.

Introduction

Stability of lower complete dentures is well recognized as a potentially difficult treatment aim to achieve. Looseness and discomfort are the most frequent complaints reported by patients and they are quite often difficult to manage by dentists. Neuromuscular control is said to be the key determinant of stability of lower complete dentures as the area available for support is far less than maxillary support area. Size and position of prosthetic teeth and the contours of polished surface have a crucial role in lower complete dentures stability as they are subjected to destabilizing forces from the tongue, lips and cheeks if they are placed in hindrance with function of these structures.

Throughout time, many concepts and theories emerged to describe where teeth on complete dentures should be positioned.¹ Some of them adopted mechanical principles, others used

biometric guides and a minority advocated mathematical formulas based on natural teeth position and dimensions.^{2,3} These dogmatic or arbitrary approaches have been challenged and found insufficient, in fact not only by rigorous research, but also by failure to restore function, aesthetic and comfort in patients with severely atrophic mandibular ridges. To overcome such problem, the neutral zone technique was advocated.

Slumped or hollow cheeks can add years to a person's age and hence have a detrimental psychological effect on the patient. While replacing missing teeth, it is important that the prosthesis not only replace the missing teeth but also restore the facial contours. Proper extensions and contours of denture flange can help to achieve this. However in some cases like patients with hollow cheeks, extra support has to be provided. This can be done

Corresponding Author : Dr Aditya Chaudhary, Senior Lecturer, Dept of Prosthodontics, ITS Dental College, Hospital and Research Centre, Greater Noida. (M) 9868911499

1 Senior Lecturers, Department of Prosthodontics, ITS Dental College, Hospital and Research Centre, Greater Noida.

2 Professor & Head, Department of Prosthodontics, ITS Dental College, Hospital and Research Centre, Greater Noida.

3 Post Graduate Student, Department of Prosthodontics, ITS Dental College, Hospital and Research Centre, Greater Noida

using cheek plumper or cheek lifting appliances.^{4,6}

This article describes a case report of a completely edentulous patient having atrophic mandibular ridge complimented with hollow or slumped cheeks.

Case report

A sixty five year old male patient reported to the Department Of Prosthodontics, ITS Dental college, Greater Noida, with the chief complaint of replacement of existing dentures. The patient gave a history of loss of teeth over a period of fifteen years. The patient had been wearing a complete denture prosthesis since then. The existing dentures were loose and ill-fitting causing discomfort to the patient. He was also not happy with the sunken appearance of his cheeks.

Clinical evaluation revealed resorbed maxillary ridge with sunken cheeks, atrophic mandibular ridge and increased interarch space. The existing dentures were unstable and non retentive. So it was decided to rehabilitate the patient with a complete denture using the neutral zone technique with attached cheek plumpers as the patient was not interested in any surgical intervention.

Procedure

1. The primary impressions were made using impression compound.
2. Maxillary custom tray was fabricated using a full spacer design with additional wax relief over the anterior ridge, incisive papilla, mid-palatine raphe and tuberosity areas. Mandibular custom tray was fabricated to provide a space of 4 mm using two wax spacers for admix impression material.
3. Maxillary secondary impression was made using zinc oxide eugenol impression paste. The mandibular secondary impression was made using an admix of impression compound and green stick compound.⁷
4. Mandibular neutral zone impression was recorded using the anthropoidal pouch technique. In this technique, the mandibular wax occlusal rim was removed and retentive wire loops were attached to the acrylic resin record base. Compound was kneaded and adapted to the mandibular denture base.
5. Maxillary record base was placed in the patient's mouth followed by placement of the mandibular record base with softened compound. The patient was asked to carry out different functional movements like sucking, swallowing, smiling, licking the lips, whistling, pronouncing vowels and counting. Excess compound was trimmed away and the material was resoftened and placed back into the mouth asking the patient to repeat the functional movements.
6. Plaster index of the impression was made and the mandibular teeth were arranged in the neutral zone following the index.(Fig 1)



Figure 1: Plaster index of the impression.

7. Autopolymerising acrylic resin was used to form pattern for the attachment. Attachment consisted of a flat rectangular thin base connected by a neck to two balls of 3 mm diameter. The width of rectangular base was kept slightly short of the width of the plumper prosthesis. The attachments were casted using chrome cobalt alloy.(Fig 2)

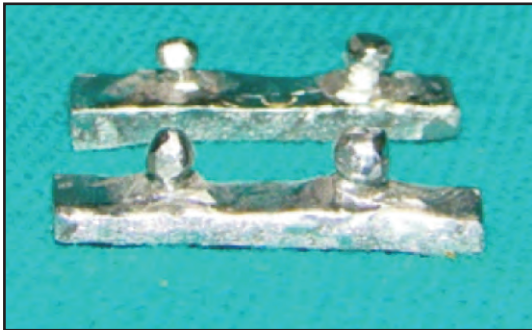


Figure 2: Casted attachments.

8. They were polished on all surfaces except the one which would be waxed in the denture as the surface irregularities aid in better retention of attachment to the trial denture base.
9. The waxed plumper prosthesis was repositioned over the attachment and required corrections were done during the trial phase taking in consideration the patient's cheek fullness.
10. Wax pattern of plumper was then invested and acrylised separately and the dentures were acrylised separately using the conventional approach.
11. Separators were placed over the metal attachments in the denture. These were then picked using autopolymerising acrylic resin in the plumper part. These separators allowed close approximation of the plumper with the denture and also facilitated removal from the denture.

(Fig 3)

12. Patient was instructed on the use of plumpers and dentures were delivered after evaluating them for fit and aesthetics. Recall appointment were scheduled after 1 day, 1 month and every 6 months.(Fig 4)

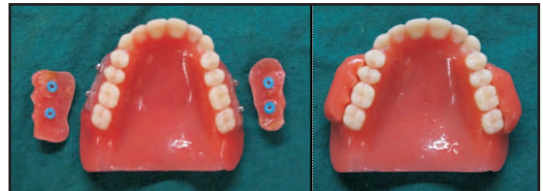


Figure 3: Acrylised maxillary denture and cheek plumpers with seperators placed.



Figure 4: Pre-treatment & Post-treatment Photograph

Discussion

Many approaches to set teeth have been advocated and used in complete denture treatment. However, there is substantial debate on which of these provide optimal position in the facio-lingual dimension and guarantee a favourable outcome in terms of stability, facial support, chewing efficiency, aesthetics and patient comfort.

Some authors adopted a mechanical concept and advocated setting teeth directly in the centre of denture support area where the least amount of leverage is present which in turn enhances the stability of lower complete denture.⁸ All of these approaches were and are still being used and each of them proved to

have advantages and disadvantages when compared to others. Furthermore, these approaches seem to work best when used with patients who have; their oral and peri-oral musculature unaltered for any reason, adequate neuromuscular control and acceptable amount of residual ridge for support.

Neutral zone technique has been criticized based on claims that it is supported by empirical evidence. However, other authors maintain that this is inaccurate as neutral zone technique is based on significant clinical observations on the role of destabilizing forces the muscles apply to complete dentures during functional movements. Furthermore, the large number of case reports accumulated in a short period of time and clinical studies conducted by Stromberg & Hickey⁹ and Fahmy & Kharat¹⁰ undermine this criticism and add to the validity of neutral zone technique. Stromberg & Hickey found better patient adaptability to physiologically formed denture bases when compared to conventional ones.

The detachable plumper prosthesis was planned in this case to reduce weight of the final prosthesis and to allow ease in placement of the prosthesis. Detachable plumpers enabled the patient to remove the plumpers and use the denture if required.¹¹

Conclusion

This article has described a simple, effective and non invasive treatment alternative to improve facial appearance in a patient with hollow cheeks. An effort was made to improve patient's appearance along with providing a better neuromuscular adaptation of the denture and thus better acceptability to the patient.

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