CASE REPORT

Prosthodontic Rehabilitation of a Completely Edentulous Arch with an Abnormal Jaw Relation: A Case Report

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Received on: 28 July 2023; Accepted on: 18 August 2023; Published on: 30 December 2023

Abstract

Cross arch teeth arrangement method is long being used for the management of abnormal jaw relation. The jaw relationship with broad mandibular arch may require a cross-bite occlusion of part or all of the artificial teeth, depending upon the extent of the discrepancies in their sizes. The cross-bite arrangement of anatomic posterior teeth is one in which the maxillary teeth are placed lingual to the buccal cusps of the mandibular teeth. There are many variations of the cross-bite relationship. The arrangement of artificial teeth is an art based on the biomechanical factors governing the ultimate success of the dentures. This article discusses prosthodontic rehabilitation of a broader posterior ridge of mandible with normal anterior relation with morphologic teeth management.

Keywords: Abnormal jaw relation, Case report, Cross arch arrangement, Occlusal scheme.

INTRODUCTION

Multiple factors like retention, stability, and support success are important for better prognosis in complete denture. If relation of jaw is abnormal, it is difficult to achieve optimum function and esthetics. Proper extended impression, maximum area coverage, correct arrangement of teeth, and well-contoured polished surface area of the denture must be considered for better prognosis of these cases.

This case report highlights the prosthetic rehabilitation of completely edentulous patient with simple modifications to manage a mandibular arch which was wider posterior region.

CASE DESCRIPTION

A 55-year-old patient reported to the Department of Prosthodontic, Crown and Bridge with a chief complaint of broken denture and wants a new set of denture. On extraoral examination facial profile was convex, symmetrically asymmetrical. On palpation the temporomandibular joint (TMJ) showed no clicking sound and the lymph nodes were normal. On intraoral examination, the oral mucosa was normal, the arch form of maxilla and mandible was U shaped and ridge form was high well rounded but the mandibular arch was wider in the posterior region than the maxillary arch (Figs 1 and 2). No other abnormality was detected.

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intraorally. The patient was diagnosed completely edentulous maxilla and mandible.

With due consent, the patient was motivated and educated for the treatment plan. The preliminary impression of both the edentulous jaws was made using compound (Rolex impression composition, India) and primary cast was obtained (Fig. 3). Custom trays were fabricated. Border tissues were recorded with green stick (DPI Pinnacle Tracing Sticks, India) and the secondary impressions with zinc oxide eugenol paste (DPI Impression Paste, India) were made and the final cast was obtained (Fig. 4). Maxillomandibular relations were recorded. The record was then mounted on an articulator. Teeth selection was done. Anterior teeth were arranged in a conventional manner and posterior teeth were crossed, upper to lower and opposite side and vice versa. The upper first premolar was skipped for better intercuspal relationships and stable occlusion (Fig. 5). The try-in was done and due approval of the patient was taken (Fig. 6). The dentures were processed with conventional technique and inserted in patient’s mouth. The post insertion instructions were given and the patient was very comfortable (Fig. 7). The patient was reviewed after the 24 hours and a week. The patient was satisfied with esthetic and function. On clinical examination and questionnaire answered by the patient, data were collected (Fig. 8 and Table 1).

**Discussion**

Anatomic changes take place within the alveolar ridges subsequent to dental extractions. A series of adaptive changes takes place due to loss of teeth and altered functions within and around the socket.
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Figs 5A to C: Teeth arrangement

Figs 6A to C: Try in of denture (right, left and front view)
Proliferation and migration of the epithelial tissue begins in the first week. Within six months, tissue integrity and bone is formed. The major support area for complete denture is residual ridges. Success in removable prosthesis is partly dependent on the size of the residual ridges. Resorption of the residual ridge is more in the first six month, but the bone resorption continues whole life but at slower rate, resulting in the loss of a large quantity of jaw bone. Progressive resorption of the residual ridges makes the maxillae narrower and the mandible wider. The change in the size is due to direction of bone resorption. A severe discrepancy in the arch width results in a cross-bite situation.

In case of abnormal jaw relations, the crest of bone of lower jaw is located more buccally as compared with the maxilla. So during arrangement of teeth, there is abnormal occlusal relationship of teeth especially posterior teeth. There are various methods to overcome this problem. If the abnormality is small, slight modification is done in maxillary teeth placing buccally. Sometimes, this leads to abnormal non-axial forces, cause fracture of the denture.

Another method to overcome the problem due to the abnormal jaw discrepancy in posterior region is by use of non-anatomic teeth. According to Sutton and McCord, the complete dentures with lingualized or anatomic posterior occlusion have better self-perceived acceptance. If the abnormality is more, cross-arch arrangement of posterior tooth is advisable.

This case report highlights a case of mandible with wider posterior arch and normal anterior relation, the prosthodontic rehabilitation was done with cross arch teeth arrangement method. In this type of arrangement, upper right posterior teeth were shifted to the lower left. This arrangement was done according to LaVere and Freda. This was necessary to obtain satisfactory multi-cuspal occlusal relationship for better function.

There are many studies reporting on the arrangement of teeth and occlusion schemes in complete denture cases, but there are sparse case reports on it. Tambe et al. reported the management of the oral submucous fibrosis and the abnormal

Figs 8A and B: Pre- and post-insertion of the denture

Table 1: Patient satisfaction questionnaire

<table>
<thead>
<tr>
<th>Patient satisfaction questionnaire</th>
<th>Agreed</th>
<th>Disagreed</th>
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<tbody>
<tr>
<td>1. I was satisfied by the treatment given to me</td>
<td></td>
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<td>2. I was comfortable in closing my teeth (maximum intercuspation) and talking (speech) at the end of the treatment</td>
<td></td>
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<tr>
<td>3. I was happy with my looks (esthetics)</td>
<td></td>
<td></td>
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<tr>
<td>4. I was able to chew (mastication) at the end of the treatment</td>
<td></td>
<td></td>
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<tr>
<td>5. The doctor listened to my complaints during the treatment and catered to them</td>
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jaw relation with cross-arch teeth arrangement\textsuperscript{7} without compromise in biomechanical factors.\textsuperscript{8} Irrespective of jaw relation, the development of occlusion should be done to have better function and least trauma to the supporting structures. The basic fundamental principles of teeth arrangement remain the same. Till date, no superior form of tooth arrangement in a particular patient has been advocated.\textsuperscript{9} So a dentist should be aware about the change in basic principles.

**Conclusion**

In this case report, the rehabilitation of the mandible with wider posterior arch was done and managed with cross-arch teeth arrangement method. The better prognosis and success of complete denture rehabilitation depend on multiple factors. So one should understand the correlation of all.

**References**