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RESEARCH ARTICLE

PROSTHETIC REHABILITATION ON RESORBED RIDGE: A CASE REPORT

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Abstract

Residual ridge resorption is a term used for the diminishing quantity and quality of the residual ridge after the teeth are extracted. Compared to maxilla the mandibular ridge shows more resorption. The denture becomes passive due to poor neuromuscular control, difficulties facing during impression making, mastication, swallowing which in turn leads to loss of retention and stability to the complete denture. Presence of flabby tissue even worsen the condition after wearing ill fitting prosthesis for a prolonged period. Successful denture treatment in situations like this can become increasingly dependent on the modified impression techniques, position of the denture teeth and external contour of the denture. This is a clinical report where modifications of impression techniques like admixed technique, window impression technique and neutral zone technique have been incorporated to provide best possible retention, stability and support to the complete denture.

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Introduction:-

Resorption of mandibular ridge is a multifactorial and biomechanical disease that is chronic, progressive, irreversible and cumulative leading to loss of vestibular depth, vertical dimension and decrease in lower facial height.¹ That problem has to do with the fact that the residual ridge to which prosthesis is meticulously fitted change shape and reduced in size at varying rates in different individuals and in the same individual at different times.² It has been generally seen that the lower denture is relatively less stable than the upper one with increasing life expectancy, age related reduction in adaptability and progressive mandibular resorption. Making impression of an edentulous arch can be challenging when the residual ridge is less than ideal. Use of conventional impression techniques can result in a distorted impression. Hence the technique needs to be modified. If resorbed ridge present with flabby tissue the condition becomes even more complicated. Construction of denture over flabby tissue is an arduous task. Treatment modalities include surgical excision of flabby tissue, implant supported denture or modification of conventional method. Surgery and placement of implant depends on patient's systemic health and requirement of the patient, extent of flabby tissue, economical status of the patient and obviously skill of the prosthodontist.³ Proper arrangement and position of the teeth in atrophic mandible can provide stability to the denture. Neutral zone technique is most effective for patients having unretentive dentures due to resorbed ridge.⁴ This is a clinical case of resorbed ridge with flabby tissue where modified impression techniques and neutral zone technique have been advocated to rehabilitate the patient with complete denture providing best retention, stability and support.

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Case Report

A 47 year old female patient came to the department of prosthodontics with history of previous denture and chief complaint of loose lower denture. On examination it revealed complete edentulism in both arches. Lower ridge was resorbed with flabby tissue present in the anterior region. Conventional method was followed for complete denture fabrication in maxillary arch. Modified impression techniques were followed for construction of lower denture i.e primary impression was recorded with Mc.cord's technique, definitive impression was taken with window technique and neutral zone was recorded for teeth arrangement .

Step1

The primary impressions were made with stock tray. Mc.cord's technique (admixed technique) was used for mandibular impression. It is a combination of impression compound (DPI, Pinnacle) and green stick compound (low fusing) taken in a ratio of 3:7 and was softened in a water bath in 65 degree C.

Step 2

After taking primary impression primary casts were obtained by pouring it with plaster of paris. Extension of flabby area was marked with the help of marking pencil on the mandibular primary cast.

Step3

Acrylic (DPI cold cure, Dental products of India, Mumbai) special trays were fabricated for final impression. Conventional impression was taken for maxilla. The borders of the special tray were reduced 2 mm short from the sulcus for border moulding. Border moulding was performed with the help of low fusing impression compound (DPI, Pinnacle, Tracing sticks, Dental Products of India, Ltd). Window was prepared in the custom tray in the area of flabby tissue using round bur and fissure bur.

Step 4

Secondary impression was made with zinc oxide eugenol impression paste (DPI) after removing the spacer. Excess material near the window region was cut off with scalpel blade and the flabby area was recorded using impression plaster. Impression plaster was injected with a syringe in proper consistency into the flabby area, exposed through the window made in the special tray.

Step 5

Separating media over the plaster part of the impression was applied before pouring it with type III dental stone (Kalstone, Kalabhai) to obtain the master cast.

Step 6

The occlusal rims were fabricated on acrylic denture bases. Jaw relation was taken after establishing the vertical height. Casts were articulated.

Step 7

Impression compound and green stick compound was taken again in 3:7 ratio. After softening the compound was kneaded and a roll was formed according to the crest of the lower ridge. The attached roll of compound reheated in water bath with the record base firmly seated in position.

Step 8

Patient was asked to perform various functional movements like swallowing, speaking, puckering, pursing lips, pronouncing vowels, protruding tongue etc. These actions simulated physiologic functioning and moulded the material by muscle activity.

Step 9

Then it was removed from the patient's mouth after the material was set and then it was transferred to the master cast. A silicone putty (Dentsply, India) index was made around the compound occlusal rim.

Step10

Then the admixed compound rim was removed and replaced with modelling wax to reproduce the neutral zone.

Step 11

Teeth arrangement was done in neutral zone position. The position of teeth was rechecked by placing the index around the arranged teeth. The maxillary teeth were arranged according to the location of mandibular teeth.

Step 12

Try in was done.

Step 13

Dentures were processed in conventional manner and final insertion was done. Patient was recalled for follow up and found her to be quite satisfied with the new denture.

Discussion:-

The art and science of complete denture fabrication in various clinical situation has been debated over a century. Prosthetic management of such cases has been always a challenging task and amalgamation of different techniques have been involved to face the challenge. A functional impression should record the entire denture bearing area, relief area and limiting structures to provide maximum retention, stability and support. Difficulty arises when the quality and quantity of denture bearing area is not ideal. Condition becomes even more critical when there is resorbed ridge with flabby tissue. Construction of denture in such ridge is a challenge for the prosthodontist. This was a case of resorbed mandibular ridge with flabby tissue present anteriorly. So the impressions technique were modified while taking both primary and final impressions. In case of primary impression Mc Cord and Tyson's technique was used for flat mandibular ridge⁵ impression compound and green tracing stick compound in the ratio of 3:7 parts by wt were used in a bowl of water at 60 degree C and kneaded to a homogenous mass that provided a working time of 90 seconds. The use of low fusing compound which has less compressibility on the tissues, better flow and handling characteristics made the job easier to record the details accurately.⁴ Final impression was taken with modified technique rather than the conventional one. Management of flabby tissue is possible with surgical correction where adequate bone height is present. In case of resorbed ridge surgery is not a viable treatment option. Changes in impression techniques can be a feasible alternative. Conventional impression techniques used for flabby tissue can result in compromise in retention and unstable denture. Creating windows or holes in special tray decrease the hydraulic pressure during impression taking. Thus minimizing the distortion of hypermobile tissues. This recorded the flabby tissue in undistorted form⁵ providing adequate retention, stability to the prosthesis. Rest of the tissues were recorded in functional form. Patient's who deny implant therapy or not suitable for implant placement can be treated by fabricating denture using non invasive modified impression techniques. Denture constructed over highly resorbed ridge using neutral zone technique distributes the muscular forces and inhibits denture dislodgement during function. Over the years a variety of materials have been used to record the neutral zone. Here admixed material was used to record the neutral zone. The mixing of low fusing compound with the impression compound results in a low viscosity material allowing for ease in manipulation, better flow and accurate impression.



1(a)



1(a)

Fig 1:-Complete edentulous maxillary and mandibular arch.



Fig 2:-Primary impression of mandibular arch taken with admixed technique.



3(a)



3(a)

Fig 3:- Final impression taken with window impression technique for mandibular ridge.



Fig 4:- Putty index made around recorded neutral zone.



Fig 5:- Modelling wax poured in neutral zone.



Fig 6:- Teeth arrangement done in neutral zone.



Fig 7:- Post insertion view of complete denture.



Fig 8:- Frontal view of patient without or with denture respectively.

Conclusion:-

In case of oral rehabilitation in geriatric population many factors contribute to the overall performance of successful complete denture. In this present case a combination of various techniques have been utilized to restore masticatory efficiency and improve comfort and esthetics for a completely edentulous patient having resorbed mandibular ridge with flabby tissue.

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