



IMPRESSION TECHNIQUES FOR THE RESORBED MANDIBULAR ARCH- A GUIDE TO INCREASED STABILITY

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ABSTRACT

All clinicians face the common problems in making complete denture prosthesis for patients exhibiting high degree of bone resorption. Though resorption can be prevented to an extent but sooner or later it comes back to haunt the clinician. The result is a dissatisfied patient with a loose prosthesis ready for a new one. The real problem lies in the capturing the oral tissues and using them for creating retention and stability in the prosthesis. Though ultimate success also depends on many other factors such as the occlusal scheme used and patient adaptability yet the most important step still remains the impression technique employed. A few impression techniques are suggested for increasing the success rates in such patients.

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INTRODUCTION

Better medical facilities have led to many achievements; most notable among them is the increased human life expectancy. Increased human life expectancy has led to geriatric patients living a more fruitful and productive life. Overall, the general quality of life has improved in leaps and bounds. As the life span has increased, the prosthetic patients demand a more efficient and capable masticatory apparatus. Also because of increased fluoridation of water in different parts of world, the incidence of edentulism has decreased. Still there are patients who are completely edentulous and need complete denture prosthesis. More importantly there are patients who wear ill fitting dentures as there is poor stability and retention especially in the mandibular arch because of tissue abuse due to continuous wear of the same prosthesis for longer period or laxity on the part of clinician. This article aims to suggest a few impression techniques for increased stability of the mandibular arch and improving the prognosis of the prosthesis.

Tackling the problem: Though there have been problems with regards to the mandibular denture since the advent of complete denture prosthesis, yet no practical solutions to the problem were advised or devised.

The result is that though patients enjoy a high degree of chewing efficiency with maxillary denture, the same cannot be said about the mandibular denture. The solution lies in careful execution of the treatment plan which is devised after proper examination and diagnosis. Let us divide the problem strategically and find out the solutions accordingly. The crux of the problem lies in incorrect diagnosis on the part of the clinician. While examining a completely edentulous patient, the most notable things that should be noted by the clinician are as follows:

- 1) Amount of resorption in the mandibular arch
- 2) Tongue position in the floor of the mouth – whether retracted or normal
- 3) Soft tissue contouring present on the crest of the bone.
- 4) Whether any hypermobile or fibrous tissue is present on the ridge.

Amount of bone resorption can be evaluated using the "Atwood's classification" which is described as under: (according increasing time duration since extraction)

- a) Pre extraction
- b) Immediate post extraction

- c) High well rounded
- d) Low well rounded
- e) Knife edge
- f) Depressed.

The clinicians usually can determine to which class the patient belongs by finding out the duration of edentulousness and by examining the oral cavity

In case the resorption in the arch is extreme, the impression technique has to be modified accordingly. Moreover, the tongue plays an important role in the retention of the mandibular denture. Due to prolonged period of edentulousness, the tongue might attain a retracted position and hence the obtaining a lingual seal for the retention of the mandibular denture might be very tough. To train the tongue to get back to its normal position, an acrylic ball might be placed on the lingual surface of the mandibular denture, Mandibular anterior teeth. This will irritate the tongue and the exercise will force the tongue to turn back to its normal position. The continuous wearing of prosthesis for a long period of time may result in denture abused oral tissues. The clinical features include presence of hypermobile tissues, especially on the crest of the ridge and fibrous folds of tissue elsewhere in the arch. The corrective measures involve restoring the tissues back to health by the use of gingival massage, tissue conditioners and modification in the impression technique after border moulding. Moreover a lot depends on the type of occlusal scheme employed and the teeth used for the teeth arrangement. It is generally argued that in cases exhibiting high degrees of bone resorption, non anatomic teeth should be used but in fact they lead to even higher degree of bone resorption. Balanced occlusion scheme serves best for the patient since it imparts a higher degree of masticatory efficiency and increased stability to the prosthesis.

The Impression Techniques

Following are the different impression techniques that can be used for resorbed mandibular ridges:

- The functional impression technique.
- The admixed technique.
- The neutral zone technique.

Functional impression can be used very effectively to create stability in cases exhibiting extreme resorption. Though retention is usually poor in such cases yet the clinician can set out to achieve stability in these patients. The prosthesis should remain stable within the oral cavity and not move at the slightest movement of the tongue.

A functional impression can be made after doing the border moulding using a stable custom tray. Temporary soft liners and tissue conditioners can be used as functional impression materials as they exhibit the property of delayed setting and a continuous over a longer period of time thereby recording all possible movements of the mandibular musculature.

- A) The extensions of the custom tray should be verified accurately and border moulding done.
- B) After completion of the procedure, instead of using the regular impression material for making definitive impressions, a functional impression material can be used.

- C) The material is mixed and placed on the impression surface of the custom tray.
- D) The material is initially moulded using the regular movements of secondary impression making technique.
- E) Once the material attains an initial set, the patient is instructed to read a newspaper aloud, drink water 3-4 times, and swallow saliva at regular intervals and other daily chores.
- F) The functional impression material stays within the oral cavity for a period of 45 min to 1 hr. All oral activities of the patient are encouraged.
- G) Once the material has achieved a final set, the tray is removed and the impression is poured. (Fig 1)
- H) The cast obtained is used as a master cast for fabrication of prosthesis.



Fig 1. Functional impression, temporary soft liner was used to record the impression

The Admixed Technique: It has been observed that in cases exhibiting high degree of resorption, more the denture covers the basal seat area, the better the stability of the prosthesis. To gain as much coverage of the basal seat as possible, an admixed technique is advocated. It involves making of a primary impression by mixing impression compound and Greene stick compound in the ratio of 3:7. The result is a composite material exhibiting greater flowability and hence better recording of details. This technique is quite useful in poor ridge cases.

Neutral zone impression technique: Though all of us realize the importance of neutral zone yet no one tries to use it for increasing the stability in complete denture prosthesis. If done correctly, the neutral zone can increase the stability and retention to a great extent. Recording the neutral zone is itself quite simple.

- A) After taking jaw relations, the maxillary and Mandibular cast is mounted using a face bow transfer.
- B) Thereafter the Mandibular wax rim is cut off and wire loops in the shape of letter "v" are made on the lower record base up to the height of the Mandibular wax rim. (Fig 2)
- C) Now the Maxillary record base is placed in the oral cavity.
- D) Functional impression material is placed within these loops on the lower record base and it is placed within the oral cavity.
- E) The patient is instructed to say words like "ooo", "aaa", and "eee". Pronouncing these words leads to recording of neutral zone existing in the mouth.
- F) Functional impression is added incrementally at regular intervals in these loops till the time the record base shows adequate retention within the mouth. (Fig 3.)

- G) Plaster indices are poured around the recorded neutral zones and thereafter, the loops are dismantled from the record base. After placing these indices, a new occlusal rim is made within the area of plaster indices, which serves as a guide for future teeth arrangement. (Fig 4.)

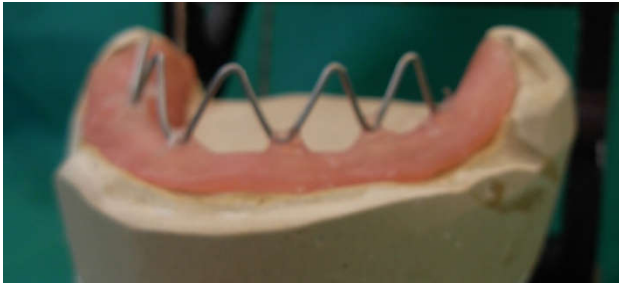


Fig 2. Loops made for recording of neutral zone



Fig. 3. Neutral zone recorded



Fig 4. Plaster indices made

DISCUSSION

Creating stable prosthesis is the utmost aim for any clinician. Restoring the masticatory function and aesthetics can be most satisfying and rewarding for a clinician, more so in cases having high degrees of bone resorption. But the challenge is daunting and involves meticulous attention to detail and following the protocol properly. Though there are instances when in spite of doing the best technique possible, prosthesis have failed yet it is the hope of succeeding that keeps the human nature going. Moreover as Dr. M.M. Devan rightly said “the perpetual preservation of what remains is more important than the meticulous replacement of what is missing”.

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