



LOST SALT TECHNIQUE -REVISITED

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ABSTRACT Prosthodontic rehabilitation in patients with increased inter ridge distance is always a clinical challenge. In this clinical case report we have discussed the clinical management of a severely atrophic pre-maxilla and a moderately atrophic mandibular ridge. When interridge distance is increased and in such dentures the weight is high which in turn affects the retention of the maxillary denture which usually has a good retention. the main requirement for such cases is reduces weight of the maxillary denture so as to combat with gravity

KEYWORDS : Atrophic ridge, Hollow denture, Inter ridge distance

Introduction:

In general, maxillary dentures have good retention and support due to the good denture bearing foundation which is favoured anatomically. In Some patients physiologically and pathologically the ridge defects are irregular and thus the ridge resorption is not even and causes irregular resorption pattern creating an increased interridge distance. this may result in fabrication of a heavy maxillary denture that compromises the retention as reported by O' Sullivan et al in 2004. In such cases Brown et al reported that the weight reduction of maxillary denture is beneficial in reducing the leverage forces¹. By this we can rehabilitate the patient with normal function aesthetics and function. This article revisits the method of fabricating a hollow denture using the lost salt technique for an edentulous male patient with increased interridge distance and long lip. Literature dates back to 1950s were hollowing the denture was successful. And literature also reports various methods for hollowing the denture and each technique has its own advantages and disadvantages. Few examples of materials used for processing the hollow cavity are the use of dimensional spacer using dental stone, wrapped asbestos, silicone putty, modelling clay.

CASE REPORT:

A 67 years old male patient reported to our department with the complain of ill-fitting dentures. The patient had no significant medical history. Dental history reveals that the patient had been edentulous for a period of 25 years, a previous denture wearer and has changed 2 dentures so far. Extra oral examination reveals that the patient had a class 1 profile with the square tapering facial form. Intra oral examination showed the upper arch size to be medium with the U-shaped arch form and a large premaxillary defect. The premaxilla was severely resorbed and is Atwood's classification V7 and the inter ridge distance was excessive. On examining the old dentures retention of the denture both maxillary and mandibular arches were poor and the patient was very much dissatisfied with the dentures. Hence, hollow maxillary complete denture and conventional mandibular denture was planned for this patient.

Preliminary impression:

Preliminary impression of the upper and the lower arches complete were made with impression compound (HI flex impression compound) using metallic stock trays. Custom trays were prepared using self-polymerizing acrylic resin (DPI RR Cold cure. The Bombay Burmah Trading Corporation).

Final impression:

The custom trays made of auto polymerizing resin (DPI RR COLD CURE, The Bombay Burmah Trading Corporation) were evaluated intra orally for the extensions in both passive and active movements. For the maxillary and mandibular arch border moulding was done with low fusing green stick compound (DPI low fusing compound The Bombay Burmah Trading Corporation) and impressions were made with monophase polyvinylsiloxane (Figure 1a ,1b). Temporary

denture base was made over the master cast and occlusion rim was made in the upper.



Figure 1a Maxillary Definitive Impression



Figure 1b Mandibular Definitive Impression

Jaw relation:

A tentative jaw relation was done (Figure2) and face bow transfer was done and the casts were articulated in a Hanau wide Vue articulator. In this stage the maxillary occlusal rim had increased height and was visible invariably. The visibility of the upper teeth was marked in the occlusal rim and an anterior trial was alone done on the same visit (Figure 3). The articulated cast showed the inter-arch space and it was measured.



Figure 2 Jaw Relation

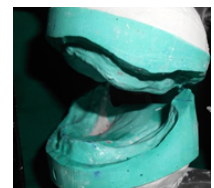


Figure 3 Inter-arch Space

Wax try in:

A completed wax trial denture was tried in the patient's mouth. Phonetics, retention, stability aesthetics were assessed. Once the wax try in denture was verified and the patient was also satisfied the dentures were processed the mandibular denture was processed in a conventional manner the maxillary denture had different steps in processing to make it hollow (Figure 4a,4b).



Figure 4a Teeth Arrangement



Figure 4b Wax Try In

Acrylising the hollow maxillary denture:

The maxillary denture was sealed to the maxillary master cast (Figure 5a). This was then invested and dewaxed conventionally to create a hollowness a putty spacer was fabricated (Figure 5b). This putty served as a spacer and this itself can be used to create the hollow denture but to retrieve the putty from the processed denture is cumbersome so this putty was used only to create a spacer and the case was filled with table salt and the second layer of heat activating PMMA was packed (Figure 6a) and acrylised in a conventional manner. The denture was retrieved and two holes were drilled with a micromotor handpiece in the first molar region on both right and left regions. Water was injected into the hole from one side till the entire salt gets dissolved and creates a hollow cavity (Figure 6b). Once the entire salt is removed the autopolymerising PMMA is used to close the drilled holes. Care should be taken to close only the holes and not to encroach the hollow cavity. The hollow denture is checked for its weight and the ability to float in a bowl of water. The denture had a buoyancy to float and thus serving its purpose by weighing –gms. The denture was polished and then seated in the patient's mouth (Figure 7a, 7b).

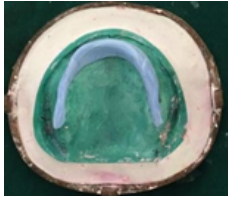


Figure 5a Putty index



Figure 5b 3D space created



Figure 6a Second layer of packing



Figure 6b water irrigation

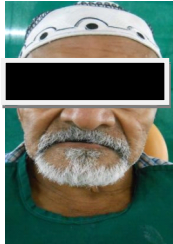


Figure 7a Pre-operative view



Figure 7b Post-operative view

Discussion:

Prosthetic rehabilitation of a patient with long lip length, increased interarch space due to increased ridge resorption, collapsed facial height with the dentures in conventional method always result in dentures that are too heavy and thus compromising the retention and also causing detrimental effect to denture bearing hard and soft tissue. In order to avoid such a hazard, the aim is to reduce the weight of the dentures by hollowing it without compromising the strength of the dentures.

Scrolling down through the literature there are many methods documented well enough for hollowing the denture. And this case report followed the lost salt technique as it is very easy to fabricate the denture Ackermann 1955 documented that hollowing a prosthesis drastically reduces the weight and increases the comfort for certain clinical situations¹. T. J. Nidiffer in 1957 quoted that lightness of the prosthesis does not cause excessive atrophy and physiologic changes in muscle balance². Alternatively, A. H. Grunewald, explained the importance of giving sufficient weight to lower denture instead of hollowing them³. Hollowing the maxillary dentures are well quoted in history and the methods vary diversely one among them is A simple, accurate method for processing a hollow obturator is described method is similar to the "two-step" processing technique used in complete dentures^{4,5,6}. Chaturvedi et al used dough of dental plaster – pumice and sugar syrup this dough is brittle and may break during compression molding, it may also absorb monomer and in this technique also

opening has to be made in the distal end to remove the spacer which may later compromise the seal of the denture^{7,8,9,10}.

The method in this case report has advantages over previously described techniques for the hollow denture fabrication. There is minimal extra laboratory procedure, there is no tedious effort to remove the spacer material, auto polymerizing acrylic resin shell also adds to the strength of the denture, color of auto polymerizing acrylic resin can be matched with heat cured acrylic resin thus enhancing esthetics, there is no chance of leakage. The technique is predictable and provides even space all around. The technique is economical and is performed using commonly available materials.

Conclusions

A technique for fabricating a hollow maxillary denture is described with the objective, emphasizing the need to preserve the remaining alveolar bone by the use of a hollow denture in situations where there is excessive resorption of the residual. The advantage of a hollow denture for severely resorbed residual alveolar ridges is the reduction in the excessive weight of the acrylic resin that may load the residual alveolar ridge.

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