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Original Article

Resin paint on technique- a new, simple technique for the beading and boxing of elastomeric impressions

Kiran Ram K[1], Shakila R[2], Ranukumari A[3]

[1]Junior Resident, [2]Professor, [3]Professor & Head, Department of Prosthodontics and Implantology, Mahatma Gandhi Post Graduate Institute of Dental Sciences, Gorimedu, Pondicherry-605006

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ABSTRACT

Aims & Objectives- The process of beading and boxing of complete denture impressions prior to their pouring serves many functions of which the reproduction of the width and depth of the sulcus recorded in the impression to the cast is the most vital. The use of elastomeric materials for impression making is very prevalent in contemporary prosthetic practice. The wax bead and box method is the most common method used. However, the wax cannot adhere well to the silicone and a poor bond results. A new method to improve the adhesion of wax to elastomer by using an intermediary layer of autopolymerising resin is suggested.

Materials & Methods- A new method to improve the adhesion of wax to elastomer by using an intermediary layer of autopolymerising resin is suggested.

Results- A new technique for the beading and boxing of elastomeric impression materials has been suggested.

Keywords: Elastomeric, Impressions, Beading, Boxing.

Address for Correspondence:
Dr. Ram Kiran K,
Department of Prosthodontics and Implantology,
Mahatma Gandhi Post Graduate Institute of Dental Sciences, Gorimedu, Pondicherry-605006
EMail id: kiranram@ymail.com

Introduction

The complete denture impression making procedure relies on the recording of the correct extension of the sulcus in the functional state. These result in the formation of the peripheral seal / border seal that forms the basis for retention of the denture. A well recorded sulcus can offer retention to a denture in even seemingly poor ridges.

The process of beading and boxing of the complete denture impressions before pouring preserves the extension, as well as the thickness, of the border; controls the form and thickness of the base of the cast, facilitates placing remounting plates in the cast; and conserves artificial stone.[1] Of these, the most important function is the reproduction of the thickness and extension of the border. If this is accurately reproduced in the master cast, then the retention of the denture is assured, provided other steps have been carried out in an acceptable manner. This important step although prevalent in the academic set up, is often not done in the practice or in laboratories. Only a clinician who knows the importance of maintaining the sulcus morphology will ensure that this step is followed in the laboratory or in the clinic.

The methods available to bead and box the master impression, according to Rudd, Morrow, and Brewer [2] are

1. Wax beading and boxing method
2. Plaster and Pumice boxing method
3. Caulking compound and paddle boxing method

The **wax beading and boxing method is one of the most simple and common methods used.** Rhudd, Morrow and Brewer have stated that the wax beading and boxing method is **effective** for Zinc Oxide Eugenol impressions and is usable for rubber base or silicone impressions, but only after thoroughly drying the impression before adapting the beading wax. Beading wax is available in rectangular or round strips. Orthodontic wax or utility wax can also be used.[2]

One of the errors that may occur with this technique is the separation of the wax from the impression if it hasn't been luted properly to the impression. **Vyas et al** have stated the difficulty of getting the wax to adhere to the elastomeric materials. The beaded and boxed impression should ideally demonstrate a water tight seal. This is serious problem especially when this technique is used with elastomeric impression materials. The rubbery nature of these materials causes the wax to easily separate from the underlying impression material. This may cause leaks of stone, or even voids or misshapen casts, in extreme cases.

Literature regarding the beading boxing of elastomeric impression materials is limited. Some alternate techniques include

1. **Reddy, Padmanabhan, Veerareddy, Chandrasekhar, Narendra**[3] – have suggested the use of a **preformed beading and boxing appliance** that uses a box like device that has an anterior latched door. The impression can be settled at the bottom of the appliance and clay can be filled to form the bead after which the doors are closed. The walls of the appliance will form the boxing. Into this, stone can be poured.

2. **Kulkarni P, Kulkarni R, Jain[4] –** have suggested a modified plaster and pumice boxing method in which the plaster and pumice beading is coated with a wax spacer to allow easy separation of the poured cast from the impression.
3. **Vyas, Maru, Bali, Jain, Shukla and Kataria[5] –** suggested the use of commercially available instant adhesive for tacking on the beading wax to elastomeric impression before using a layer of molten wax for extra adhesion.

Here, we aim to propose a new method for the beading of elastomeric impressions. The method involves a layer of autopolymerising resin that is painted onto the bead line. This was expected to form a micro roughened surface on the surface of the elastomer onto which the wax could easily be tacked on, and would retain. This could be thought of something similar to the production of a micro-roughened surface to improve adhesion of materials.

Methods

Armamentarium:

1. Clay
2. Nylon round / flat paint brush
3. Autopolymerising resin
4. Dappen dish
5. Rubber bowl
6. Gauze / Cotton cloth
7. Modelling wax/ beading wax
8. Wax knife
9. Bard Parker handle number three and blade number fifteen

Steps:

1. The impression **{Figure 1}** in which the technique will be demonstrated was one that was made for a patient with resorbed mandibular ridge with restricted mouth opening using the “all-green” technique utilising green stick compound (DPI Pinnacle tracing sticks, Dental Products of India, Bombay-Burmah Trading company, India) and light body consistency condensation silicone wash impression (Speedex Condensation Silcone, Coltene/Whaledent AG, Switzerland)
2. The impression after disinfection and drying is placed on the laboratory bench and by using blocks of clay or modelling wax is oriented such that the ridge portion is parallel to the horizontal.
3. Autopolymerising dental acrylic resin (DPI RR Cold Cure, Dental Products of India, Bombay-Burmah trading company, India) is used for this technique. The monomer liquid is first dispensed in a dappen dish and the polymer powder can be taken in a rubber bowl.

4. Using a fine, nylon hair, brush (Faber Castell Aktiengesellschaft, Stein, Germany) is dipped in the monomer, the excess is gently allowed to run off by swiping the edge of the brush against the edge of the dappen dish. Round brushes work best, but the side of the flat brush can be used.
5. The monomer is then painted on to the external surface of the impression at the future beading line **{Figure 2}**. If necessary, this line can be marked gently by using a permanent marker. However, the application of monomer may cause the marking to get smudged and
6. Once the line of monomer has been painted on, it can be gently dabbed into the bowl of polymer **{Figure 3}**. The monomer that was earlier painted on will perform two functions. The monomer film that was painted on will cause the polymer to adhere onto its surface. Instantaneously, it also causes it to polymerise in that region only.
7. The excess powder in the surrounding regions is only mildly adherent and can be easily wiped off with a piece of cotton, tissue or cloth {**Figure 4}**. Air blowing with a three way syringe is not recommended at this stage.
8. This process is repeated in sections around the entire impression. If needed blowing with a three way syringe is not recommended at this stage. another layer can be painted on over the first layer of resin to enhance the roughness of this layer. The impression is air blown after completion of all sections to remove any powder over the surface.
9. What results, is a narrow roughened bond of polymerised acrylic at the place where wax is to be attached **{Figure 5}**. Modelling, utility or beading wax cut to appropriate size can be used. In this case, we have used modelling wax (Hindustan Modelling Wax No2, The Hindustan dental products, Hyderabad, India), that was cut along its length to a width of 5mm and folded in half to obtain a double thickness strip of width 2.5mm. This ensures that the material is sufficiently flexible when softened but hardens to a rigid beading once it cools **{Figure 6}**. In the mandibular impression, the tongue space is created by cutting a trapezoidal piece of wax and sticking the narrow part at the sublingual region and the broader part posteriorly.
10. Once the beading has been adapted, the modelling wax/ boxing wax can be used to form the boxing **{Figure 7, 8}**. Water can be poured into the boxing to check for a water tight seal.

    Once the boxing is done, the cast can be poured by using the gypsum product of choice.

Figure 1: The impression to be beaded was made using all green technique with a light body wash.

Figure 2: Painting the monomer on to the external surface of impression over the bead line

Figure 3: Dabbing / Dusting the monomer with polymer powder to allow it to stick on and polymerise

Figure 4: Wiping off excess polymer powder with a piece of cotton or gauze

Figure 5: A layer of roughened, polymerised acrylic is formed at the future bead line

Figure 6: Beading over the acrylic using wax strips

Figure 7: Completed beading with tongue space

Figure 8: Completed beading and boxing.

Discussion

A new method for the beading and boxing of elastomeric impression materials has been described. This method results in an excellent bonding between the beading and the impression material. Not much in literature has been described about the beading and boxing of denture impression made from the elastomeric impression despite their widespread popularity in making of impressions.

There are many suggested advantages to this method. This technique can be performed with much more rapidity than the plaster-pumice method or its modifications. It is also much cleaner, overall, to perform. It relies only on basic materials available in every dental office or laboratory. The materials used are ones that all operators have used in daily practice and hence offers great confidence to use.

There are few disadvantages to this technique. Some operators facing hypersensitivity to autopolymerising resin may not prefer this method. If the bead line happens to placed wrong, and the resin has already set, some

degree of effort is required to strip the layer of polymerised resin and this may damage the impression. There has been no attempt to evaluate if the direct application of monomer and the subsequent polymerisation cause any change to the impression material surface although no such change was visible to the naked eye.

Conclusion

The resin paint on technique offers a new and simple method for the beading and boxing of elastomeric impression materials. It offers multiple advantages such as good bond, easily learnable technique that uses familiar materials, cost efficiency and so on. The disadvantages are few. The beading and boxing of elastomeric impression is usually harder to do compared to a zinc oxide eugenol impression. This has perhaps been the reason for its declining use in clinical practice, However, the step is of vital importance. We hope that this new technique serves as a quick, effective method for the beading and boxing of elastomeric impressions.

Authors' contribution

Kiran Ram K: Conecpt, Design, Data Collection, Manuscript Writing, Final review

Shakila R: Concept, Design, Data Collection, Manuscript Writing, Final review

Ranukumari A: Design, Literature Search, Data Collection, Manuscript Writing, Final Review

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Conflict of interest

The authors have nothing to disclose or any conflicts of interest.

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