Review Article

Putty-Wash Techniques for Polyvinyl Siloxane Impressions: A Review

Mohsin A. Quazi, Krishnakumar S. Lahoti, Jaykumar R. Gade

Department of Prosthodontics, Swargiya Dadasaheb Kalmegh Smruti Dental College & Hospital

Corresponding Author:

Dr. Mohsin A. Quazi

Plot No.44, NewJagruti Colony

Katol Road Nagpur,

Maharashtra,

India- 440013

Email:dr.mohsinquazi@gmail.com

Received: 24-04-2014

Revised: 06-05-2014

Accepted: 09-05-2014

Abstract

Polyvinyl siloxane impression materials have applications in a variety of indirect procedures in prosthodontics and restorative dentistry. Their superior properties to other materials in almost all respect have made them most popular among elastomeric impression materials.However lack of the knowledge about the various techniques for making impressions with polyvinyl siloxane will lead to failure in impression making. An electronic search was performed using pubmed and science-direct to derive suitable literature regarding various techniques and compilation was done. In this review, different techniques and their clinical implications have been described which would surely help the clinician to improve the art of making accurate wash impressions.

Key Words: Elastomeric Impression materials, Polyvinyl Siloxane, Putty-Wash Impressions.

This article may be cited as: Quazi MA, Lahoti KS, JaykumarR. Gade. Putty-Wash Techniques for Polyvinyl Siloxane Impressions: A Review. J Adv Med Dent Scie 2014;2(2):62-66.

Introduction:

Impression making is an inevitable part of fabricating an indirect restoration. Most dentists have experienced the results of making a poor impression. Out of the four basic types of elastomeric impression materials the Polyvinyl siloxane (PVS) (Addition Silicone) impression materials has become the most widely used impression material in restorative dentistry.[1] PVS impression materials are in use since the mid-1970s and has garnered the lion's share in impressions of Fixed restorations. The advantages being able to best reproduce fine details and high elastic recovery. Available in various viscosities, rigidities, working and setting times, it can be used in a variety of clinical situations. The setting reaction has no by-product, so it possesses remarkable dimensional stability and is odorless, tasteless and pleasant for patients. The only disadvantage of PVS is the significant interaction with latex (gloves and rubber dam)[2] leading to inhibition of polymerization which is thought to result from contamination of the chloroplatinic acid catalyst of the PVS material with unreacted sulfur present in natural latex gloves. There are specific manipulative

variables that are important to achieving maximum performance with PVS impression materials. Some authors claim that impression materials have improved to such an extent that accuracy may be controlled more with technique than by the material itself. Hence it is essential for a clinician to have adequate knowledge of the various techniques that have been proposed in order to improve the accuracy and best suit the clinical condition and variations. The literature on the techniques for Elastomeric Impression materials was sorted by an electronic search using pubmed and science-direct. The compilation of the relevant information was done with the aim of reviewing the various techniques of making wash impression with Poly-Vinyl Siloxane impression material and providing thorough knowledge to the clinician.

Classification of Putty Wash Impression Techniques:[3] (Table : 1)

1. One Step Technique
    - Squash Technique
    - Simplified custom technique
    - Matrix impression system
    - Modified one step putty wash without spacer
    - Grinding the impression surface of putty material with Spacer
        -Polyethylene sheet
        -Prefabricated spacer
2. Modified two step putty wash

One Step Technique

Squash Technique (Single Step Dual Viscosity):

A stock tray is loaded with putty material, and the syringe material is injected around the prepared teeth. The tray containing the putty material is squashed over the syringe material, and the impression is made with the putty material and the syringe material setting simultaneously. The problem with this technique is to control of the thickness of impression material and it is unpredictable as to which material will record the prepared teeth. It has been reported that most of the time the putty displaces the light body and portions of the prepared margin are captured in the putty which is essentially deficient in its ability to record marginal details.[4]

Simplified Custom Impression Technique:

A vacuum 0.20-inch-thick, clear Template is made on the diagnostic cast and cut at the interproximal junction of the tooth to be prepared, leaving 3mm of matrix beyond the cervical finish line on the buccal and lingual surfaces, for correct seating. The wash material is syringed over the prepared tooth and template loaded with heavy body material is seated over it. This is followed by a pickup impression made in putty in a stock tray.[5]

The Matrix Impression Technique:

Gus J. Livaditis[6] suggested fabrication of a matrix with a semi rigid elastomer in a carrier so as to push it in sulcus and record it (Figure 1).

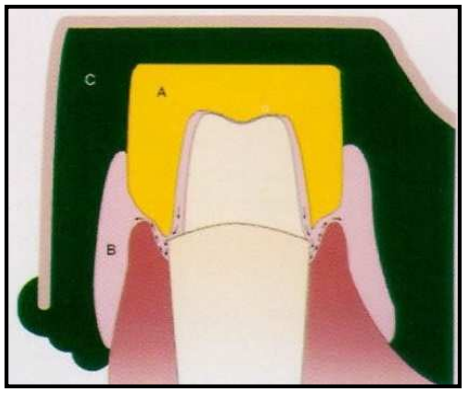

Figure 1: (A) Matrix impression material (B) extrudes out displacing air and fluid contaminants from sulcus. Medium body impression material (C) picks up matrix and also registers remaining natural teeth.

This matrix is refined and trimmed from the interdental embrasures and axial surfaces of the prepared teeth (Figure 2) to create space for the wash impression material to flow in the gingival crevice and record the margins accurately.

Figure 2: Facial and palatal sides of matrix are trimmed. Matrix should extend one half to two thirds of tooth beyond prepared teeth and close to gingival crest. Black lines indicate sulcular extension.

Occlusal surface of the matrix is spared to act as the stop for the matrix .The matrix is washed with a low viscosity elastomer so that it records the sulcus and margins properly (Figure 3).

Figure 3: Axial walls and positive vertical stops make proper seating easily discernible. Stock tray filled with medium viscosity impression material is seated over matrix impression before matrix material polymerizes.

This is followed by making a pick up impression with a Medium viscosity elastomer. (Figure 4) It is well suited for situations where multiple preparations are to be recorded. This technique is tedious and cumbersome but when used properly can give excellent results.

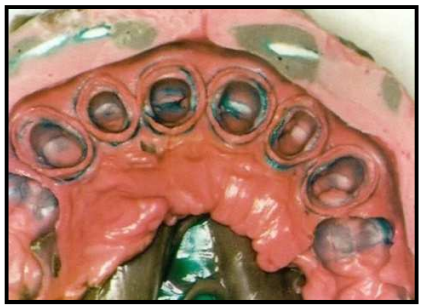

Figure 4: Completed impression shows accurate registration of preparation margins.

Modified One Step Putty Wash Impression Technique:

Aaron Yu-Jen Wu and Terry E. Donovan [7] suggested using clear ethyl vinyl acetate spacer formed by vacuum forming machine to control the wash bulk and minimize the chance of unfavorable impression results. The spacer is inserted in mouth followed by putty loaded in a stock tray which is removed before polymerization, the spacer is removed and the putty is washed with a light body impression material.

Two Step Techniques: (Two stage putty Wash Technique/ (Reline Technique)

The thick putty material is placed in a stock tray and Preliminary impression is made. This results in a custom tray of the putty. The space for light body or syringe material is created by either removing a layer of putty or by using a spacer to create space in the putty tray. The various two stage techniques are as follows.

Two stage putty Wash Technique (Without Spacer):

One of the approaches is to use a relieved putty impression. In this technique, a pre-operative putty impression is made intra-orally. Plastic sheets may be placed over the teeth to prevent material from enter in

gingival embrasures. In the area where the teeth are to be prepared, a layer of putty is removed with a bur or scalpel to provide relief, and the impression is ‘‘washed’’ or relined with low-viscosity PVS impression material.[8]

This approach can be successful, but there are two potential pitfalls. It is difficult to confine the wash materials to the area of the relieved impression, and some wash material enters the unrelieved impression. This results in an inaccurate occlusal pattern for the resultant cast. Thus, the entire impression, rather than just the relieved area, should be washed. This creates the potential problem of hydraulic distortion of the putty material as the impression is seated in the mouth. This is impossible to detect on a clinical level but may have a deleterious effect on the accuracy of the impression and resulting restoration.

Two stage putty Wash Technique (With Spacer):

The arbitrary trimming of the putty creates a non-uniform space for the light body. Therefore concept of spacer can be used to provide required space. The types of spacers include a polyethylene spacer [9], a prefabricated spacer made by a manufacturer or the clinician.

Using polyethylene sheet carries the risk of getting folded. Providing an accurate, uniform thickness of the wax spacer is critical to the improved accuracy of an impression made in a custom tray. The uniform spacer thickness of 2mm is considered to be optimal. Control of the thickness of the wax spacer is not easy, and the resultant impression may not provide the accuracy desired. All these short-comings can be overcome by use of clear ethyl vinyl acetate sheet as a spacer. The idea is to fabricate a template with vinyl acetate sheet over diagnostic cast. This template is inserted into patient’s mouth and putty impression is made. The template provides a uniform space for the light body with which final impression is recorded.

Modified Two Step Putty Wash:

The putty is loaded in a stock tray and inserted in the patient’s mouth to reach to a rubbery stage, but not completely polymerized, and is washed by using extra-light or light-body impression material with the pre-polymerized putty impression material in the tray. The wash impression material serves two main objectives (1) obtain the detail of the prepared abutment tooth and adjacent teeth, and (2) compensate for deformation that occurs when the pre-polymerized putty impression material is removed from the mouth.[10]

It reduces the time factor and gives good results. It requires excellent co-ordination between operator and assistant and poses problem when multiple tooth preparations are to be recorded.

Summary & Conclusion:

Dentists have a plethora of impression materials and techniques to use in the fabrication of tooth and implant-supported restorations. Obtaining maximum accuracy of impressions is critical to the provision of precise restorative dentistry. A number of studies suggest that the quality of impressions sent to commercial laboratories, seems to fall far short of the level of quality achievable by current impression materials. Thorough knowledge of contemporary principles of impression making and achieving those in our day to day practice is the need of the hour. The various ‘‘speciality’’ impression techniques described in the present article is bound to take the clinicians ability for making sounds restorations to a new height.

References:

1. Chee WWL, Donovan TE. Polyvinyl siloxane impression materials: a review of properties and techniques. J Prosthet Dent 1992;68:728.
2. Neissen LC, et al. Effect of latex gloves on setting time of polyvinylsiloxane putty impression material. J Prosthet Dent 1986;55:128–9.
3. Chaimattayompol N, Park D. A modified putty-wash vinyl polysiloxane impression technique for fixed prosthodontics. J Prosthet Dent 2007;98:483-5.
4. Chee WWL, Donovan TE. Fine detail reproduction of very high viscosity polyvinyl siloxane impression materials. Int J Prosthodont 1989;2:368
5. Sadowsky SJ. A simplified custom impression technique- J Prosthet Dent 2005;94:468-9.
6. Livaditis GJ. The matrix impression system for fixed prosthodontics- J Prosthet Dent 1998;79:208-16.
7. Yu-Jen Wu A, Donovan TE. A modified one-step put ty-wash impression technique. J Prosthet Dent 2007;98:245-246.
8. Donovan TE, Chee WL. A review of contemporary impressionmaterials and techniques. Dent Clin N Am 2004; 48: 445–470.
9. Wassell RW, Barker D, Walls AW. Crowns and other extra-coronal restorations: Impression materials and technique. Br Dent J 2002;192:679-90.

Source of support: Nil

Conflict of interest: None declared