Original Article

International Journal of Dental and Health Sciences
Volume 04,Issue 03

EVALUATION OF QUALITY OF FIXED PARTIAL DENTURE IMPRESSIONS MADE BY DENTAL UNDERGRADUATES

R. Sandhya[1]
1. Under Graduate Student, Saveetha Dental College and Hospital, Chennai

ABSTRACT:

The study is done to evaluate the quality of impressions made by dental undergraduates for fabrication of fixed dental prosthesis by describing the frequency of clinically detectable errors and also to analyse and correlate the various factors involved.

Making final impression for fixed dental prosthesis after chord packing has become a routine practice in the dental curriculum of undergraduates. Providing the dental laboratory with an accurate replication of the hard and soft tissue of a patient is important. An accurate impression produces the stone casts with minimal dimensional change in regard to the vertical and horizontal dimension between the prepared abutments. Clinical success of fixed prosthodontic procedure is dependent upon the dimensional accuracy of elastomeric impression material and impression procedures. Therefore, it is essential to examine whether clinicians critically evaluate impressions routinely before sending them to the laboratory. This study focuses on the errors in impressions taken for fixed partial denture construction and discusses the possible causes of the errors detected.

Keywords: Impressions, Fixed Partial Denture, Criteria for evaluation

INTRODUCTION:

Dental impressions play a vital role in fabrication of dentures and crowns. Hence it is very essential to record a impression that has minimal errors. The impressions recorded by dental undergraduates are evaluated in this study to dentify the common errors in the impressions and the possible cause for such errors are discussed. By thorough understanding of the errors in impressions and their possible causes, the quality of dental impressions can be improvised, resulting in better quality of dentures and crowns.

MATERIALS AND METHODS:

50 fixed partial denture impressions made by undergraduates of Saveetha Dental College were evaluated. These 50 impressions were randomised samples. All impressions were made in an controlled clinical setting.

Soft tissue retraction was achieved by using retraction cord. Double cord packing method was adopted. The materials used for recording the impression was putty and light body. The method of recording the impression was standardised. The impressions made were for single unit bridge.

The criteria considered for evaluation of the impressions were:

1. Tears at finish line.

2. Putty exposure through wash.

*Corresponding Author Address: Dr. R. Sandhya. E-mail: sandhya.jayanthi93@gmail.com

3. Air bubbles at the finish line.

4. Tray exposure.

5. Inadequate retention of material to tray.

6. Improper or non-uniform flash.

The errors taken as criteria for evaluation were tabulated and errors in each impression was noted. With this data, the percentage of each error amongst a total of 50 impressions.

RESULTS:

Among the 50 impressions that were evaluated, 27 impressions had non-uniform flash; 25 impressions had air bubbles; 16 impressions had putty exposure through wash; 14 impressions had tray exposure; 12 impressions had tears at finish line and 8 impressions had inadequate retention of material to tray. Out of the total number of impressions evaluated, 74% of impressions had more than one error.

Based on the data collected, the percentage of errors were calculated.

Tears at finish line - 24%

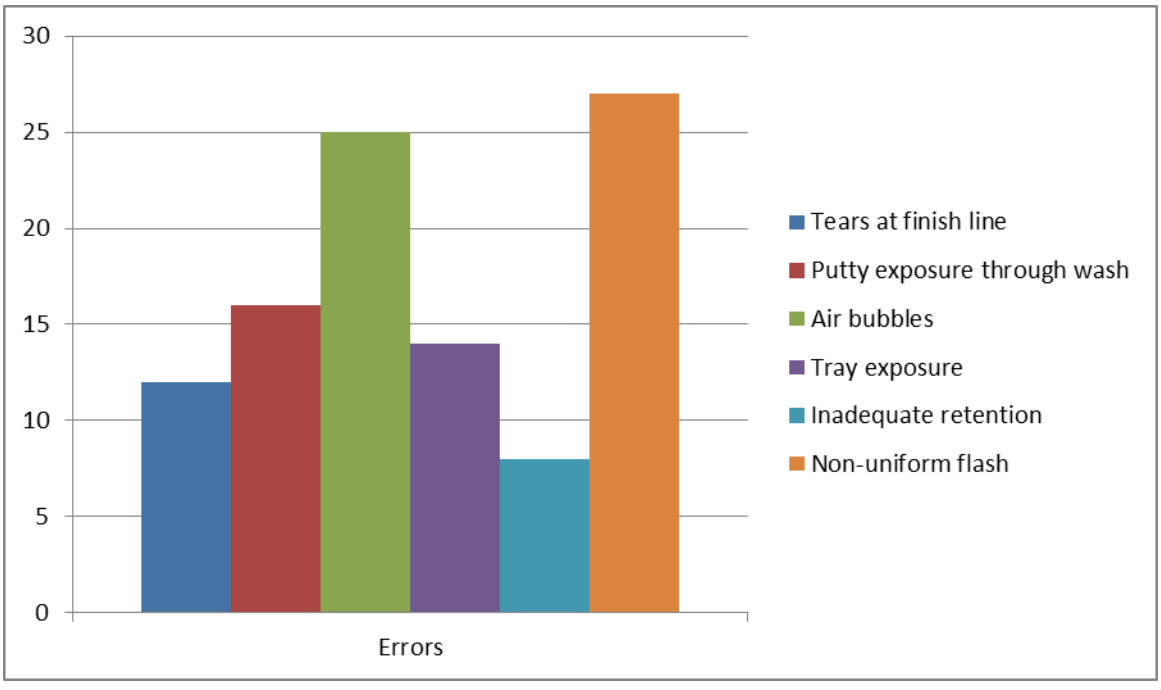
Putty exposure through wash - 32%

Air bubbles - 50%

Tray exposure - 28%

Inadequate retention - 16%

Non-uniform flash - 54%



DISCUSSION:

The study includes impressions taken by undergraduate students from different year of study. Around 74% of the cases had more than one observable errors which is similar to the results of a study done on fixed partial denture

impressions. [5] The most common error was non-uniform flash which was found in 54% of cases. In the putty/wash technique, an accurate impression can best be achieved if sufficient force is exerted on the wash material. If not, it results in improper or non-uniform flash.

Tear resistance indicates the ability of a material to withstand tearing in thin interproximal areas and in the depth of the gingival sulcus. [1] There was absence of tears in the impression which might be due to the good tear resistant nature of material. [2,3] Most addition silicone materials provide higher tear strengths than polyether and hybrid materials. [4]

Air bubbles in impressions form either as a result of mixing, tray loading, syringing or tray seating. Compared with spatulation, syringe mix systems significantly reduce incorporated bubbles but are not foolproof. [6] Prior to placing the mixing nozzle, a small amount of material should be extruded from the cartridge to ensure no blockage present. Air can easily be trapped at the gingival sulcus as the syringe tip circumnavigates the tooth.

Detachment of the impression from the tray can result in gross distortion of the cast. It may occur on removal from the mouth and may often go unnoticed. Prevention of detachment relies on the proper use of adhesive and having a tray with adequate perforations. [7] It is a good idea to select the tray and apply adhesive before the tooth is prepared. Doing so will allow time for the adhesive's solvent to evaporate and for adequate bond strength to develop. [8]

The impression tray contacts the tooth preparations in cases of incorrect tray size or shape, insufficient impression material in the tray, if dentition is not aligned with the tray when seating, adopting improper technique or when using excessive force. Thus it results in tray exposure.

CONCLUSION:

Of the impressions, 74% had more than 1 observable errors. The most common error was Improper or non-uniform flash (54%). These errors may be due to difficulties in obtaining an intimate contact between the impression material and the tooth in an area in which biological fluids and air are present, faulty manipulation of the impression material while placing it around the prepared tooth, or premature removal of the impressions from the mouth.

REFERENCES:

1. Lu H, Nguyen B, Powers JM. Mechanical properties of 3 hydrophilic addition silicone and polyether elastomeric impression materials. The Journal of prosthetic dentistry.

2. Giordano R, 2nd. Impression materials: basic properties. General dentistry.
3. Craig RG RG. Restorative dental materials. 11th ed: Elsevier; 2002.
4. Lawson NC, Burgess JO, Litaker M. Tear strength of five elastomeric impression materials at two setting times and two tearing rates. Journal of esthetic and restorative dentistry : official publication of the American Academy of Esthetic Dentistry [et al].
5. A clinical evaluation of fixed partial denture impressions Nachum Samet, DMD, Michal Shohat, DMD, Alon Livny, DMD, Ervin I. Weiss, DMD Harvard School of Dental Medicine, Boston, Mass; Hadassah–Hebrew University School of Dental Medicine, Jerusalem, Israel.
6. Chong YH, Soh G, Lim KC, Teo CS. Porosities in five automixed addition silicone elastomers. Operative Dent 1991.
7. MacSween R. Peel bond strengths of five impression material tray adhesives. J Can Dent Assoc 1991.
8. Davis GB, Moser JB, Brinsden GI. The bonding properties of elastomer tray adhesives. J Prosthet Dent 1976.