

IMPRESSION MATERIALS AND TECHNIQUES USED FOR COMPLETE DENTURE FABRICATION AMONGST GENERAL PRACTITIONERS- A SURVEY IN AND AROUND CHENGALPET DISTRICT

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ABSTRACT

Aim: The aim of this article is to conduct a survey using a questionnaire on the various impression materials and methods for complete denture fabrication amongst general practitioners in and around Chengalpet district.

Materials and Methods: A survey questionnaire was prepared and distributed randomly to 50 practitioners in Chengalpet district irrespective of their field of specialization. The survey included a set of 11 questions regarding the choice of impression materials and techniques for complete denture fabrication. From the list of possible responses, each respondent was only permitted to select one.

Result: Irreversible hydrocolloid was the most commonly used material for primary \

impressions. When creating the impressions, the majority of practitioners used the selective pressure hypothesis. A spacer covering only the secondary stress-bearing and relief zones was employed by the majority of practitioners. Most dentists determined the spacer thickness based on the degree of relief. A spacer was used along with light body polyvinylsiloxane impression material by the majority. The preferred material for border moulding the custom tray is green stick compound. Eugenol pastes have been replaced by polyvinylsiloxane as the material used to create final imprints. By creating relief holes, excessive moveable tissue is taken into account. The selection of material was not substantially impacted by the material cost.

Keywords: Impression materials,

Technique, spacer design

INTRODUCTION

To achieve a good retention and peripheral seal, as well as to offer stability and support for the entire denture, a perfect impression method is required [1,2]. The defined boundaries of the final impression should ideally resemble denture flanges in terms of thickness and length [1,3]. In order to ensure a successful complete denture, adhere to the specified progressive steps [3,6,5]. These include primary impression, custom tray fabrication, border molding, and final impression. With the development of new materials and techniques, impression-making techniques have evolved, and today. For various therapeutic scenarios that require a thorough comprehension of impression concepts and principles, a variety of resources and methods are accessible. Despite the advancements, material selection typically depends on expertise and personal preference.

This study sought to determine the impression material and manufacturing technique choices used by general practitioners, including prosthodontists, in the Chengalpet district.

Materials and methods

A questionnaire for the survey was created and distributed to the general practitioners including the Prosthodontist in chengalpet district. The survey comprised of two sections. In the first section, focus was on the type of impression material used during the primary and secondary impressions which include elastic and inelastic impression materials. The second section focused on techniques employed in fabrication of final impression and the spacer designs that will be used in final impression procedures. The

questionnaire was prepared based on the survey which included 11 multiple choice questions which was circulated to the respondents. Every respondent were allowed to choose only one option for each question. The response from the respondents were kept confidential throughout the survey. The results were calculated based on the response received and it was converted to percentage distribution.

RESULTS

It was ensured that all 50 questionnaires were filled with no question left unanswered. (The article has rounded all percentages to the closest whole number). Concerning the selection of materials utilised to create initial impressions, 30 respondents (60%) indicated the use of irreversible hydrocolloid (alginate) and 20 (40%) still preferred using impression compound (figure1). 27 respondents (54%) use selective pressure technique while making the final impression, while 17 of them (34%) use the conventional method and 6 respondents (12%) use the mucocompressive or functional method (figure2). A majority of the practitioners 46(92%), utilised a spacer in the custom tray design and the rest did not use a spacer (figure3). Among the ones that use a spacer, 29 of them (58%) cover just the secondary stress-bearing and stress-relieving locations with a spacer, 11 respondents (22%) use full spacer not covering the major stress areas with additional relief if required and 10 of them (20%) use a complete spacer with extra relief and tissue stops (figure 4). Based on the degree of relief, 23 (46%) responders determined the spacer thickness. 20 of them (40%) decided it arbitrarily whereas 7 of them (14%) connected the type of impression material used with the spacer thickness (figure 5). A majority of the respondents 35(70%), use a spacer along with light body addition silicone while the rest of them,

15(30%) do not use it (figure 6). It was found that the majority of responders border-molded the custom tray before leaving their final impression, it was discovered. 39 respondents (78%) use modelling plastic impression compound or green stick compound for border molding, 8 of them (16%) use wax materials and 5 of them (10%) use polyether (figure 7). About the material that is utilised to create secondary impression, 26 respondents (52%) used polyvinylsiloxane, 15 respondents (30%) used irreversible hydrocolloid (alginate) and 9 of them (18%) used zinc oxide eugenol paste (figure8). Majority of the respondents 40 (80%) gave special consideration for excessively movable tissue (figure9). 22 of them (44%) made relief holes in the custom tray, 14 of them (28%) used a spacer on the cast, 8 respondents (16%) selectively reduced the custom tray and 6 of them (12%) used modified impression techniques like window technique (figure 10). The selection of impression material appeared to be influenced by the material cost for 24 respondents (48%) (figure11).

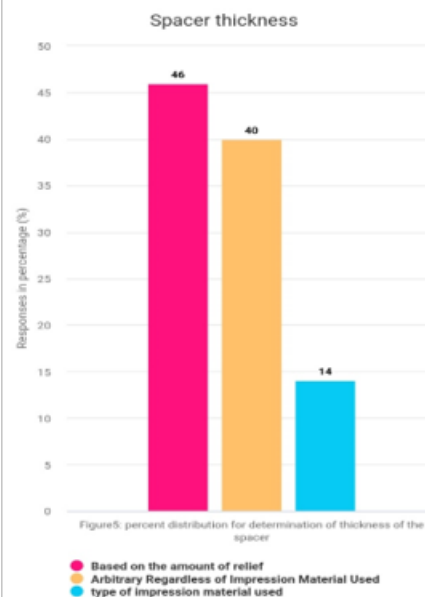
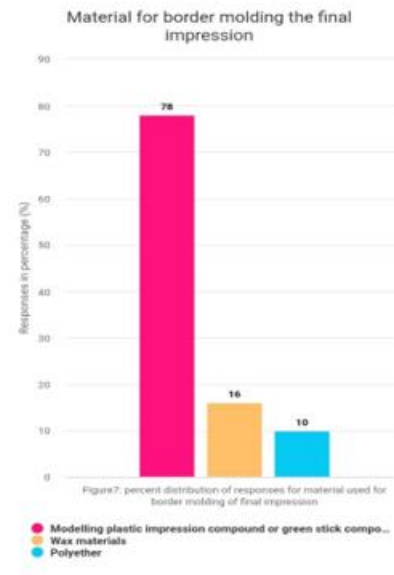
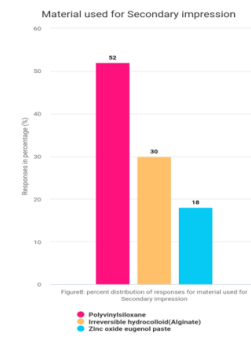
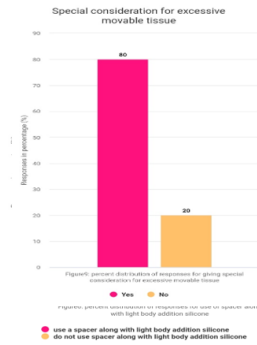
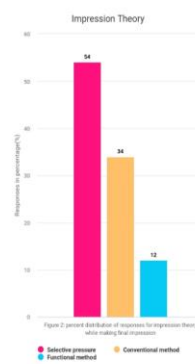
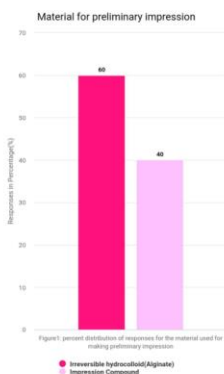


Figure 11: percent distribution of responses for influence of cost of material on choice



DISCUSSION

The Dental Surgeons participating in the survey correspond to different specialities and performed impression making as a part of their treatment plan at some point or another. With differing period of experience, the dentists were able to give their personal opinion regarding each and every question, thus providing better awareness into the subject.

In this survey, the most often utilised primary impression material was irreversible hydrocolloid (60%), impression compound being used only by 40% of the respondents. This is in confirmation of the survey conducted by Rupal *et al* [7] and Kakatkar[8] where they described that impression compound was used by maximum of the practitioners in India. Although a study conducted by Singh G *et al* [9] in four major Indian cities revealed that alginate was used by 71% of the practitioners. Surveys conducted in United Kingdom[10] and U.S Dental schools[11] have also reported the preferred substance for creating primary impressions is alginate.

Most of the practitioners (54%) used selectively pressure technique for making the final impression followed by 34% of the respondents using the conventional method.

This is in agreement with previous surveys conducted in India and other countries [7,12,13]. By using a selective pressure approach, the non-stress carrying portions are relieved and the pressures are limited to the stress bearing areas.

In this survey, 92% of the respondents suggest using a spacer when designing a custom tray and Most people utilise a spacer that only covers the secondary stress-bearing and relieving zones (58%). Previous surveys conducted to analyse the design of spacer used have also shown same results.

Respondents were also asked the criteria used to decide the thickness of the spacer. Most of them (46%) decided the thickness based on the amount of relief, the rest made the decision arbitrarily (40%) or based on the choice of impression material (14%). According to a survey of dental colleges in the United States, the majority (45%) applied a coating of base plate wax for relief [12]. A. Roy Macgregor recommends the following thicknesses of the spacer based on the impression material used: 2.5mm for impression plaster, 0.5 mm for zinc-oxide eugenol paste, 2mm for alginate and 1.3-3mm for elastomeric impression materials [14].

66% of the respondents used a spacer when using light body addition silicone as the impression material of choice. This is in agreement with the fact that some amount of tissue compression occurs when using elastomeric impression materials [15].

The most widely used material (78%) is modelling plastic impression compound because of its affordability, dimensional stability, minimal material waste, extended shelf life, ease of adaption, and capacity to be added in increments. According to U.S. school surveys, elastomeric materials are

increasingly being used for border moulding [16]. Elastomeric impression materials have the advantage of being quicker and allowing for simultaneous recording of all boundaries.

A clear majority (52%) use polyvinylsiloxane as the material of choice for making the final impression. In contrast, zinc-oxide eugenol pastes were more frequently used in earlier surveys carried out in India [7,8]. Benefits of using elastomeric impression materials like PVS and polysulfides is their dimensional stability, ease of handling and manipulation, sufficient working and setting time, and enhancement of general qualities. The main disadvantage of Zinc-Oxide Eugenol pastes is that it is inelastic, adheres to the skin and mucosa, and burns.

Eighty percent of respondents gave special emphasis to excessively moveable flabby tissue, and the majority (44%) preferred to put relief holes. In contrast, the window technique, also known as the modified impression technique, was employed by the majority of respondents in a prior survey conducted by Mehra et al. [17].

The cost of material often influences the choice of impression material. 48% of the respondents considered the cost of the material before using a material. No significant correlation has been made between the cost of the material and choice of

- Most of the dentists used polyvinylsiloxane
- Most of practitioners followed the principles of mucostatic impression wherever excessively mobile tissues were found.

QUESTIONNAIRES

material in previous surveys.

CONCLUSION:

This study described the existing patterns among general practitioners in and around the Chengalpet district with reference to impression materials and complete denture fabrication techniques. The following conclusions can be made in light of the study's findings and constraints.

- For preliminary impressions, the majority of responders chose irreversible hydrocolloid impression material.
 - When making impressions, the majority of practitioners favoured the selective pressure theory.
 - The majority of practitioners merely cover the secondary stress-bearing and stress-relieving areas with a spacer.
 - Many practitioners used the degree of relief to determine the spacer thickness.
 - Most of the dentists used a spacer along with light body addition silicone.
 - Vast majority of practitioners selected low fusing modelling plastic for border molding the custom tray.
- as the material for making final impressions.
- The cost of the material does not significantly influence the choice of material.

1. What is the material of choice for making the preliminary impression?

- a) Impression Compound
- b) Irreversible Hydrocolloid (Alginate)
- c) Elastomeric Putty
- d) Other (Please Specify)

2. What impression theory you use for making the final impression?

- a) Mucostatic (Non-Pressure)
- b) Functional (Pressure)
- c) Selective Pressure
- d) Conventional

3. Do you use a spacer design in your custom tray?

- a) Yes
- b) No

4. If yes, which design of spacer is mostly used?

- a) Full Spacer with Tissue Stops and Additional Relief
- b) Full spacer not covering the Major Stress Areas with Additional Relief if Required
- c) Spacer covering only the Secondary Stress Bearing and Relief Areas
- d) Spacer in Special Circumstances only (as in cases of flabby tissue, undercut areas, high vault or prominent ridges and spicules)

5. How is the spacer thickness decided?

- a) Arbitrary Regardless of Impression Material Used

b) Based on the Choice of Impression Material

- c) Based on the Amount of Relief
- d) Other (Please Specify)

6. Do you use spacer with light body addition silicone?

- a) Yes
- b) No

7. Do the border molding procedure in the custom tray before making the final impression?

- a) Yes
- b) No

8. What material is used for border molding the final impression?

- a) Modeling Plastic Impression Compound (Green Stick)
- b) Wax
- c) Polyvinylsiloxane
- d) Polyether
- e) Other (Please Specify)

9. What is the final impression material of choice?

- a) Zinc Oxide Eugenol Paste
- b) Non- Eugenol Paste
- c) Polyvinylsiloxane
- d) Polysulphide
- e) Polyether
- f) Irreversible Hydrocolloid

g) Impression Plaster

h) Other (Please Specify)

10. Do you have any special consideration made for excessive movable tissue?

a) Yes

b) No

If yes, how is relief provided for flabby tissue?

a) Relief Holes in Custom Tray

b) Selective Reduction of Custom Tray

c) Spacer on the cast

d) Modified Impression Technique (e.g. a window technique in conjunction with plaster, methods using light bodied impression paste e.t.c).

11. Is the cost of the material a significant factor in influencing the choice of impression material used?

a) Yes

b) No

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