

Awareness and knowledge of various impression techniques for resorbed ridge in complete denture fabrication among dental students

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ABSTRACT:

Introduction:

Complete denture requires proper stability and retention for satisfactory results. In cases of resorbed ridges these two main properties are compromised. Complete denture fabrication of a resorbed mandibular ridge is more complicated when compared to that of maxilla. The need for recording the impression accurately is necessary for fabricating a good denture for resorbed ridges.

Aim:

The purpose of this survey was to determine the awareness of various impression techniques used for resorbed ridges for fabricating a complete denture among dental students in South Indian population.

Materials and methods:

A self-administrative questionnaire especially designed for this study, was distributed among 100 individuals. The questionnaire consisted of 10 questions.

Results:

The awareness on the various impression techniques used for resorbed ridge was very low(40%) among the dental students. The awareness of the different impression materials(20%) used for resorbed ridges was also not found to be satisfactory. A percentage of only 40 believed that it was possible to make a complete denture in highly resorbed ridge successfully.

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Conclusion:

A very poor response was found in the awareness of various impression techniques in highly resorbed ridges among dental students. An awareness can be created by giving short classes on how to manage highly resorbed ridges to increase the knowledge of dental students and to increase their confidence on managing patients with highly resorbed ridges.

Keywords: Awareness, students, resorbed ridges

I. INTRODUCTION

Complete dentures are replacement of completely edentulous arch which takes the support of the tissues for retention. The original conditions of the oral cavity are restored with complete dentures(1). Complete dentures are mechanical devices that are designed in a way to harmonise with the normal neuromuscular system as they have to function in the oral cavity(2). The complete denture aims at providing a functionally aesthetic substitute and replacing the structures associated in the oral cavity(3). In older adults, the complete loss of teeth requires the need for replacement for mastication, speech and aesthetic reasons which is achieved by designing a denture bearing all the teeth and replicating the functions of the oral cavity. There have been evidences of harmful effects on the tissues supported by denture during the use of complete dentures (4). Resorption of the ridge is seen in an adverse manner in the first year of tooth loss with a decrease in the rate of resorption progressively in the proceeding years(5,6). The fabrication of complete denture becomes difficult as the ridge resorption continues since it has a direct effect on the retention of the denture. One of the biggest difficulty encountered is the fabrication of a complete denture in a resorbed mandibular ridge. Fabricating a complete denture in an atrophic residual ridges are the most common problem encountered among general dental practitioners and prosthodontists(7). Mandibular dentures face these problems more when compared to maxillary dentures as it is difficult to achieve retention and stability in the mandible(8). There are differences in the anatomical structures and primary and secondary load bearing areas of the maxilla and the mandible hence giving special attention to the resorbed mandibular ridges while making impressions(9). As the residual ridge resorb, the conventional technique using zinc oxide eugenol or elastomeric impression materials become difficult to record the details of the impression and hence have a direct effect on the retention and stability of the denture.

However various impression techniques have been introduced to overcome this problem such as all green impression technique, cocktail impression technique, elastomeric impression technique and functional technique.

These techniques differ in the use of impression materials to aid in the various shortcomings encountered with conventional technique such as maximum coverage can be attained as they can be easily controlled, they can be corrected with time, the extent of the mucobuccal reflection can be accurately detected and the load bearing areas like the buccal shelf areas and the slopes of the alveolar ridge can be under direct pressure(10). These techniques differ in the secondary impression technique.

In all green technique, the green stick compound is moulded in a homogenous mass and the impression is taken with all the border movements being performed followed by impression with zinc oxide eugenol(11).

In cocktail impression technique(12), autopolymerizing acrylic resin was used to fabricate a customised tray. The tray was designed with a 1mm spacer wax and two mandibular rests on either sides of the tray which were cylindrical and placed posteriorly with the increased vertical height and concavity on the lingual side to allow movements of the tongue. On biting, the maxillary alveolar ridge sits on the mandibular rests helping the tray to stabilise anteroposteriorly and mediolaterally during definitive impression. The functional state is recorded by asking the patient to run his tongue along his lips, pulling his lips, sucking his cheeks and swallowing by keeping the mouth closed until the material is set.

The functional technique also known as closed mouth functional impression technique was introduced by Winkler(13) which used occlusal rims on the denture bases on primary casts followed by jaw relation. Patient was asked to do various functional movements like whistling, smiling, puffing and blowing post application of tissue conditioning material on the mandibular denture base and closing the mouth on the prerecorded vertical dimension. This process was repeated three times at an interval of 8-10 minutes and light body addition silicon was used to make the final impression with closed mouth technique.

In elastomeric technique as the name suggests, is taken with elastomeric impression materials. Tray adhesive is applied on the internal, external surface and borders of the special tray to aid in retention followed by border moulding with an addition silicon putty material of a greater working time. The impression is then followed by a light body addition silicon impression material and repeating the tongue movements to record the impression and removed after the material sets.

An other impression technique is the admixed impression technique(14), in which the impression compound and green stick compound were used in the ratio of 3:7 parts by weight and a homogenous mass was kneaded out of it by using 60 degree celsius temperature of water in a bowl. This mass is placed on the tray and patient is made to perform the different tongue movements.

II. MATERIALS AND METHOD

A sample of 100 dental students were included in the survey conducted among the South Indian population. A set of 10 questions were created and the questionnaire was distributed to 100 respondents. The questionnaire consisted of questions regarding the knowledge and awareness on various impression techniques used in resorbed mandibular ridges. The questionnaire response was collected and recorded. A comparison of answers from the collected data was made.

III. RESULTS

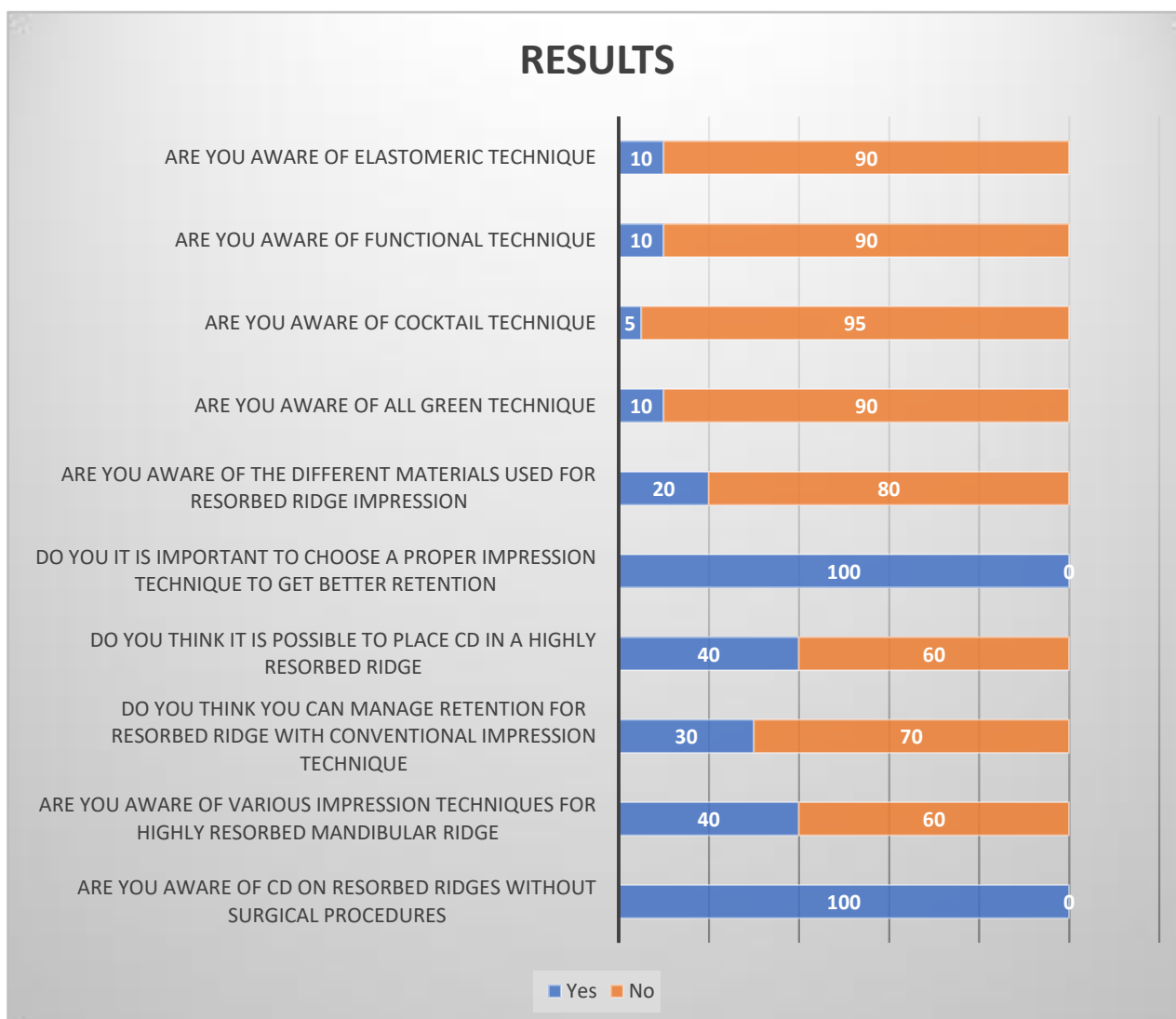
There was found to be 100% awareness on the fabrication of complete dentures on resorbed ridges without surgical treatment. However the awareness on various impression techniques was found to be only 40% with very less knowledge on the techniques like all green technique(10%), cocktail technique(5%), functional

technique(10%) and elastomeric technique(10%). Whereas only 40% were of the view that we can plan complete denture in a resorbed ridge and 30% believed that it was possible to manage the resorbed ridge in complete dentures using conventional technique. A minimal(20%)awareness on the various impression materials used for resorbed ridges was found.

TABLE 1: QUESTIONNAIRE

| QUESTIONS | YES(%) | NO(%) |
|---|--------|-------|
| Are you aware of CD on resorbed ridges without surgical procedures | 100 | 0 |
| Are you aware of various impression techniques for highly resorbed mandibular ridge | 40 | 60 |
| Do you think you can manage retention for resorbed ridge with conventional impression technique | 30 | 70 |
| Do you think it is possible to place CD in a highly resorbed ridge successfully | 40 | 60 |
| Do you it is important to choose a proper impression technique to get better retention | 100 | 0 |
| Are you aware of the different materials used for resorbed ridge impression | 20 | 80 |
| Are you aware of all green technique | 10 | 90 |
| Are you aware of cocktail technique | 5 | 95 |
| Are you aware of functional technique | 10 | 90 |
| Are you aware of elastomeric technique | 10 | 90 |

GRAPH 1 : GRAPHICAL REPRESENTATION OF THE RESPONSE



IV. DISCUSSION

Complete denture is a very common treatment plan for completely edentulous patients. Most of the time it is found that implant supported complete dentures are not preferred by some individuals hence the awareness and knowledge on various impression techniques to fabricate a satisfying denture is necessary in highly resorbed ridges. Our survey aimed at assessing the awareness and knowledge of dental students on impression techniques for resorbed ridges during fabrication of complete dentures. There are numerous impression techniques with its own pros and cons that have been described in the literature for resorbed ridges (9,15,16). In the present survey conducted, the awareness on the different impression techniques for resorbed ridges was very less ranging from 5%-10% only. However awareness was seen in the fabrication of complete dentures without surgical treatment but knowledge on the various named procedures was not found satisfactory. Also the awareness on different impression materials was very less.

There have been various studies done on the different impression techniques for resorbed ridges. In a study done to check the retention on a resorbed ridge using 6 different techniques showed that the functional impression technique showed the highest mean value of retention which was followed by elastomeric technique, all green and admixed techniques whereas the cocktail and greenstick techniques showed the least mean value(17). This study showed similarity to a study done by Drago which suggested that the impression techniques involving closed mouth technique showed better retention than the open mouth techniques(16). In an other study, the use of polyether impression material was described to use for border moulding as it can be completed in one step using the functional movements of the patient(18). In two surveys(19,20) conducted it was found that zinc oxide eugenol impression paste and modelling plastic impression compound was most preferred due to its ease of handling, ability to produce detailing in the impression, faster setting time and not much of significant dimensional changes post hardening.

V. CONCLUSION

In the survey conducted, it was found that there was awareness on the fabrication of complete dentures without the use of surgical treatments in highly resorbed ridges but there was very minimal awareness on the various impression techniques used to manage the resorbed ridge fabrication of complete dentures. There was also not good awareness and knowledge on the different impression materials used for the impression techniques in resorbed ridges. The basic knowledge on the fabrication of complete dentures in highly resorbed ridges is necessary to manage such cases.

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