

# CHOICE OF ALL CERAMIC RESTORATION FOR DISCOLOURED ANTERIOR TEETH

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## Abstract:

Restoring discolored anterior teeth poses a serious problem in achieving good esthetics when restored with all-ceramic crowns. Selecting the material of the restoration, shade, and communicating it to the dental technician presents an even bigger challenge. This survey is conducted to gather some information from dentists in order to understand their outlook on choice of materials and to evaluate the most preferable materials in fabricating a full ceramic restoration for the discolored anterior teeth. The survey questionnaire consisted of 20 questions aimed toward the current trend in fabricating a full ceramic restoration for discolored anterior teeth. This questionnaire was validated by a panel of senior prosthodontist and technicians and was sent to 70 dentists in Chennai and got 40 responses. The results of the study showed that 62.5% of the dentists preferred Ips emax lithium disilicate high translucency ingots for their cases. 31.3% dentists preferred high translucency ingots for their patients. 12.5% low translucency, 56.3% medium opacity ingots. 81.3% dentists preferred layering technique and 18.8% dentists preferred cut back techniques. 81.3% dentists use resin cement for their restoration. 12.5% use Glass ionomer cement. The dentists preferred lithium disilicate for their patients and this survey would help to improve the rapport between the clinicians and dental laboratories and optimize the esthetics of the restorations fabricated for anterior teeth. discolored teeth.

**Keywords:** Communication, Discolored teeth, Ingots, Lithium disilicate, shade election.

## I. INTRODUCTION

One of the areas not often spoken about is the communication between the dentist and the dental technician as a team. Each has a major role in indirect restorative dentistry, which is to replicate

natural function, esthetics, and transform that into a sound restoration. The combination of the clinical experience, skill, and treatment planning by the dentist along with the technical expertise, knowledge of the properties of materials, and the ability to

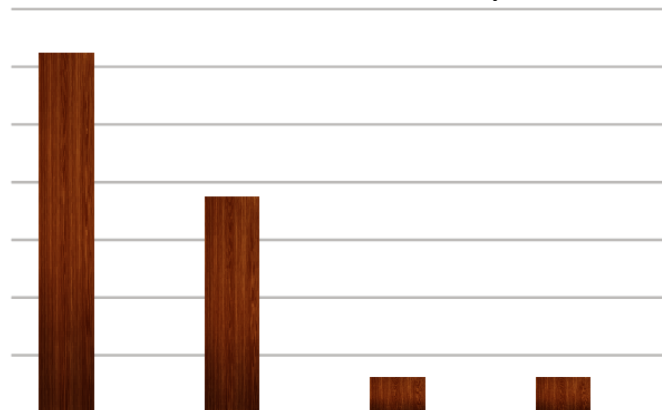
translate two-dimensional (2D) design diagrams and written instructions into the three-dimensional (3D) reality helps produce the best esthetic results (Fages, n.d.; Hanson, 2015). Restoring discolored anterior teeth poses a serious problem in achieving good esthetics when restored with all-ceramic crown. Selecting the material of the restoration, shade, and communicating it to the dental technician presents an even bigger challenge. (Chu et al., 2017) It is often difficult to communicate the various nuances of color to the technician with a single work order. The color replication process for dental porcelain comprises the shade selection phase followed by shade duplication. Shade selection is done by visual methods or by using modern technologies like colorimeters, spectrophotometers, and digital imaging systems (Sarmast et al., 2018). This information is then conveyed to the dental technician in a manner that would appropriately help them to replicate even the smallest details in order to fabricate an esthetically sound restoration. The communication between the clinician and technician entails a thorough transfer of information, including the shade selected, the stump shade, material to be used for fabrication, functional components, occlusal parameters, phonetics, and esthetics (Chen et al., 2012).

This survey is conducted to gather some information from dentists in order to understand their outlook on choice of materials and to evaluate the most preferable materials in fabricating a full ceramic restoration for the discolored anterior teeth.

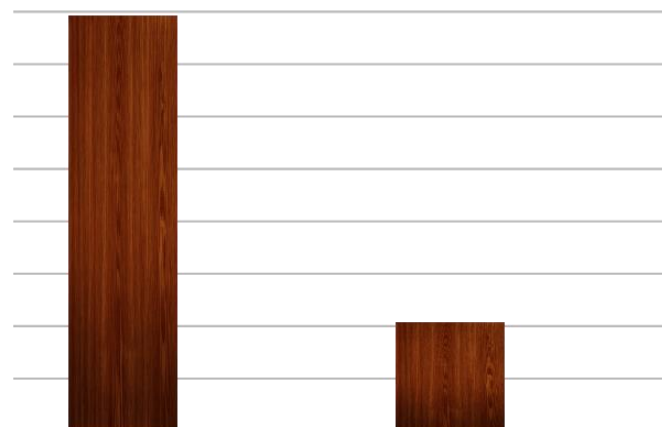
## II. MATERIALS AND METHODS

A survey was conducted among the dentists in Chennai about their choice of material for fabricating the all ceramic restorations. The survey questionnaire consisted of 20 questions aimed toward the current trend in fabricating a full ceramic

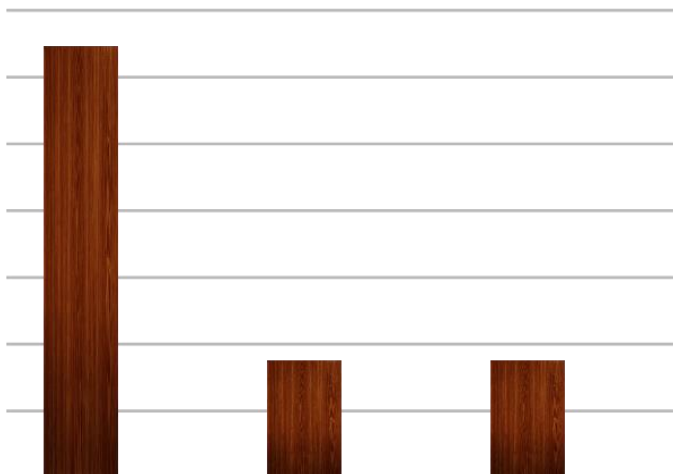
restoration for discolored anterior teeth. This questionnaire was validated by experts and was sent to 70 dentists in Chennai and we got 40 responses. This helps in understanding the material preferences by the dentists in fabrication of ceramic crowns, and then the results were analyzed.



**Fig 1: Material preference for anterior restoration**



**Fig 2: Technique preference for fabricating anterior restoration**



**Fig 3: The luting cement influence on shade of restoration**

### III. RESULTS AND DISCUSSION

After the survey was filled, it was discussed with dentists to understand their point of view for every question. This survey was carried out in Chennai. The results of this study shows that 62.5 percent preferred emax lithium dilsilicate for their cases, 37.5 percent preferred zirconia crowns, 6.3% preferred ips emax and 6.3 % emp2 (Fig 1), 79% of dentists preferred layering technique for the fabrication of the all ceramic crowns, only 20.8% preferred cut back technique (Fig 2). 47% dentists preferred high translucency ingots, 5.9% preferred low translucency ingots and 47% dentists preferred medium opacity for their cases. 64.7% dentists considered their shade of the cement also influencing their shade of the all ceramic restorations (Fig 3). 81.3% dentists use resin cement for their restoration. 12.5% use GIC of the restoration.

Berry et al had carried out a study in which the laboratory prescription and the telephone were the main communication tools used between the dentists and the dental technicians. The results of this study showed that dentists communicated through a written prescription with the dental technician. (Berry et al., 2014) Many clinicians send their cases without a picture, so there are limitations when trying to create the best shade match for the restorations. (Sulaiman & Adebayo, 2019) In the present survey,

The reasonable explanation to this could be that high-opacity ingot would make the restoration look highly opaque in the anterior esthetic zone and the low-translucency and high-translucency ingot would be unable to conceal the discoloration. So, the medium opacity ingot would create a visual harmony between the natural tooth and the restoration on the discolored tooth (Della Bona & Kelly, 2008).

Chadwick et al stated that try-in pastes available match the shades of the luting agents that are used to finally cement the restoration in place. It is essential to gain the approval of the patient before final cementation takes place. Such restorations should, therefore, be tried by using a try-in paste. This allows both the dentist and the patient to evaluate the shape, chroma, hue, value, and translucency of the restorations to ensure that all esthetic expectations can be matched. Based on the feedback from dental technicians, only 15.4% of their dentists used the try-in paste for selection of the final cement (Chadwick et al., 2008).

The stump shade should have been taken prior to layering in order to select the appropriate shade and translucency of the ingot. The stump shade is an extremely vital information which should be conveyed to the dental technician, especially where discolored teeth have to be restored and the discoloration has to be masked; but, in this survey, it was found that the majority of the dentists did not provide the stump shade to the dental technicians. Some of the dentists who provided this information used the VITA shade guide to convey the stump shade, but it is not an ideal shade guide for determining the shade of discolored teeth. There are special shade guides available, which help in estimating the stump shade of discolored teeth. Shade guides are not a perfect representation of what is actually seen, but are close enough to identify a range of tooth colors. Eyes are still the best tool for identifying and communicating the correct dental

shade.(Gomez Polo et al., 2019; Śmielecka & Dorocka-Bobkowska, 2020) It is always best to get the patient to the dental laboratory and have the shade taken, particularly for those cases where achieving esthetics is critical (Ismail et al., 2020; Xu, 2018).

#### IV. CONCLUSION

Through analysis of the observations in this survey and within the limitations of the study, the following conclusions can be drawn, Majority of the dentists preferred using lithium disilicate material IPS e.max and its medium opacity ingots to fabricate restorations by layering technique for masking discolored anterior teeth. Majority of the dentists preferred using resin cement for luting all ceramic restorations.

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