KNOWLEDGE ATTITUDE AND PRACTICE ON THE USE OF TEMPLATE TECHNIQUE FOR RESTORING ESTHETICS IN FRACTURED ANTERIOR TOOTH: A SURVEY

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Abstract: **Introduction**: A thorough discipline is required for accurate placement of predictable esthetic restorations on anterior teeth which can result in unnecessary provision of an indirect restoration if correct protocols are not followed. Template technique can be proven to be easy for inexperienced beginner clinicians without requiring special skills in providing the patients with direct composite restoration. **Aim**: The aim of this study was to create awareness on the template technique in restoring esthetics in fractured anterior teeth. **Materials and method:** A well structured questionnaire was prepared consisting of 17 questions among dental students. The results were analysed using SPSS software version 23. **Result and discussion:** The data was subjected to descriptive statistics using SPSS software version 22. Each question of the survey was represented by a pie chart. The p value was 0.0015 when tabulated statistically in SPSS software.The template technique method is simple, quick and economic when compared to other invasive procedures. **Conclusion**: The survey conducted among dental students has shown that the students of dental school showed a moderate awareness on the use of template technique for restoring fractured anterior teeth. There is a need for better awareness of template technique and their benefits in creating simple and effective requirements for restoring anterior teeth.

Keywords: Esthetics, fracture, template, anterior teeth, Composite Resin, Anterior teeth.

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INTRODUCTION

Anterior crown fractures are a common form of injury that mainly affects children and adolescents. Class IV fracture of the permanent teeth has an intense effect not only on the patient's appearance, but also on function and speech(Sapna *et al.*, 2014).The predictable esthetic restoration of broken incisal edge of maxillary central incisors is a demanding and technique sensitive procedure. Its success is dependent on the operator's skills and knowledge and also on adhering to a systematic and problem solving approach(Dietschi, 2008). A logical method is used to build up morphologically correct composite restorations by careful selection of composite shades, tints and opaquers. In accurate combinations, an illusion of varying translucencies and opacities become visible over natural tooth structure(Barcellos *et al.*, 2011).

Template technique is a convenient technique that consists of incremental layering of composite to restore the fractured anterior teeth(Peyton, 2002). As restoring a fractured tooth is a complex procedure, template technique can prove to be a simple, effective and appropriate technique that will fulfill all the requirements of dental personnels.

The dental composite has emerged as a top ranked material over other direct restorative counterparts. Their evolution since their introduction in dentistry has resulted in better bonding, optical and handling properties. Their performance has also been supported by many longevity studies. Hence the aim of this study was to create awareness on the template technique in restoring esthetics in fractured anterior teeth.A thorough discipline is required for accurate placement of predictable esthetic restorations on anterior teeth which can result in unnecessary provision of an indirect restoration if correct protocol are not followed. A simple protocol like the template technique with adequate communication, if followed, can prove to be of valuable experience to the patient and the practitioner. Our team has extensive knowledge and research experience that has translated into high quality publications (Choudhari and Thenmozhi, 2016; Govindaraju, Jeevanandan and Subramanian, 2017; Ravi *et al.*, 2017; Vikram *et al.*, 2017; Gupta, Ariga and Deogade, 2018; Hannah *et al.*, 2018; Kavarthapu and Thamaraiselvan, 2018; Pandian, Krishnan and Kumar, 2018; Ramamurthy and Mg, 2018; Ashok and Ganapathy, 2019; Ramesh *et al.*, 2019; Sharma *et al.*, 2019; Venu, Raju and Subramani, 2019; Wu *et al.*, 2019; Samuel, Acharya and Rao, 2020)

MATERIALS AND METHOD

A self-constructed questionnaire was created whose validity was checked in standard methods using the online platform "Google Forms". The questionnaire was used to record

responses of participants. Total of 104 people from Saveetha Dental College were made to answer all the questions. The purpose of study was explained to the participants who took the survey, analyses were made using SPSS software version 23.0 .The study was conducted from January 2020 to February 2020 and involved responses from the general public. The datas were analysed using SPSS software for knowing the mean, median and frequency of responses.The obtained data was collected and tabulated, analysed and inferences drawn. The p value obtained from the pie chart was 0.0015 , which is significant.

RESULTS

The data was subjected to descriptive statistics using SPSS software version 22. Each question of the survey was represented by a pie chart.

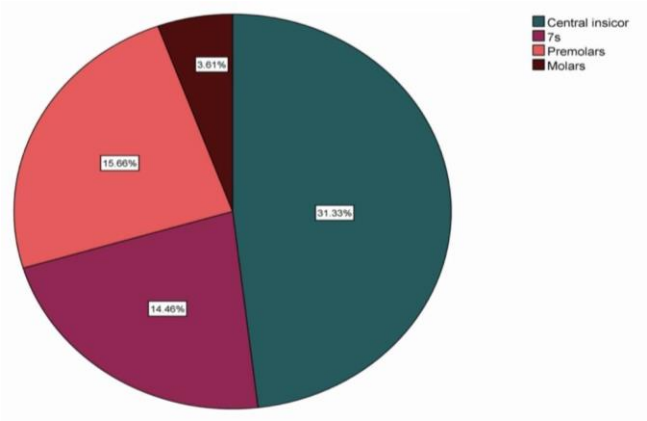

Figure 1: Pie chart showing responses to the most common tooth to be fractured. Green denotes the central incisor (31.33%) , pink denotes canines (14.46%), orange denotes premolar (15.66%) and brown denotes molars (3.61%).

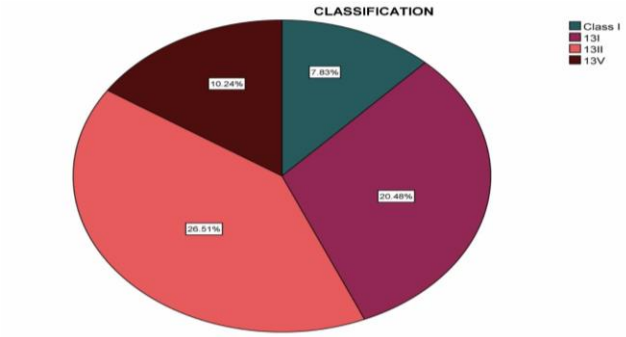

Figure 2: Pie chart showing responses for awareness towards the common class in Ellis classification for fracture, where green denotes class 1 (7.83%), pink denotes class 2 (20.48%), orange denotes class 3 (26.51%) and brown denotes class 4 (10.24%).o

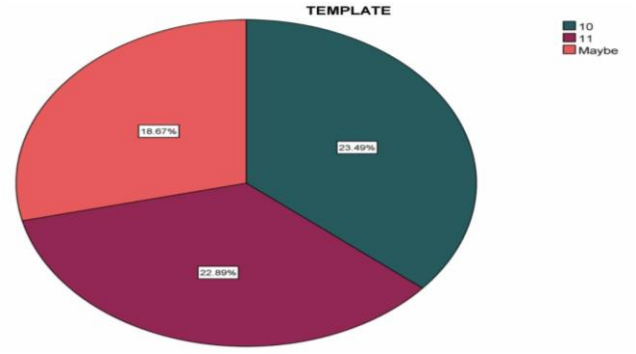

Figure 3: Pie chart denoting responses on awareness in template technique, where green denotes yes (23.49%), pink denotes no (22.89%) and orange denotes maybe (18.67%)

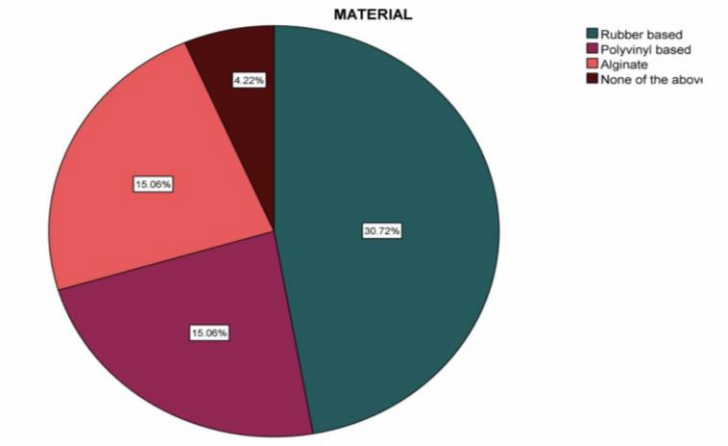

Figure 4: Pie chart represents the responses for best material used in template technique, where green denotes rubber based (30.72%), pink denotes polyvinyl based (15.06%), orange denotes alginate (15.06%) and brown denotes none of the above (4.22%).

DISCUSSION

Earlier studies mention that the management of fractured anterior teeth is an intricate procedure. Treatment objectives vary depending upon certain cardinal factors like age, socio-economic status of the patient and intraoral status at the time of treatment planning(Sabnis *et al.*, 2014).

In our study, the majority of the respondents (23.49%) were aware of template technique, but a study conducted by Meyer revealed that 58% of students were not aware of this technique(Meyer *et al.*, 2020).

A Lyu et al survey conducted revealed that direct technique is the most common technique to restore anterior teeth, but our study showed that majority respondents (33.73%)answered it to be indirect technique(Lyu, Shane and Wehby, 2020).

Our study showed that rubber based materials are best for restoring emulate technique, but a study conducted by Frater revealed that polyvinyl sheets can be used as a material in template technique(Fráter *et al.*, 2021).

27.71% of the respondents in our study do not feel template technique to be a time consuming process , but a study conducted by Xui revealed that the majority of the students feel that template technique is time consuming as well as an expensive technique(K and Rajavardhan, 2014).

Various treatment alternatives are available for restoration of fractured teeth like composite restoration, fixed prosthesis, reattachment of the fracture fragment (if available) Laminated veneers or full coverage restoration may be considered after multiple fragment rebonding / composite resin restorations but this option is not operational owing to loss of healthy tooth structure. Moreover clinician often faces difficulties in colour matching with adjacent un-restored teeth.

In the present case, age of the patient was taken into consideration as the fractured tooth was in its active eruption phase. Various techniques were considered to restore the tooth with composite restoration which includes direct technique; free hand composite restorations; indirect technique; use of preformed crowns / thermoplastic moulds as templates(Chen *et al.*, 2021). Even though preformed crowns and thermoformed templates have shown satisfactory results, there are certain limitations like requisition of specialized armamentarium like vacuum former, time consuming and most importantly proper incremental layering of composite material is not possible . Therefore in the present case a novel approach was used including both direct and indirect methods by using polyvinyl siloxane (PVS) rubber base impression material (putty) as template. This technique allowed incremental layering of the composite material, optimal depth of cure, accurate reproducibility of the anatomic contours and minimal polishing and finishing. Template technique can prove as a simple , economic, effective and appropriate technique that will satisfy all the requirements of dental personnel for esthetic management of anterior crown fracture.

CONCLUSION

The keys to success are strategic control, and careful selection and placement of the desired composite material. The successful management of a patient presenting with such a condition is dependent on the dental operator having a good knowledge of the principles of occlusion, and the available materials and techniques for restoring such cases with a high level of predictability. Direct composite resin bonding agents successfully deal with esthetic problems of maxillary anterior teeth along with a painless approach providing a successful outcome for the dentist and greater satisfaction for the patients. From this study, the respondents have moderate knowledge towards the template technique in restoring the fractured anterior teeth.

Author Contributions: All the authors contributed equally in concept, design, carrying out the research and analysis of the study.

Conflict of interest: The authors have none to declare.

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