

Prevalence of cast post vs. prefabricated post in restoring the upper anterior tooth post root canal treatment.

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Abstract

Aim: To determine the prevalence of cast post vs prefabricated post in restoring the upper anterior tooth post root canal treatment.

Introduction: The endodontically treated teeth with extensive loss of tooth substance have numerous problems due to significant reduction in the capability to resist a myriad of functional forces Today, it is accepted clinical practice to use a post to retain the coronal restoration after a tooth has been endodontically treated when significant amounts of the coronal tooth structure is missing

Materials and Methods: The retrospective study was conducted in a university setting. Data was collected from the patients who visited Saveetha dental college between June 2019 to February 2021. Among 573 patients who had reported to the department of conservative dentistry and endodontics of saveetha dental college, prevalence of cast post vs prefabricated post in restoring the upper anterior tooth post root canal treatment were calculated.

Results: It was noted that the most common age group to undergo treatment for cast post and prefabricated fiber post were patients in the age group of 29-39 years (28.50%) the most prevalent gender to undergo this treatment was Male (56.64%), most prevalent post used in anterior region was prefabricated teeth (81.29%), most prevalent teeth to be treated was central incisor (50.52%).

Conclusion: Within the limitations of the study, it can be concluded the prevalence of prefabricated fiber post in the central incisor was most commonly seen in males than females. Significant association was present between the gender and tooth number with type of post.

Keywords: Cast post, Prefabricated post, Endodontically treated teeth.

Introduction

Dental caries and non-carious lesions is the most common cause for the loss of enamel in a clinical situation [1,2]. Disease of the pulp can be infectious or inflammatory. In such conditions, the healthy pulp attempts to counteract the inflammatory response as a defense mechanism in order to restore the integrity of the pulp [3-5]. The

pathophysiology of spread of infection in the root canal is quite complex, the degradation of matrix during dental caries or injury which if not treated early will lead to inflammatory pulpal destruction [6-9]. The teeth which are infected till the pulp are endodontically treated. Following endodontic treatment the final restoration is given, in cases where there is inadequate amount of tooth structure present then the use of post and core build up is done. The use of a post crown fabricated from gold or silver to restore a root-filled tooth was described more than 20 years ago but [10-12]. Today, it is accepted clinical practice to use a post to retain the coronal restoration after a tooth has been endodontically treated when significant amounts of the coronal tooth structure is missing [13-16]. With the advent of new technology, numerous

prefabricated post systems have been introduced and used successfully in clinical situations, they have reduced chair time and the cost to the patient [17-20].

Following root filling, the custom-made cast metallic post and core with metal-ceramic crowns was the traditional restoration of choice but this has changed [21-24]. The patients' primary motivation for seeking superior dental aesthetics, particularly in the anterior aesthetic zone, has prompted the development of non-metallic restorations [25-28]. Several new types of polymeric and more aesthetic quartz and glass-fibres posts, combined with direct resin composite cores, provide an aesthetic foundation for an all-ceramic crown and have overcome the aesthetic limitations of metallic posts and cores in the anterior teeth. Until recently, there has been controversy in the dental community regarding which material or technique is the most favourable for the restoration of ETT [29-31]. It seems that the amount and retentive capacity of the remaining tooth structure, the position of the tooth in the dental arch, the functional or Para-functional loading on the tooth, and the treatment plan to restore aesthetics and function all influence the selection of the most appropriate post system for each case [32-35].

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Classification of endodontic posts has been made into 2 groups- custom-made, laboratory-fabricated and prefabricated, direct-placements. Prefabricated posts have been made from metals, ceramics, and fiber reinforced, resin-based substrates [36-39]. Cements for prefabricated posts include zinc phosphate, polycarboxylate, glass ionomer, and resin. Metal posts had been considered gold standard for many years, nonmetallic posts have been introduced to address the need for a more esthetic material in the anterior region [40-44]. The placement of a metal post in the anterior region can cause shadowing of the soft tissues adjacent to the root surface, which might affect the esthetic results required for bonded resin and ceramic restorations in the anterior region [45-47].

Factors that determine the success of post and core treatment includes shape of the canal, chemicals that cause loss of tooth structure type of irrigants used, irrigant activation used, reason for root canal treatment like trauma, preoperative considerations of infected /traumatised teeth, calcified canal, materials used for sealing the root canals [48,49].

Our team has extensive knowledge and research experience that has translated into high quality publications [2,6,3-16,25-28,36-44,50]. The aim of the study is to find the prevalence of cast post vs prefabricated post in restoring the upper anterior tooth post root canal treatment.

Materials and Methods

Study Design and Setting

The retrospective study was conducted in a university hospital setting and the available data with similar ethnicity was collected from a particular geographic location. The trends in other locations were not assessed in this study setting. Ethical approval was given by the institutional ethical committee. The retrospective study was conducted in a university setting. Data was collected from the patients who visited saveetha dental

college between June 2019 to February 2021. Among 573 patients who had reported to the department of conservative and endodontics of Saveetha Dental College, prevalence of cast post vs prefabricated post in restoring the upper anterior tooth post root canal treatment were collected. From this data age, gender, type of post, tooth number was recorded. Case sheets were reviewed and cross verification was done by another examiner to avoid errors.

Statistical analysis

Data was recorded in Microsoft Excel (version 2007, office 365) and later exported to IBM SPSS (version 20.0 Chicago, USA) and subjected to Statistical analysis. Chi Square test was then employed with a level of significance set at $P < 0.05$. Chi square test was done to compare the parameters. The outcome was represented in a form of tables and bar charts.

Result and Discussion

It was noted that the most common age group to undergo treatment for cast post and prefabricated fiber post were patients in the age group of 29-39 years (28.50%) (Figure 1) the most prevalent gender to undergo this treatment was Male (56.64%) (Figure 2), most prevalent post used in anterior region was prefabricated teeth (81.29%) (Figure 3), most prevalent teeth to be treated was central incisor (50.52%) (Figure 4) Correlation between the patient age and the type of post were not statistically significant ($p=0.204$) (Figure 5) correlation between gender and the type of post-statistically significant ($p=0.004$) (Figure 6) correlation between the tooth number and the type of post-statistically significant ($p=0.000$) (Figure 7).

The availability of new aesthetic prefabricated fibre post systems has created the need for a systematic evaluation of their physical properties and clinical performance. For direct build-up of the coronal tooth structure after luting a fibre post, many types of resin composite materials have been proposed. Many

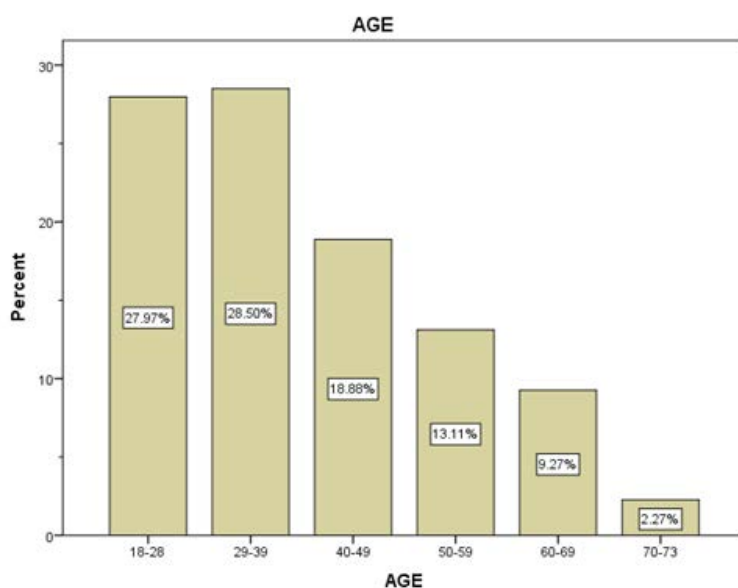


Figure 1. Bar charts show the distribution of patients who underwent cast post and prefabricated fiber post treatment based on age (x-axis represents age group, y-axis represents number of patients). The most common age group to undergo post treatment were patients belonging to the age group of 29-39 years (28.50%).

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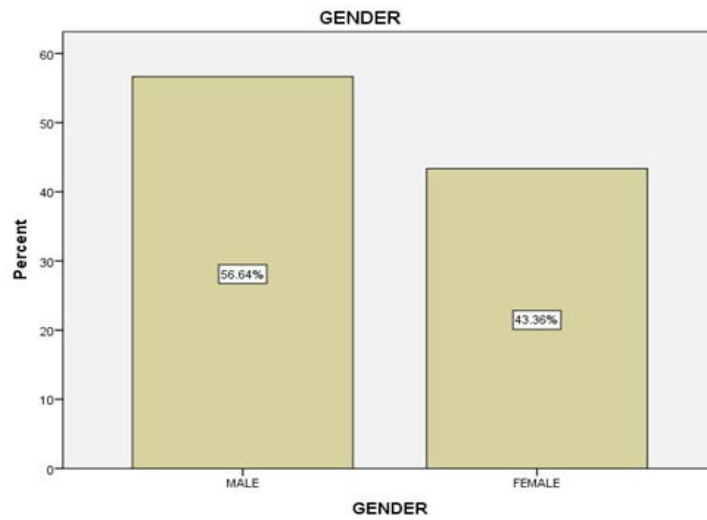


Figure 2. Bar chart indicates the distribution of patients who underwent cast post and prefabricated fiber post treatment based on gender (X-axis represents gender, Y axis represents number of patients). The gender which more commonly underwent treatment was males (56.64%) compared to females (43.36%).

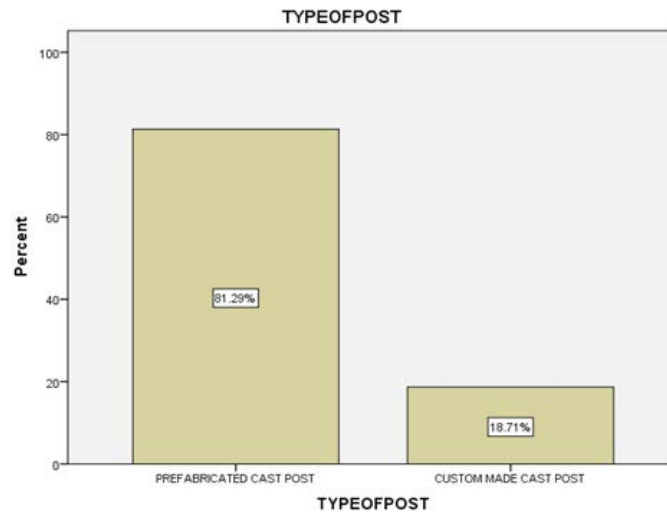


Figure 3. Bar graph shows distribution of patients who underwent cast post and prefabricated fiber post treatment (x- axis represents type of post, y-axis represents number of patients). most prevalent post used in anterior region was prefabricated teeth (81.29%).

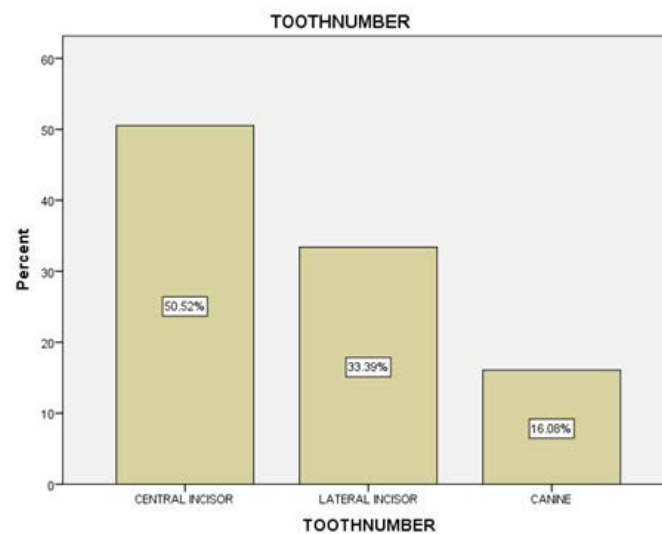


Figure 4. Bar graph shows distribution of patients who underwent cast post and prefabricated fiber post treatment based on teeth number (x-axis represents tooth number, y-axis represents number of patients) The most common teeth to undergo treatment was central incisor.

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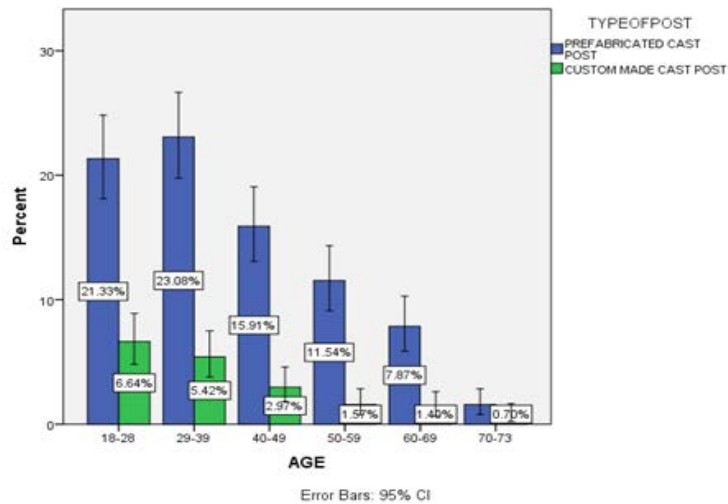


Figure 5. Bar chart shows the association between the type of post and age of the patients treated (X-axis represents the age, Y axis- frequency of distribution of posts cemented based on age) Among the prefabricated cast post 29-39 years patients were more common, Chi-square test was done and the association was found to be statistically not significant. Pearson's value: 7.228 P-value: 0.204(>0.05).

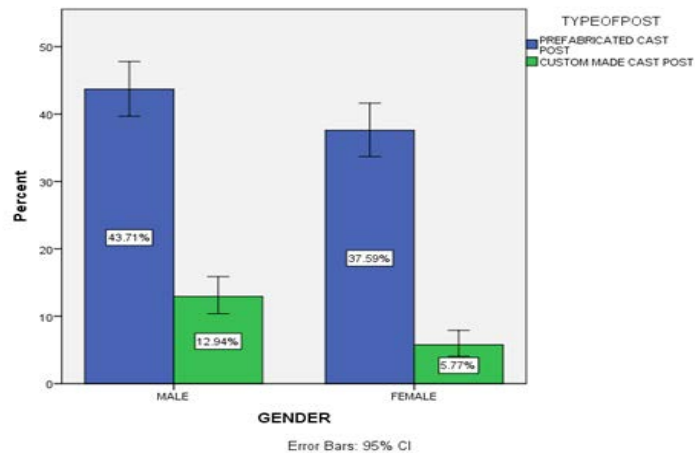


Figure 6. Bar chart shows the association between type of post and gender of the patients treated (X-axis represents gender, Y axis- frequency of distribution of posts cemented based on gender) Among the prefabricated cast post male patients were more common, Chi-square test was done and the association was found to be statistically significant. Pearson's value: 8.395, P-value: 0.004(<0.05), proving that there is an association present in the type of post and gender of the patients who underwent treatment.

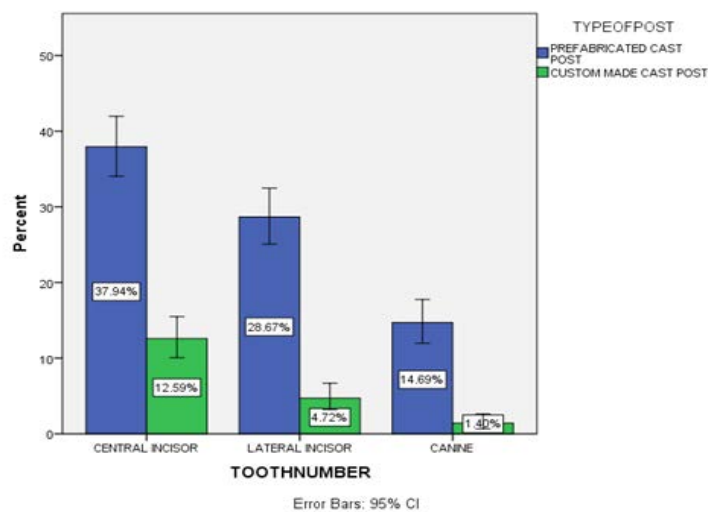


Figure 7. Bar chart shows the association between the type of post and tooth number of the patients treated (X-axis represents the tooth number, Y axis- frequency of distribution of posts cemented based on tooth number) Among the pre-fabricated post central incisors were more common, Chi-square test was done and the association was found to be statistically significant. Pearson's value: 16.008, P-value: 0.000(<0.05), proving that there is an association present in the tooth number and type of post of the patients who underwent treatment.

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different types of posts have been mentioned in the literature [51,52]. At first, cast metal alloy posts and prefabricated posts made of stainless steel, titanium or precious alloys were used. This cast post core system was more time consuming and required an intermediate laboratory phase to elaborate the retaining system, making the procedure expensive. Prefabricated posts did not require the laboratory phase and, therefore, allowed the whole restoration to be performed in one visit, resulting in an easier and less expensive technique.

These newer systems, fibre post have focused on physical properties, such as modulus of elasticity, that are closely matched to dentin to decrease stress concentration within the root canal and reduce the incidence of fracture, The indication for post placement depends on ascertaining the amount of destruction exhibited and whether the remaining tooth structure will support the selected restoration. The main factors that determine the prognosis of restored pulpless teeth have been the preservation of healthy dentin, the ferruling of crown margins on sound tooth structure, and the type of intermaxillary relation. Since in most cases there is no sound tooth structure it is generally not indicated to use veneers for anterior teeth replacement. A veneer is a thin sheet of material placed on the front surface of the tooth, used for aesthetic purposes and protection. It is usually a thin layer of restorative material replacing the enamel [53-55]. Fiber-reinforced composite posts are indicated when restoring endodontically treated teeth to provide retention of the core and for root reinforcement.

Conclusion

Within the limitations of the study, it can be concluded the prevalence of prefabricated fiber post in the central incisor was most commonly seen in males than females. Significant association was present between the gender and tooth number with type of post. Prefabricated fibre posts and all-ceramic restorations offer a promising alternative to the restoration of anterior ETT with cast metallic posts and porcelain fused to metal crowns.

Conflict of Interest

None to declare.

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