Preferred Post Endodontic Restorations in Paediatric Dentistry

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Abstract
Introduction Endodontically treated teeth might undergo loss of tooth structure and change their physical characteristics. The main objective of restoring after endodontic treatment is to maintain a normal function, occlusion and stabilize the dental arch. The present study is aimed at assessing the most preferred post endodontic restorations. Materials and methods Data is extracted from Patient management software of Saveetha dental college. The data collected were reviewed and cross verified. The collected data is entered in MS Excel sheet and transferred to SPSS version 23 for analysis. Chi square test is used for analysis. P value less than 0.05 was considered statistically significant. Results were made into graphs and evaluated. Results Majority of the patients had stainless steel crowns placed in posterior teeth after pulp treatment and acrylic crowns in anterior teeth after pulp treatment. Chi square test was done, p value was found to be statistically significant ($p<0.05$). Conclusion Within the limits of the present study, it is observed that the majority of the patients had stainless steel crowns placed in posterior teeth after pulp treatment and acrylic crowns in anterior teeth after pulp treatment, and it was found to be statistically significant ($p<0.05$).
Keywords: Endodontic, crown, stainless steel, root canal treatment

1. Introduction

The objectives of a restoration after root canal treatment are (i) to restore the form, function and aesthetics (ii) prevent bacterial microleakage (iii) ensure periodontal health (iv) protect the residual tooth structure (v) prevent fracture (1). The final restoration should be done after root canal treatment to prevent coronal microleakage. Delaying restoration and filling temporary obturation for a long time enhances the risks of periapical recontamination (2,3).

Endodontically treated teeth might undergo loss of tooth structure and change their physical characteristics. The main objective of restoration after endodontic treatment is to maintain a normal function, occlusion and stabilize the dental arch (4). Endodontic treatment is done when the teeth are affected by caries, repeated restorations and periapical lesions. Such teeth are weakened by the endodontic procedure (5). The longevity of such teeth depends on the remaining tooth structure, type of final restoration, post and core material used (5,6)(2).

The type of restoration chosen after root canal treatment depends on the amount of remaining hard tooth structure available. Full crown is indicated when the tooth is heavily infected involving the cervical enamel or if there are previous prosthetic preparations. Overlays are preferred if there is enough tooth structure or if there are no previous prosthetic restorations (7). Restorations after root canal treatment are preferred not only for permanent teeth but also for primary teeth. Primary teeth are protected with crowns after filling the root canals until the tooth exfoliates (8). The present study is aimed at assessing the most preferred post endodontic restorations. Our team has extensive knowledge and research experience that has translated into high quality publications (9–21) (22–28).

2. Materials and Methods

The present study is a retrospective study. This study was approved by the institutional ethic board. Data is extracted from Patient management software of Saveetha dental college from the time period feb 2020-feb 2021. Patients under 18 years of age who underwent endodontic therapy were included and patients who underwent crown placement without

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endodontic procedure were excluded from the present study. The data collected were reviewed and cross verified. The collected data is entered in MS Excel sheet, and transferred to SPSS version 23 for analysis. Chi square test is used for analysis. Results were made into graphs and evaluated.

3. Results

Based on the inclusion and exclusion criteria, 985 patients who underwent pulp treatment followed by crown placement were used for the present study. Out of 985 patients, 551 patients were males and 434 were females. P value less than 0.05 is considered statistically significant.

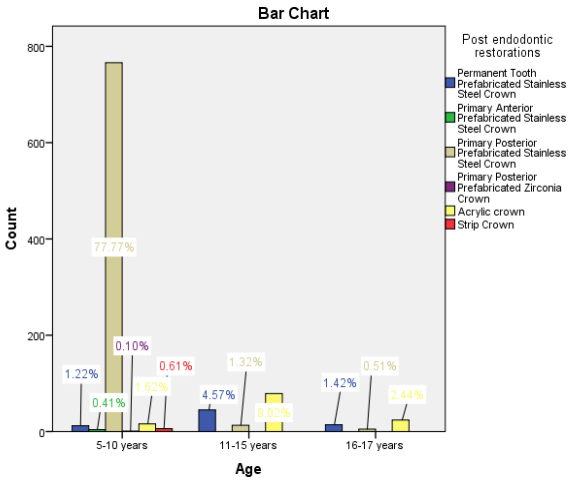

Figure 1: Bar chart showing association between age and post endodontic restorations.

77.7% of patients aged between 5-10 years had stainless steel crown in the posterior primary teeth after endodontic treatment. 8% of patients aged between 11-15 years had acrylic crown placement. 2.4% of patients aged between 11-15 years had acrylic crown placement. Chi square test was done to find the association between age and post endodontic restorations and it showed statistically significant p value (p<0.05).

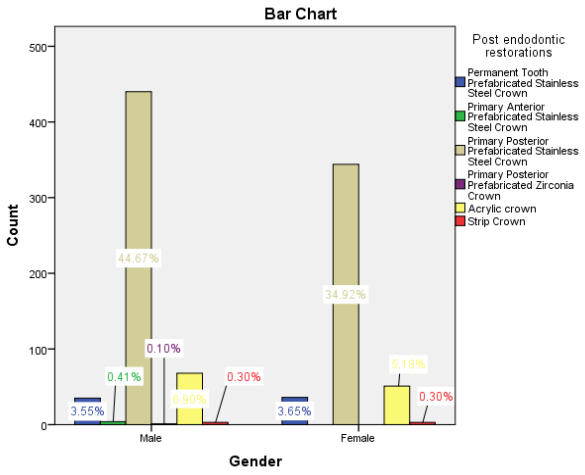

Figure 2: Bar chart showing association between gender and post endodontic restorations.

44.6% male patients and 34.9% female underwent stainless steel crown placement in the posterior primary teeth after endodontic treatment. 6.9% male patients and 5.1% female underwent acrylic crown placement after endodontic treatment.

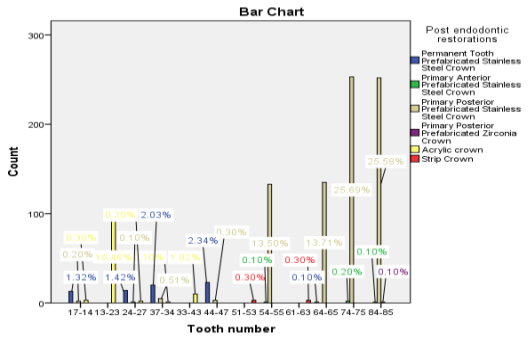

Figure 3: Bar chart showing association between tooth number and post endodontic restorations

10.4% patients had acrylic crown for their upper anterior permanent teeth (13-23). 25.6% patients had stainless steel crown placement in the posterior primary teeth. 0.3% patients had strip crowns placement for their upper anterior primary teeth (51-53, 61-63). Chi square test was done to find the association between tooth number and post endodontic restorations and it showed statistically significant p value (p<0.05).

4. Discussion

Root canal treatment involves a process named cleaning and shaping of the root canal that can lead to weakening of the tooth. Dentin becomes brittle after removing the pulp (29). Hence the tooth needs to be restored directly or indirectly, depending on the amount of tooth structure remaining. Direct technique is when the restorative material (like amalgam or composite) is directly placed into the tooth. It requires a single appointment and a simpler method. But in some cases the tooth won't survive by direct restoration. (30,31). Hence indirect technique is used. It is when crowns are fabricated and placed on the tooth. Crowns used to protect the endodontically treated tooth are made with materials like metal or ceramic. Crowns are much more effective than conventional fillings but it requires laboratory work, more cost and it needs more than 1 appointment (8). Previous studies have stated that root canal treated posterior teeth are lost at a much higher rate due to lack of crowns. Hence crowns need to be placed after root canal treatment to withstand the occlusal forces of mastication (32). Stainless-steel crowns are used in severe multiple surface lesions like caries, fracture and in teeth that underwent pulp treatment (33). They are one of the earliest and commonly used crowns. They are preferred because of their high strength, durability, and wear resistance. However, they are preferred only for posterior teeth mainly because of their color (34). Previous studies have also stated that stainless steel crowns are one of the best options after endodontic treatment. Study conducted by Patel RV reported that stainless steel crowns are preferred over composite restoration after pulp therapy for the longevity of the tooth and to prevent retreatment

(35). In the present study, stainless steel crowns were most preferred after pulp treatment in posterior primary and permanent teeth.

Acrylic crowns are commonly used in anterior primary and permanent teeth for its esthetics. It can be used as long-term provisional restorations (36). It also has better retention and stability, especially in cases where there is minimum tooth structure present (37). Even in the present study most of the patients had undergone acrylic crown placement for their upper anterior teeth. Strip crowns are prefabricated transparent crowns for anterior teeth. Esthetically, they are better, but its retention depends on the amount of tooth structure remaining after caries removal (38). Both zirconia crowns and strip crowns are popular due to their aesthetics and strength. But some do not prefer zirconia crown due to its high cost and extensive tooth preparation (39). In the present study, 0.3% patients had strip crowns placement for their upper anterior primary teeth.

Zirconia crowns are also commonly preferred crowns because of their strength, resistance to strong forces. The monolithic zirconia crown placement requires a smaller amount of tooth structure trimming compared with the all-ceramic crown, thus retaining a more natural tooth structure (40). Previous studies have stated that the zirconia crown had very mild effects on the periodontal tissues and less attrition of the opposing crown, thereby having good potential in the clinical application of short term posterior teeth restorations (38,41). When compared to stainless steel crown, zirconia crown is much more effective and acceptable, because of its color. But when compared to stainless steel crown, zirconia crown had more plaque accumulation (42). In the present study, 0.1% patients had prefabricated zirconia crown placement in posterior teeth especially in 84 and 85.

5. Conclusion

Crown placement after root canal treatment is necessary to maintain the longevity of the restoration and to prevent further damage / infection of the tooth structure. Within the limits of the present study, it is observed that the majority of the patients had stainless steel crowns placed in posterior teeth after pulp treatment and acrylic crowns in anterior teeth after pulp treatment. Chi square test showed statistically significant p value ($p<0.05$).

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Conflict of Interest: None

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