

Evaluation of quality of obturation in 6-9-year-old children

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ABSTRACT

The effectiveness of root canal therapy is dependent on the quality of obturation. The objective of the current study was to evaluate the obturation quality in pediatric patients of age 6–9 years reporting for pulpectomy treatment. Among the comprehensive data of patients attending Saveetha Dental College, a retrospective analysis of all the patients referred for pulpectomy was extracted. SPSS software version 19 was used to analyze the data gathered. Data were statistically evaluated using the Chi-square test. **RESULTS:** In the present study carried out, it was observed that the most frequent quality of obturation was normal (12.36%) and it is higher in the 7-year-old age category. The second frequent quality of obturation was voids (6.55%) and its higher in the 9-year-old age category. The results obtained were positively significant ($P < 0.05$). The most frequent quality of obturation was normal and it is higher in the 7 years category. The second frequent quality of obturation was voids with higher level in the 9 years category.

Key words: Pulpectomy, quality of obturation, root canal treatment, voids

INTRODUCTION

Caries in the teeth is a typical occurrence worldwide. It can manifest in the form of early childhood caries in children.^[1] This is a particularly dangerous type of dental caries. It can start at a young age and progress quickly. They usually affect the proximal and occlusal/incisal portions of the mouth. Early childhood caries is characterized as one or more decayed, filled, or missing teeth in children aged 71 months or younger. Caries most typically affects the maxillary anterior teeth as a result of poor eating habits.^[2] The severity of the condition is proportional to the state of

oral hygiene and maintenance.^[3] The major goal of pulp therapy is to keep the teeth healthy and in good shape. A pulpectomy is a root canal treatment for primary teeth that have become irreversibly inflamed or necrotic as a result of caries or trauma. In most cases, rotating hand files are used.^[4] The use of sodium hypochlorite/chlorhexidine for optimal bacterial disinfection of the coronal is critical. The mandibular posterior area is where the majority of pulpectomy treatments are conducted.^[5] The basic purpose of pulpectomy and the components utilized is to allow resorption of the primary tooth root while not interfering with the eruption of permanent teeth. The major goal of preparing root canals is to eliminate bacteria-containing tissues. This will make it easier for the irrigant to reach the root's apical third, resulting in a sterile root canal ready for obturation.^[6] Reamers, files, burs, sonic instruments, and Nickel–Titanium (Ni–Ti) rotary file systems are used in endodontic procedures. Rotary devices have grown in popularity as a way to reduce iatrogenic mistakes in

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endodontic treatment.^[7,8] The most significant advantage of employing rotary Ni–Ti files over the traditional method is the reduction in working time. According to previous research, the different file systems such as conventional files, ProTaper, and K3 had similar results in terms of obturation quality, but they differed in instrumentation time.^[7] The cornerstone to a successful endodontic therapy is bacterial elimination from the root canals.^[9] Each phase of pulpal therapy, including the aseptic approach, root canal cleaning and shaping, root canal irrigation and disinfection, and, last but not least, root canal filling, should be done without pain.^[10] Poor technique can show up in a variety of ways. Our research and knowledge have resulted in high-quality publications from our team.^[11-25]

Overfill and underfill, as well as flaws in the obturation such as voids, uniformity, and lack of homogeneity, are some of the issues that have an impact on prognosis and treatment outcomes.^[12]

MATERIALS AND METHODS

The current research is a recollective study carried out in a health-care facility under a specific population, predominantly the South Indian population. It was carried out under the Institutional Review Board approval (IHEC/SDC/PEDO/21/271).

In this study, records from 500 patients between June 2020 and March 2021, were gathered and analyzed completely from a patient management software (DIAS). Data including patients' name, age, gender, and radiographs used in patients who underwent pulpectomy were collected. The quality of obturation was assessed from the radiographs of pulpectomy based on the filling of canals as normal, overfill, underfill, or voids. The collected data were cross-checked by

different investigators for additional analysis. The records were tabulated in spreadsheets and SPSS software 20.0 (IBM, Sydney, Australia) was used for analysis. Chi-square test was performed with $P \leq 0.05$.

RESULTS

In the present study, it was found that among 500 patient records, 280 patients underwent pulpectomy. Out of which, 182 patients were male (65.09%) and 98 patients were female (34.91%) [Figure 1]. Children in 6-year-old category were found to be 38 (13.45%), 7-year-old category were found to be 110 (39.27%), 8-year-old category were found to be 74 (26.55%), and 9-year-old category were found to be 58 (20.73%) [Figure 2].

The frequent quality of obturation in the current study was normal > Extrusion of materials > Void > Overfill > Underfill [Figure 3]. The prevalence of normal obturation quality was found to be 88 (31.64%), prevalence of voids was found to be 50 (17.82%), prevalence of overfill was found to be 46 (16.36%), prevalence of underfill was found to be 35 (12.36%), and prevalence of extrusion of material was found to be 61 (21.82%) in the study among the 6–9-year-old pediatric population [Figure 4].

In correlation between the age and the quality of obturation, it was observed that the most frequent quality of obturation was normal (12.36%) and it is higher in the 7-year-old categories. The second frequent quality of obturation was voids (6.55%) and its higher in the 9-year-old categories. The results obtained using the Chi-square test were statistically significant ($P > 0.005$) [Figure 4].

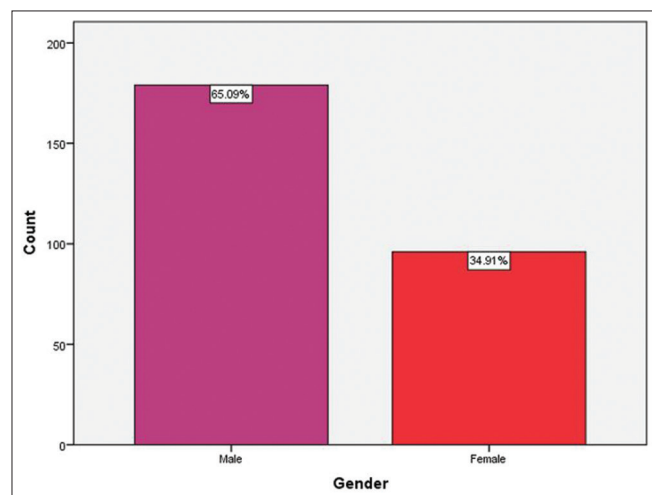


Figure 1: Bar chart depicting the gender population involved in the overall study. Out of which, 65.09% were male population and 34.91% were the female population

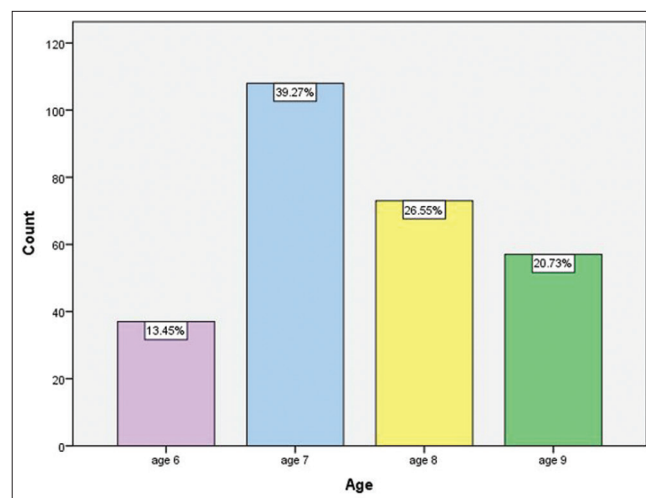


Figure 2: Bar chart depicting the age group involved in the study. Children in 6-year-old category were found to be (13.45%), 7-year-old category were found to be (39.27%), 8-year-old category were found to be (26.55%), and 9-year-old category were found to be (20.73%)

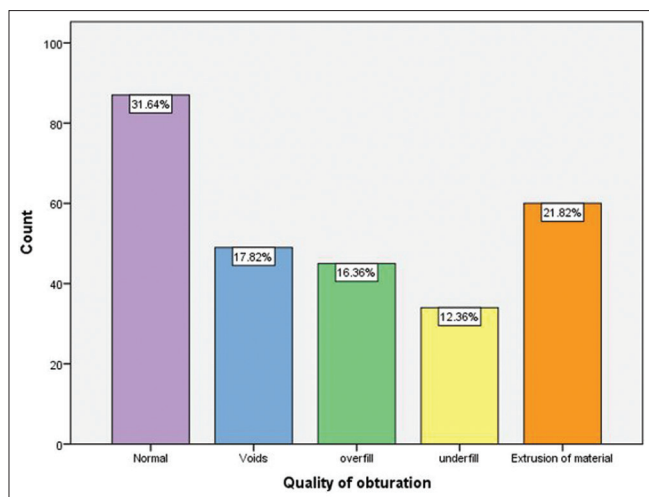


Figure 3: Bar chart depicting the quality of obturation involved in this study. Out of which (31.64%) were of normal quality, (17.82%) were voids, (16.36%) were overfilled, (12.36%) were underfilled, and (21.82%) had extrusion of material

DISCUSSION

Students and practitioners alike should take extra precautions to maintain the working length accurately during the entire treatment.^[11] Inadequate length measurement, failure to maintain working length, lack of recapitulation, inadequate filling, use of rigid files, differences in canal structure such as severe curvature and small canals, insufficient irrigation between each filling, and so on, can contribute to the error.^[13] Furthermore, in the 6–9 age group, sclerotic canals and pulp stones may have a vital part in the increasing occurrence of voids. Without a doubt, every effort should be made to prevent making this type of procedural blunder.

CONCLUSION

Based on the present retrospective study, the most frequent quality of obturation was normal, and it is higher in the 7-years-old categories. The second frequent quality of obturation was voids and its higher in the 9-year-old categories.

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Conflicts of interest

There are no conflicts of interest.

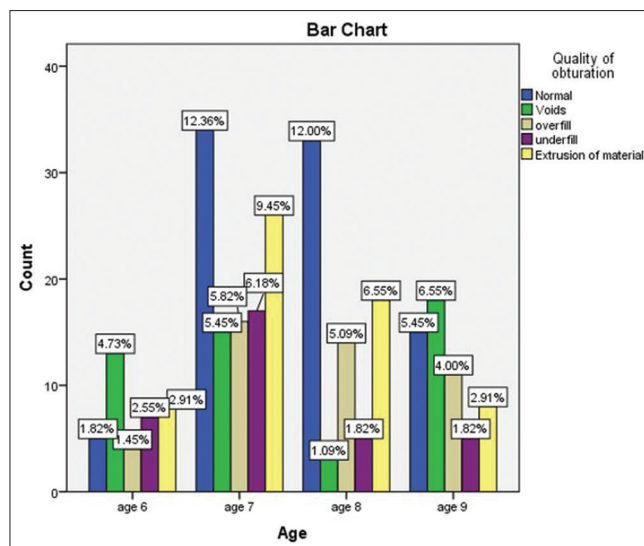


Figure 4: Bar chart depicting the correlation between the age and the quality of obturation it was observed that the most frequent quality of obturation was normal (12.36%) and it is higher in the age group of 7 years. The second frequent quality of obturation was voids (6.55%) and its higher in the age group of 9 years. The results obtained in the Chi-square test were statistically significant ($P > 0.005$)

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