

COMPARATIVE EVALUATION OF OBTURATION QUALITY BETWEEN HAND K-FILES AND ROTARY KEDO-S FILES IN PRIMARY MANDIBULAR MOLARS

Dr. Milind Rajan¹, Dr. Vishnuja VR Nair², Dr. Pratik Surana^{*3}, Dr. Khushboo Malhotra⁴, Dr. Shivani Vaishnav⁵, Dr. Minoti Vyas⁶,

¹Postgraduate Student, Department of Pedodontics and Preventive Dentistry, Coorg Institute of Dental Sciences, Virajpet, Karnataka.

²Postgraduate Student, Department of Conservative Dentistry and Endodontics, KVG Dental College and Hospital, Sullia, Karnataka.

³Senior Lecturer, Department of Pedodontics and Preventive Dentistry, Maitri College of Dentistry and Research Center, Durg, Chhattisgarh.

^{4,5,6}MDS (Pedodontics and Preventive Dentistry), Ahmedabad Dental College and Hospital, Ahmedabad, Gujarat.

***Corresponding Author: Dr. Pratik Surana, MDS**

Senior Lecturer, Department of Pedodontics and Preventive Dentistry, Maitri College of Dentistry and Research Center, Durg, Chhattisgarh.

Email id: suranadrpratik@gmail.com Contact number: 08871310111

Article Received on 19/01/2021

Article Revised on 09/02/2021

Article Accepted on 02/03/2021

ABSTRACT

Aim: To compare obturation quality between Hand K-files and Rotary Kedo-S files in primary mandibular molars.

Method: A randomized clinical trial was carried on 30 patient aged between of 4–8 years requiring pulpectomy in primary mandibular molars. Patients were equal distributed for instrumentation with Hand K files and Rotary Kedo-S files. **Results:** With respect to quality of obturation among the groups, in Group 1 (Hand K files): 53.33 % of the canals were optimally filled; 26.66% and 3% were under and over filled, respectively. In Group 2 (Rotary Kedo S): 80.00% of the canals were optimally filled; 6.66% were under and 13.33% were over filled each.

Conclusion: Rotary Kedo-S files have better obturation quality as compared to Hand K file.

KEYWORDS: Pulpectomy, Rotary endodontics, Kedo-S file, K file.

INTRODUCTION

The goal of pulp therapy in the primary dentition is to retain the primary tooth as a fully functional part of the dentition, allowing at the same time for mastication, phonation, swallowing, and the preservation of the space required for the eruption of the permanent tooth.^[1] The premature loss of primary teeth may cause changes in the chronology and sequence of the eruption of permanent teeth.^[2]

The treatment options available in cases of advanced pulpal degeneration that affects radicular pulp tissue are extraction and pulpectomy. Pulpectomy technique is considered over extraction since the successfully treated teeth can be retained in a non-pathologic state until they exfoliate.^[3]

According to the guidelines of the American Academy of Pediatric Dentistry, pulpectomy is indicated in primary teeth with carious pulp exposures in which, following coronal pulp amputation, the radicular pulp exhibits clinical signs of hyperemia or evidence of necrosis of the radicular pulp with or without caries involvement.^[4] The success of pulpectomy is greatly determined by the biomechanical preparation.^[5] The presence of accessory

foramina in the furcation and ectopic root resorption makes cleaning and shaping of primary root canals more difficult.^[6]

Conventionally, hand files are used for cleaning and shaping and are time consuming. The length of the appointment is strongly associated with the child's behaviour.^[7] Barr et al. was the first to use rotary NiTi files for primary root canal preparation. They reported that use of NiTi files for root canal preparation in primary teeth was cost-effective, faster, and resulted in uniform and predictable fillings. Investigators have evaluated various root canal systems and compared the efficacy of instrumentation between the hand and rotary files.^[8] Hence, the present study aims to comparatively evaluate the obturation quality using manual (K- File) with Rotary (Kedo – S files) in primary mandibular molars.

METHODOLOGY

Present randomized clinical trial was carried out in the Department of Pedodontics and Preventive Dentistry after receiving approval institutional ethical committee. The informed written consent was obtained from the parents of the children who were willing to participate in

the study. 30 children aged between of 4–8 years requiring pulpectomy in primary mandibular molars were randomly allotted in two equal groups.

The selection of the children was based on the following criteria: (a) vital or nonvital mandibular primary molars without sinus tract, (b) absence of internal or external pathologic root resorption, (c) presence of adequate coronal tooth structure to receive SS crown. The children lacking cooperative ability, children with underlying systemic diseases, and children with special health care needs were excluded from the study. All the procedures were done by a single operator. After confirmation of the diagnosis, local anesthesia was administered using 2% lignocaine with 1:200,000 adrenaline. Using a round carbide bur in a high speed handpiece, the superficial caries and roof of the pulp chamber were removed. Coronal pulp amputation was done with spoon excavator. No. 10 size K file was used to determine the patency of the canals. The working length was determined with radiograph and was kept one mm short of the apex. The canal preparation was done using:

Group 1: Hand K file

Group 2: Rotary Kedo S file

The canals were then irrigated with saline and sodium hypochlorite and dried using sterile paper points. The obturation was done using combination of calcium

hydroxide and iodoform paste by gently pushing with cotton pellets. A post obturation radiograph was taken to assess the quality of obturation. It was assessed by another pediatric dentist who was blinded to the type of instrumentation used for canal preparation. The obturation quality was graded as under fill, optimal fill, over fill.

The glass ionomer cement was given as the post obturation filling. The pulpectomy treated teeth were restored with SS crowns either on the same day or in the next appointment. The data were entered over a spreadsheet, and statistical analysis was performed using SPSS software version 17 (IBM, Chicago, United States).

RESULTS

In present study total of 30 children participated in the study. With respect to quality of obturation among the groups, in Group 1 (Hand K files): 53.33 % of the canals were optimally filled; 26.66% and 3% were under and over filled, respectively. In Group 2 (Rotary Kedo S): 80.00% of the canals were optimally filled; 6.66% were under and 13.33% were over filled each. Results of unpaired *t*-test comparing the obturation quality between the two groups reveal a statistically significant result of Kedo-S rotary files showing better obturation quality as compared to K hand files ($P < 0.001$).

(Table no: 1)

Orbturation Quality	Hand K File	Rotary Kedo S File	P Value
Optimal Filling	8 (53.33%)	12 (80%)	< 0.001
Under Filling	4 (26.66%)	1 (6.66%)	
Over Filling	3 (20%)	2 (13.33%)	
Total	15(100%)	15 (100%)	

DISCUSSION

The present study compared the quality of obturation of Hand K files and Rotary Kedo S file in the preparation of primary molars. The success of an endodontic procedure depends on an effective mechanical debridement and obturation quality.^[9] Although manual instrumentation is widely used in primary teeth, there are limitations regarding effective cleaning of root canals, possible ledge formation, perforations, dentine compaction, and instrument fracture.^[10] Priyadarshini P et al. found (2020) no significant difference in cleaning efficiency between manual and rotary techniques stating that manual instrumentation is equally effective. The present study shows a higher number of optimal obturation with Rotary Kedo S files, as compared to more under obturation with Hand K files group. The reason for better obturation quality with Kedo-S files can be due to the use of Ni–Ti material used, which increases the flexibility of files and the variably variable taper that is present. This aids in the adaptation of files to the primary canal curvature, rather than increased zipping and transportation as in stainless steel hand instrumentation.^[11]

CONCLUSION

Rotary Kedo S files showed a better quality of obturation in primary mandibular molars as compared to conventional hand K files. It can be used as advanced alternative to the existing conventional K hand files.

REFERENCES

1. Fuks AB. Current concepts in vital primary pulp therapy. *Eur J Paediatr Dent*, 2002; 3: 115-20.
2. Vieyra JP, Enriquez FJJ. Instrumentation Time Efficiency of Rotary and Hand Instrumentation Performed on Vital and Necrotic Human Primary Teeth: A Randomized Clinical Trial. *Dentistry*, 2014; 4: 214.
3. Ochoa-RomeroT, Mendez-Gonzalez V, Flores-Reyes, Pozos-Guillen AJ. Comparison Between Rotary and Manual Techniques on Duration of Instrumentation and Obturation Times in Primary Teeth. *The Journal of Clinical Pediatric Dentistry*, 2011; 35(4): 359-64.
4. American Academy of Pediatric Dentistry. Guidelines on pulp therapy for primary and immature permanent teeth. *Ref Man.*, 1996; 34: 12-3.

5. Haapasalo M, Endal U, Zandi H, Coil JM. Eradication of endodontic infection by instrumentation and irrigation solutions. *Endod Top*, 2005; 10: 77-102.
6. Pinheiro SL, Schenka AA, Alves-Neto AA, Souza CP, Rodriguez HM, Ribeiro MC. Photodynamic therapy in endodontic treatment of deciduous teeth. *Lasers Med Sci.*, 2009; 24: 521-6.
7. Govindaraju L, Jeevanandan G, Subramanian EMG. Application of rotary endodontics in pediatric dentistry - A review of literature. *Journal of Pharmacy Research*, 2018; 12(4): 480-3.
8. Madan N, Rathnam A, et al. K-file vs ProFiles in cleaning capacity and instrumentation time in primary molar root canals: an *in vitro* study. *J Ind Soc Pedod Prev Dent*, 2011; 29(1): 2-6. DOI: 10.4103/0970-4388.79907.
9. Tabassum S, Khan FR. Failure of endodontic treatment: The usual suspects. *Eur J Dent*, 2016; 10: 144-7.
10. Silva LA, Leonardo MR, Nelson-Filho P, Tanomaru JM. Comparison of rotary and manual instrumentation techniques on cleaning capacity and instrumentation time in deciduous molars. *J Dent Child*, 2004; 71: 45-7.
11. Priyadarshini P, Jeevanandan G, Govindaraju L, Subramanian EM. Clinical evaluation of instrumentation time and quality of obturation using paediatric hand and rotary file systems with conventional hand K-files for pulpectomy in primary mandibular molars: A double-blinded randomized controlled trial. *Eur Arch Paediatr Dent*, 2020; 17: 1-9.