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## Original Research

### Comparison of Kedo- S rotary file system, universal protaper and manual instrumentation in pediatric patients- A clinical study

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#### ABSTRACT:

**Background:** The present study was conducted to compare Kedo- S rotary file system, universal protaper and manual instrumentation in pediatric patients. **Materials & Methods:** The present study was conducted on 60 children age ranged 4- 8 years of both gender. Patients were divided into 3 groups. Group I (N = 20): The root canals were instrumented with Kedo-S paediatric rotary files as per manufacturer's recommendation. Group II (N = 20): the root canals were instrumented with Protaper and group III root canals were manual hand files. Obturation was done as per standardized criteria. **Results:** The quality of obturation was under fill in 12% in group I, 13% in group II and 6% in group III, optimal 68% in group I, 60% in group II and 54% in group III, over fill 20% in group I, 27% in group II and 40% in group III. The difference was significant (P< 0.05). The mean instrumentation time in group I was 45.8 seconds, in group II was 56.4 seconds and in group III was 65.2 seconds. The difference was significant (P< 0.05). **Conclusion:** Kedo- S files were better in terms of instrumentation time and obturation as compared to protaper and manual files in children.

**Key words:** Kedo- S files, Protaper, Manual files

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#### INTRODUCTION

The goal of root canal therapy is the elimination of infected tissue and prevention of apical tissue. Proper root canal shaping is the predictive factor for the success of endodontic treatment.<sup>1</sup> Root canal shaping aims to eliminate microorganism, remove infected and necrotic dentin and shape the root canal system. Mechanical root canal instrumentation should create a continuous tapered preparation in order to facilitate antiseptic irrigation and the placement of filling materials. Various techniques have been proposed for canal preparation including coronal-

apical and apico-coronal. In endodontics, shaping of root canals has been proposed using various Ni-Ti rotary instruments.<sup>2</sup>

Bio-mechanical preparation with rotary files in primary teeth gained popularity when the first case was reported by Barr et al using Profile 0.04 taper rotary instruments. Since then the practice of using various rotary Ni-Ti systems for instrumentation of the primary root canal is emerging among pediatric dentists. Studies have been conducted to evaluate the efficiency of using rotary instrumentation.<sup>3</sup>

Kedo-S rotary file is a single file system consisting of D1, E1 and U1 files. The total length of these files is 16 mm and the working area (cutting flutes) 12 mm in length. The uniqueness of these files is the presence of variable taper (4–8%) with varying tip diameter D1-0.25, E1-0.30 and U1-0.40 corresponding to its use in primary teeth.<sup>4</sup> The present study was conducted to compare Kedo- S rotary file system, universal protaper and manual instrumentation in pediatric patients.

**MATERIALS & METHODS**

The present study was conducted in the department of Pedodontics. It comprised of 60 children age ranged 4- 8 years of both gender. Ethical clearance was obtained prior to the study. Consent was obtained from parents of all children before the procedure.

Information such as name, age, gender etc. was recorded. Patients were divided into 3 groups. Group I (N = 20): The root canals were instrumented with Kedo-S paediatric rotary files as per manufacturer’s recommendation. Group II (N = 20): the root canals were instrumented with Protaper and group III root canals were manual hand files. Obturation was done as per standardized criteria. A postobturation radiograph was taken to assess the quality of obturation. The assessment of obturation quality was graded as under filling-all the canals were filled more than 2 mm short of the apex, optimal filling- one or more of the canals having ZOE ending at the radiographic apex or upto 2 mm short of the apex, over filling any canal showing ZOE outside the root. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

Groups	Group I	Group II	Group III
Methods	Kedo-S rotary files	Protaper files	Manual hand files
Number	20	20	20

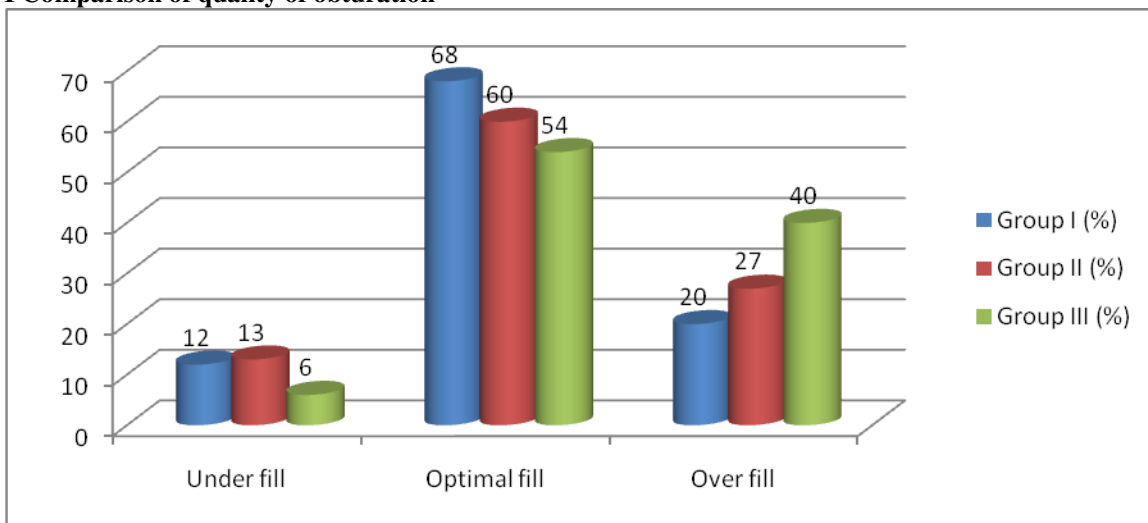
Table I shows that group I root canals were instrumented with Kedo-S paediatric rotary files, group II with Protaper and group III with manual hand files.

**Table II Comparison of quality of obturation**

Quality	Group I (%)	Group II (%)	Group III (%)	P value
Under fill	12	13	6	0.05
Optimal fill	68	60	54	0.12
Over fill	20	27	40	0.01

Table II, graph I shows that quality of obturation was under fill in 12% in group I, 13% in group II and 6% in group III, optimal 68% in group I, 60% in group II and 54% in group III, over fill 20% in group I, 27% in group II and 40% in group III. The difference was significant (P< 0.05).

**Graph I Comparison of quality of obturation**

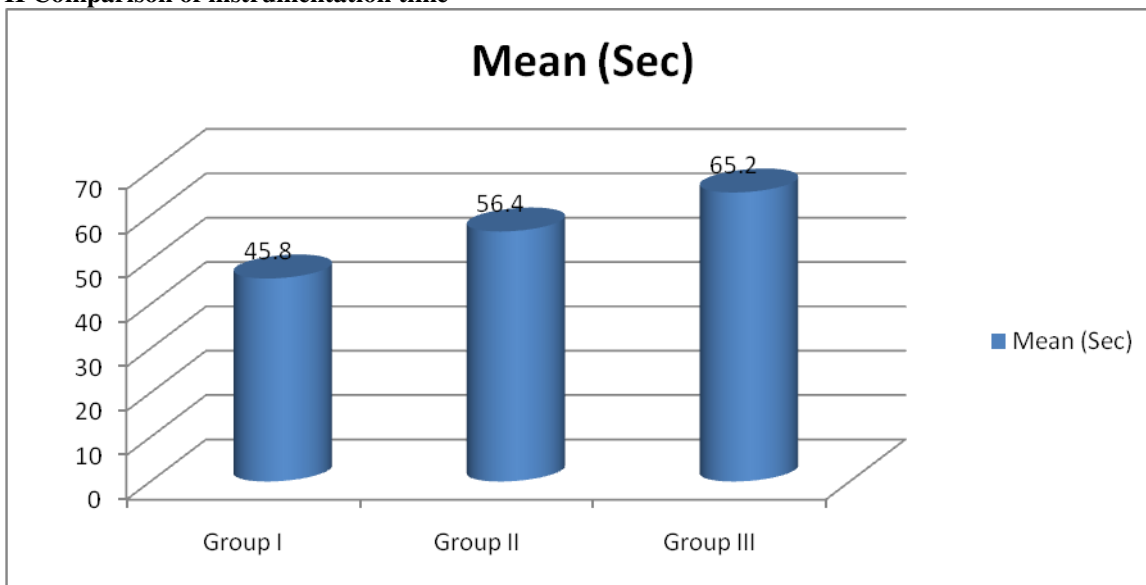


**Table III Comparison of instrumentation time**

Group	Mean (Sec)	P value
Group I	45.8	0.05
Group II	56.4	
Group III	65.2	

Table III, graph II shows that mean instrumentation time in group I was 45.8 seconds, in group II was 56.4 seconds and in group III was 65.2 seconds. The difference was significant ( $P < 0.05$ ).

**Graph II Comparison of instrumentation time**



**DISCUSSION**

There has been a paradigm shift in treating infected primary teeth in children from extractions to pulpectomy which has become an important endodontic procedure in children so as to preserve the arch length and guide the underlying successors eruption.<sup>5</sup> In children, the objective of root canal treatment is to completely remove the infected tissue and seal the canal(s) with a biocompatible material. Completing the root canal procedure in a shorter time and at the same time providing good quality treatment is the choice of interest for most practitioners.<sup>6</sup>

Guidelines for the sequence of using rotary files in primary teeth have not been established. Potential limitation for its use in primary teeth is due to the morphology of the primary teeth. Primary teeth have softer root dentin, curved roots with undetectable root tip resorption and ribbon shaped root morphology. Hence, a modified sequence for rotary instrumentation of the primary root canals has to be established.<sup>7</sup> The present study was conducted to compare Kedo- S rotary file system, universal protaper and manual instrumentation in pediatric patients.

In present study, we included 20 patients in three groups. Group I root canals were instrumented with Kedo-S paediatric rotary files, group II with Protaper and group III with manual hand files. Moghaddam et al<sup>8</sup> in their study compared the quality of obturation and instrumentation

time during root canal preparation using hand files and modified rotary file systems in primary molars. Forty-five primary mandibular molars were randomly assigned to three experimental groups (n=15). Group I was instrumented using k-hand files, Group II with S2 ProTaper universal file and Group III with 0.25 tip 4% taper K3 rotary file. Standardized digital radiographs were taken before and after root canal instrumentation. Root canal preparation time was also recorded. No significant differences were noted with regard to the quality of obturation ( $p=0.791$ ). However, a statistically significant difference was noted in the instrumentation time between the three groups ( $p < 0.05$ ). ProTaper rotary system had significantly lesser instrumentation time when compared to that of K3 rotary system and hand file system.

We found that quality of obturation was under fill in 12% in group I, 13% in group II and 6% in group III, optimal 68% in group I, 60% in group II and 54% in group III, over fill 20% in group I, 27% in group II and 40% in group III. The difference was significant ( $P < 0.05$ ).

Vierya et al<sup>9</sup> compared and evaluated the instrumentation time and quality of obturation between paediatric rotary file (Kedo-S) and manual instrumentation techniques in primary molars. Sixty primary mandibular molars were randomly divided into two groups: 30 were instrumented with paediatric rotary files Kedo-S (experimental group)

and 30 with hand K-files (control group). During the preparation of the primary root canals the instrumentation time was recorded in seconds. The quality of obturation was recorded as optimal, under filled or over filled using immediate post-operative radiographs. Results Mean instrumentation time with paediatric rotary files Kedo-S (78.53 s) was significantly less than K-files (95.46 s) ( $p < 0.05$ ). There was a significant improvement in the quality of obturation ( $p < 0.05$ ) with paediatric rotary files (Kedo-S).

We found that mean instrumentation time in group I was 45.8 seconds, in group II was 56.4 seconds and in group III was 65.2 seconds. The total length of Kedo- S files is 16 mm and the working area (cutting flutes) 12 mm in length. The uniqueness of these files is the presence of variable taper (4–8%) with varying tip diameter D1-0.25, E1-0.30 and U1-0.40 corresponding to its use in primary teeth. D1 Kedo-S file is designed to prepare the narrower canals of the primary teeth namely the mesiobuccal and mesiolingual canals and E1 Kedo-S file is to prepare the wider canals namely the distal and palatal canals of the primary molar teeth.<sup>10</sup> A well cooperation was found with the use of Kedo-S files. Since there was less working time with this file system.

## CONCLUSION

Authors found that Kedo- S files were better in terms of instrumentation time and obturation as compared to protaper and manual files in children.

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