International Journal of Applied Dental Sciences 2019; 5(3): 391-393

ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2019; 5(3): 391-393

www.oraljournal.com
Received: 16-05-2019
Accepted: 20-06-2019

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Kedo-SG pediatric rotary files: A boon for rotary endodontics in primary teeth

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Abstract
Endodontic treatment of primary teeth poses a special challenge to the pediatric dentist. Although the conventional hand instrumentation technique remains the gold standard for root canal preparation, it results in more fatigue to the clinician as well as patient as it consumes more time. Recently, nickel titanium (Ni-Ti) rotary files have been introduced for use during pulpectomy in primary teeth. Rotary instrumentation in pediatric endodontics results in better, more predictable and uniform root canal filling. This paper presents case report of pulpectomy treatment performed with exclusively pediatric Ni-Ti rotary files "Kedo-SG".

Keywords: Endodontic, nickel-titanium, rotary, pulpectomy

Introduction
Pulp necrosis of primary molars and their subsequent loss stands as one of the most significant concerns in pediatric dentistry. Pulpectomy is the treatment of choice in such primary teeth with severe pulpal involvement. The primary goals while root canal preparation is to remove bacteria containing tissue, provide access to the apical third for proper irrigation and subsequent root canal filling [1]. The major challenges encountered during pulpectomy are the difficulty in negotiation and instrumentation of tortuous canals in roots with ongoing physiological resorption [2]. Pulpectomy in primary teeth should follow the objectives of fast procedure, short treatment duration, effective debridement of root canal without weakening tooth structure and harming the succedaneums tooth germ and maintaining the functional tooth till its natural exfoliation [3].

Conventional hand instrumentation techniques for canal preparation using files, reamers etc are time consuming and may lead to iatrogenic errors like ledging, zipping, apical blockage etc. The use of Ni-Ti rotary instruments have been reported to create smooth and predetermined funnel shaped canals while minimizing the above said complications.[4] The high flexibility of such files results in maintenance of original root canal curvature, especially in curved canals.[5] More recently introduced exclusively pediatric rotary Ni-Ti files serve to be cost effective and results in faster treatment and uniform and predictable root canal fillings.

This article discusses a case report of pulpectomy performed in primary molar using Kedo-SG an exclusive pediatric rotary files.

Case report
A 5-year old male patient accompanied by his parents reported to the Department of Pediatric & Preventive Dentistry with the chief complaint of severe pain in lower left back tooth region since 3 days. Pain was sharp, localized and present during night. His medical history was found to be non significant. Clinical examination illustrated extensive deep caries in the left mandibular deciduous second molar along with tenderness on percussion. Sinus tract or swelling was not evident. Intra oral periapical radiograph revealed radiolucency involving pulp chamber of the involved tooth [Figure 1]. Based on clinical and radiographic interpretation, the case was diagnosed to be of acute irreversible pulpitis. Pulpectomy on left mandibular second primary molar was planned as therapeutic procedure.

The child's parents were informed about the treatment plan, its advantage and shortcomings, other treatment alternatives and consequences if treatment was avoided. After proper isolation of teeth under rubber dam and with the use of saliva ejector, the tooth was anaesthetized using

2% lidocaine with 1:80000 adrenaline. Caries were removed and endodontic access opening was prepared with No 330 bur using high speed hand piece with water spray. Following this, coronal pulp was removed with a sterile spoon excavator and pulp chamber was rinsed with normal saline. The mesiobuccal and distobuccal canals were explored with size 10 K file and the distobuccal and distolingual canals were explored with size 15 K file. Working length was determined using preoperative IOPA and measured 1 mm short of the apex.

Root canals were then prepared with Kedo-SG rotary files (Reeganz dental care Pvt. Ltd., India) [Figure 2] using crown down technique. Both the mesial canals were prepared with D1 rotary file and distal canals with E1 file accompanied by irrigation with normal saline. 17% EDTA gel (Prep canal, Ammdent, India) was used as lubricant during canal preparation. The root canal obturation was done with metapex (Meta Biomed Co. Ltd., Korea). The immediate postoperative IOPA revealed optimal root canal filling [Figure 3]. The coronal seal was obtained with glass ionomer cement [Ketac Molar, 3M, ESPE, Minnesota, USA]. Finally stainless steel crown was cemented over the treated tooth. Patient was recalled after 6 months and tooth was found to be functional with no signs and symptoms both clinically and radiologically and physiological root resorption was found to be proceeding normally.

Fig 1: Pre-operative

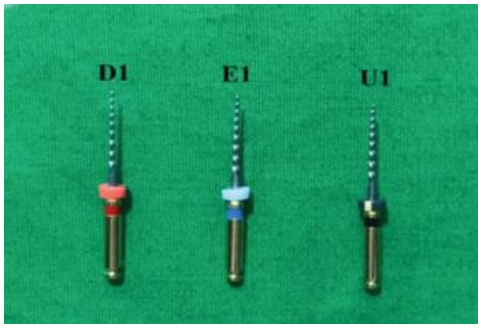

Fig 2: Kedo-SG pediatric Ni-Ti rotary files

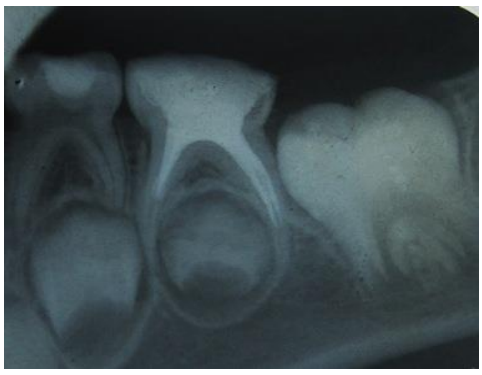

Fig 3: Post-operative

Discussion

Endodontic treatment of primary teeth has always been a challenging task for the clinician. Bacteria is the main etiological agent in the initiation and progression of pulpal and periapical diseases [6]. Pulpectomy is the treatment of choice for pulpally involved primary teeth. The bizarre root canal morphology and tortuous root canals along with physiological resorption are the major obstacles during biomechanical preparation in such teeth. Canal preparation can be done by hand instruments like files, reamers, drills etc. or rotary file systems. Hand instrumentation techniques are more time consuming and result in iatrogenic errors.

Barr *et al.* first demonstrated biomechanical preparation of primary teeth using Ni-Ti rotary files [7]. They concluded that root canal preparation using Ni-Ti rotary files was cost effective, less time consuming and resulted in predictable and uniform fillings. Recently introduced Kedo- SG rotary files has been designed specifically for use in primary teeth. This file system comprises of three Ni-Ti rotary files named s D1, E1 and U1. The total file length is 16mm and working length of file is 12 mm along with variable taper corresponding to the diameter of primary root canals.[8] D1 file has a tip diameter of 0.25 mm and are to be used in primary molars with narrow canals (mesial canals in mandibular molars and disto buccal and mesio buccal canals in maxillary molars). E1 file has a tip diameter of 0.30 mm and can be used in wider molar canals (distal canal in mandibular molars and palatal canal in maxillary molars). U1 has a tip diameter of 0.40 mm and used in primary incisor teeth. The recommended rotation speed is 150-300 rpm.

Primary teeth have curved, thinner, shorter roots and ribbon shaped canals which hampers the use of rotary files designed for permanent teeth [9]. The Kedo-SG pediatric rotary files have gradual taper and hence avoids over instrumentation of inner walls of root surface. It preserves the original anatomy of root canals [10]. It takes approximately 2-3 minutes for canal preparation using these files and thus, reduces the patient and operator fatigue.

Conclusion

The Kedo-SG rotary file system is considered to be an effective tool to debride the tortuous and bizarre canals of primary teeth. It helps the clinician to perform the procedure relatively faster and renders better quality of treatment. Hence the use of Kedo-SG rotary files is recommended for pulpectomy in primary teeth.

Conflict of Interests

The author declares no conflict of interests.

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