

**Ministry of Higher Education
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**Comparison of the Time, Cleaning Efficacy and
Obturation Quality between Rotary and Manual
Instrumentation Techniques in Primary Teeth
(An in vitro Study)**

A Thesis

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Abstract

Background: Endodontic treatment in the primary teeth is a challenging and time consuming, especially during canal preparation, which is considered as a one of the most important steps in the root canal therapy. Pulpectomy has been the treatment of choice in most of the necrotic primary teeth. Advancing technology has brought the rotary system to improve the manual dexterity, the quality of treatment for pulpectomy and better treatment protocol.

Aims of the study: The aims of this study were to compare the instrumentation time, cleaning efficacy and obturation quality of manual instrumentation and rotary systems in the preparation of the root canals of the primary molars.

Materials and methods: Sixty root canals (distal root of mandibular molars and palatal root of maxillary molars) related to primary teeth were selected. These 60 canals were divided into two groups: group (A): (n = 30 canals) to evaluate the cleaning efficacy and the time required for the instrumentation. Group (B) :(n =30 canals) to evaluate the obturation quality of the root canals. These teeth submitted to sterilization and access opening. In group A all canals filled with India ink by insulin syringe, after 48 hours, the teeth were randomly divided into 2 subgroups: subgroup I (n=15): The root canals were prepared manually using stainless steel files. Subgroup II (n=15): The root canals were prepared with rotary 2-shape system. The total instrumentation time were measured by using a digital stopwatch. After that, the roots were sectioned by disk bur. Then, the specimens were photographed with a digital camera. The images were analyzed according to scores. Group (B): (n=30 canals) randomly divided into 2 subgroups as that in group A. After complete the instrumentation, the root canals of all the samples were obturated using calcium hydroxide paste. To evaluate the obturation quality,

radiographs were taken. The assessment of the quality of the filled root canals, was done according to distance of the filling material from the apex.

Results: The cleaning efficacy was compared at the coronal, middle and apical level. In the coronal third, rotary 2- shape system showed more removal to the ink than the K-file with statistical significant difference ($p < 0.05$), however, for the middle third of the canal, no statistical difference was found between the two systems ($p = 0.05$). While at the apical level, K-file showed more removal to the ink than the rotary two shape system with a statistical significant difference ($p < 0.05$). Evaluation of the total samples revealed no statistical significant difference concerning the efficacy of cleaning between the K-files and rotary two shape system files. The group that was rotary prepared took less time for the canal preparation as compared to the manual group (80.063 sec., 144.576 sec. respectively). Concerning the obturation quality, results showed that the mean rank was more among the rotary group than in the manual group while the median appear to be equal but all these findings with statistically not significant ($p > 0.05$).

Conclusion: No significant difference was found between the two systems concerning the cleaning efficacy (for the total canal) and obturation quality. Instrumentation done by the rotary system took significantly less time than that of the manual.