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RESEARCH ARTICLE

MANAGEMENT OF MAXILLARY FIRST MOLAR USING NEXT GENERATION NITI SYSTEM-THE HYFLEX EDM

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ABSTRACT

This is a clinical case of a maxillary right first molar with four root canals using a hyflex edm rotary file system. A successful endodontic treatment of a tooth depends on shaping, cleaning and filling of the canal system.With the innovative mechanism of HyFlex EDM files which are produced using process called Electrical Discharge Machining. The EDM process results in a file that is extremely flexible and fracture resistant. In fact, HyFlex EDM files are up to 700% more resistant to cyclic fatigue compared to traditional NiTi files

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INTRODUCTION

For the successful endodontic therapy, the knowledge of the pulp anatomy and its variations should be carefully ruled out from the normal. Before initiating the endodontic therapy, a clinician should have a thorough knowledge of the pulp anatomy. In addition to general morphology, variations should be always kept in mind while performing the root canal therapy (Gusiyska *et al.,* 2009). Weine *et al.* observed that failures related to the mesiobuccal root of maxillary molars expose to danger the success of endodontic therapy and found that teeth with a fourth canal occurred more frequently that those with three canals (51,5% versus 48,5%). Hession compared the canal morphology before and after instrumentation and concluded that the number of canal usually equals the number of roots. The greatest variations observed were the presence of two canals in the mesiobuccal root of maxillary molars, canals in the furcation area and presence of lateral and accessory canals (Favieri *et al.,* 2006).

CASE REPORT

A 26 year-old male reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of pain in the upper right back tooth region since 15 days. Pulp Vitality test indicated pulp necrosis. The preoperative periapical radiograph showed a small area of thickened periodontal ligament around the root apices and radiolucency extending towards the pulp with possibility for additional canal in MB root (Fig.1). A complete case history was taken from the patient followed by medical and dental history. Then a, standard endodontic procedure was carried out after administration of local anesthesia. A rubber dam was placed for conservative endodontic access and the pulp chamber was exposed clearly. Examination of the pulp floor with an endodontic explorer revealed 4 distinct canals-MB1, MB2 DB, and P canal. K-type flexofile were used for gross removal of pulp tissue in the four main canals with exploration of groove around MB2 orifice, approximately 1.5mm in palatal direction. The conventional triangular access was modified to a trapezoidal shape to improve access to the additional canals. All canals were easily negotiated, and were chemo mechanically prepared by crown-down technique with 5.25% NaOCl, 17% EDTA and saline as irrigating solution. After exploring the 4 canals with #06, #08, #10 C-files root canal access were prepared with #1, #2 and #3 RGG The working length was determinate by using apex locatorP=21mm, DB=22,5 mm, MB1=21mm, MB2=20mm respectively. Apical preparation of the 2 mesiobuccal canals

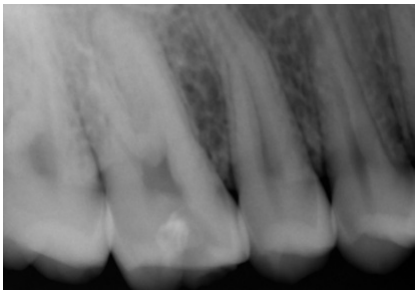

Fig.1. Preoperative radiograph

Fig. 2. Working length determination

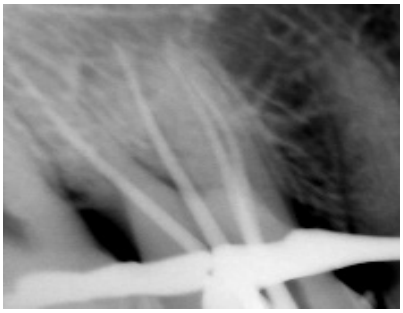

Fig. 3. Master cone

Fig. 4.Post endodontic restoration

was completed after instrumentation with HYFLEX EDM. Prepared canals were obturated using the lateral condensation technique and MTA Fillapex as a sealer (Fig. 2, 3, 4).

DISCUSSION

A number of anatomical variations have been described in respect to maxillary first molar. The present case report describes a four-rooted maxillary first molar with two mesial and one distal, one palatal root roots in which each of the four roots have an independent root canal. The instrumentation of these canals was carried out with HYFLEX EDM files which are up to 700% more resistant to cyclic fatigue compared to traditional NiTi files. The HyFlex EDM owes its unique properties to a breakthrough technology called "Electrical Discharge Machining". This innovative manufacturing process uses spark erosion to harden the surface of the NiTi file, resulting in superior fracture resistance and improved cutting efficiency. The built-in shape memory of HyFlex EDM files prevents stress during canal preparation by changing their spiral shape. A normal autoclaving process is enough to return the files to their original shape and fatigue resistance. HyFlex EDM files follow the anatomy of the canal, which can significantly reduce the risk of ledging, transportation and perforation.

The combination of flexibility, fracture resistance and cutting efficiency of the HyFlex EDM make it possible to reduce the number of files required for cleaning while preserving anatomy. Provided as a modular system of sterile instruments, HyFlex EDM includes Shaping, Glidepath, OneFile, Orifice Opener and Finishing files.

Conclusion

Since with the innovation of new research and technology in the field of endodontics, practitioners can more efficiently retain the natural teeth for a lifetime.

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