Original Research Article

ROOT CANAL TREATMENT OF MANDIBULAR FIRST MOLAR WITH CONSTRICTED CURVED ROOTS USING HYFLEX EDM: A CASE REPORT

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Abstract

This case demonstrate passage therapy of 4 -canal mandibular first molar. Acute exacerbation was noted on previous intervention. Four canals (mesio buccal, mesio lingual, disto buccal, disto lingual) were identified. Clinician must be aware of the variations within the passageway anatomy of first molar. During clinical examination, the dental practitioner should identify the extension of decay and possibility for restoration, mouth opening and accessibility and future involvement as a functional component in an exceedingly proposed treatment plan. Every clinician should know abount the root anatomy and curvature of the canal before proceeding to the endodontic treatment. The mandibular first molar is the most imporatant and functional tooth of the mandibular arch, so conservation of this tooth is very necessary in dental practice.

Keywords: Endodontic treatment, first molar, curved roots

I. Introduction

Despite the academic efforts and oral hygiene programs organized by many dental ssociations to enhance the oral and dental health, mandibular first molar teeth always are vulnerable to decay because their most early eruption in the oral cavity, plaque accumulation and obscure the correct access to the tooth surface for optimum cleaning. Apart from that, they sometimes appear within the mouth with abnormal eruption patterns, which also make them more vulnerable to dental decay, still as gingival and periodontal diseases. More over as this tooth erupts early in the oral cavity negligence to cleaning & oral hygine leads to the decay of the first molar early.

Minimum intervention with retaining the every functional component of the dental arch, including first molars, are the principle goals of up to date practice. In some clinical situations, the retention of first molar would be essential if the tooth is functional and/or would function a convenient abutment for future fixed or removable prosthetic restoration. As such, first molar teeth scheduled for endodontic therapy should be treated thoroughly to ensure the complete elimination of the inflamed dental pulp (radicular and apical) and the microbial invasion of root canal system that, if left, would impair the clinical outcomes of the proposed treatmet plan.

Before commencing endodontic treatment in first molar teeth, a meticulous understanding of their root and passage anatomical variations and their endodontic implications is of prime importance. during this article, the external and internal radicular anatomical variations reported in previous laboratory findings and clinical investigations are discussed. additionally, the treatment strategies and recommended guidelines that ought to be followed during endodontic treatment of first molars are described.[1,2]

Case Report :

A 23 -years old female patient presented with the history of pain in mandibular left posterior tooth region. Pre-operative radiograph demonstrated carious exposue with pulp involvement. Digagnosis was made by clinical symptoms & pre operative radiograph. The radiograph showed thickening of the the lamina dura & presence of periapical radiolucency (Fig 1). Provisional diagnosis was chronic irreversible pulpitis with symptomatic apical periodontitis. Treatment plan was Root Canal treatment followed by crown w.r.t 36.

Figure 1: Pre-operative radiograph

Access opening was done under local anaethesia. On access, four canals were identified (mesio-buccal, mesio-lingual, disto-buccal & disto-lingual). Copious irrigation with bleaching agent and saline was done and canals were cleaned with 5.25% sodium hypochlorite and saline. a mix of electronic apex locator (Dentsply) and periapical radiographs were wont to estimate working lengths (Fig 2). The Master apical file size was an Hyflex #25 taper .06.

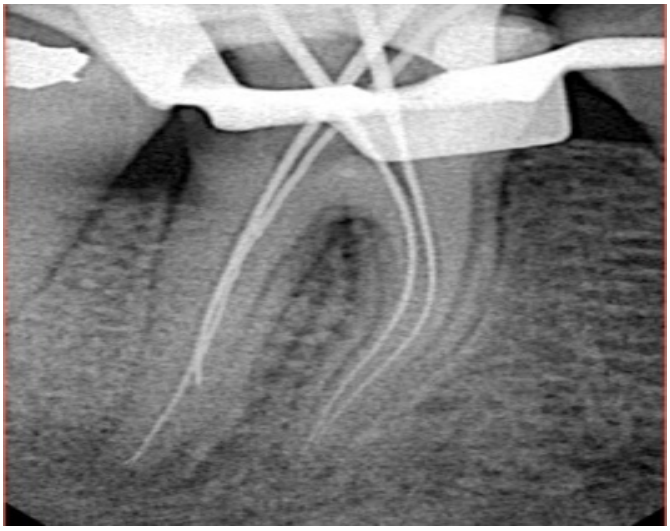

Figure 2: Working Length

Copious irrigation with 5% sodium hypochlorite was performed during biomechanical preparation that is cleaning & shaping of the root canal. Patient was medicated with proper antibiotics and analgesics. On subsequent appointment, the four canals again, BMP was done using glyde (Densply) as a chelating agent and irrigation was conducted using sodium hypochlorite 3% and normal saline. Chlorhexidine 2% was used as a final rinse to disinfect the canals. Master cone was fitted into the canals corresponding working lengths (Fig 3). Canals were dried with paper points, coated with selapex sealer (Kerr) and obturated using single cone gutta percha technique. After endodontic treatment the tooth was restored with tetric n ceran bulk fill composite, which was clinically adequate. (Fig 4)[3,4]

Figure 3: Master cone

Figure 4: Post obturation radiograph

Discussion:

The mandibular first molar seems to be the tooth that almost all often requires an endodontic procedure (vital pulp capping, pulpotomy, passageway therapy); therefore, its morphology has received a good deal of attention. The occlusal appearance reflects a Y5 groove and cuspal pattern and therefore the tooth usually has two roots, but occasionally it's three, with two or three canals within the mesial root and one, two, or three canals within the distal root.[5] First molar teeth are subject to many dental complications because of their most early eruption and insufficient cleaning. Owing to poor oral hygine this tooth is very prone to decay from the teen ages. Despite being a common dental procedure, minimum intervention and retaining every functional component of the dental arch with this most vital tooth of mandibular arch which is the prime tooth for mastication are of prime importance in contemporary dental practice.

According to Grossman first molar has two well differentiated roots, one mesial and one distal. Both roots are wide and flat buccolingually, with a depression in the middle of the root buccolingually. A third root is found in some cases either distally or mesially and is often referred to as radix entomolaris. Mesial root has two canals that exit two foramina in 41% of cases, two canals that coalesce to exit in one foramen in 28% cases, two canals that coalesce to form one canal that bifurcate and exit in two foramina in 13% cases, one canal that exits in one foramen in 12% cases, one canal that bifurcates and exists in two foramina in 8 % cases and in rare cases three canals exit in three foramina. In distal root one canal exiting in one foramen in 70% of cases, two canals coalescing and exiting in one foramen in 15 % of cases, one canal bifurcating and exiting in two foramina in 8% of cases and two canal exiting in two foramina in 5% of cases.[6]

As this is the most functional tooth in the dental arch retention of this tooth is very necessary and it can be used as abutment of fixed partial denture prosthesis. For proper endodontic treatment of this mandibular first molar, care & patience is the foremost criteria to serve a truthful treatment outcome. In this case the mesial root has two slender, constricted and curved root canals. For his small number k file is used to negotiate the canals and adequate chelating agent was used to make the canal patent for BMP. Moreover the canals were curved so that pre curving of the hand files are necessary in such cases to avoid instrument separation.

Conclusion:

Mandibular first molar is the most active and bulky tooth of the mandibular arch and it erupts early, so proper oral hygine is needed to avoid dental decay. If the tooth become carious then restoration of the tooth is the prime concern. Endodontic treatment is indicated when the patient is symptomatic and pulp involvement occurs. Every clinician should know the anatomy, position and the variation of the canal anatomy of the mandibular first molar before commencing the endodontic treatment. Proper skill and patience is needed for doing the endodontic treatment. Following the basic principles and taking advantage of new innovations (usage of intermediate precurved sequential filing and flexible rotary systems) in the field of rotary endodontics, even most severely curved canals can be negotiated and treated successfully as in the present case with the help of flexible rotary file system Hyflex Edm.

References :

1. Woelfel JB, Scheid RC. Dental anatomy Its relevance to dentistry. 6th ed. Philadelphia: Lippincott Williams and Wilkins, 2002, 178-220.

2. Westesson PL, Carlsson LE. Anatomy of mandibular first molars. A comparison between Radiographic appearance and clinical observations. Oral Surg Oral Med Oral Pathol. 1980; 49:90-4.
3. Sidow SJ, West LA, Liewehr FR, Loushine RJ. Root canal morphology of human maxillary and mandibular first molars. J Endod. 2000; 26:675-8.
4. Hany Mohamed Aly Ahmed. Management of third molarm from endodontic perspective EJDG. 2012; 1(4):48-60.
5. Cohen's pathway of dental pulp (10th edition), 2011.
6. Grossman's endodontic practice (13th edition), 2014.