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RESEARCH ARTICLE

APICAL THIRD TRIFURCATION OF MANDIBULAR FIRST PREMOLAR: A CASE REPORT

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ABSTRACT

Mandibular premolars have always been considered as an "enigma to endodontist". The numerous variation in anatomy of roots and canals are challenging to treat them endodontically. This is a case report presenting with the treatment of trifurcation of mandibular first premolar in the apical third.

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INTRODUCTION

Tooth anatomy is the blue print on which every clinician relies upon prior to initiate a root canal treatment. Mandibular premolars are the most challenging teeth to be treated endodontically (Kottoor, 2013). Their anomalous variations, narrow mesiodistal dimensions, narrow access to canals, lack of visibility, and apical third trifurcations and deltas are factors that further compounds the difficulty for clinicians (Albuquerque, 2014). This case report present a mandibular premolar with trifurcation in the apical third each with separate apical foramen.

CASE REPORT

A 52 year old male patient presented to department of Endodontics, with chief complaint of pain in his left lower back tooth since 1 month. Clinically there was caries approaching pulp, in relation to 34. The tooth was tender to percussion. Pre-operative radiograph revealed periodontal ligament widening and periapical lesion measuring 1×1 cm in relation to 34. The provisional diagnosis was chronic irreversible pulpitis with chronic apical periodontitis. Patient's medical history was non contributory and non surgical endodontic treatment was planned.

Local anaesthesia of 2% lignocaine with 1: 50,000 epinephrine was administrated. Rubber dam (Hygenic, Coltene) was placed. Acess opening was done with Endo Access Bur. An ovoid shaped opening was seen at the centre. No 10 file was inserted which showed trifurcation at the apical third of 34. Working length were estimated using apex locator (Root Z apex mini, Morita, Japan)and confirmed with radiograph (Figure 1) Further hand filing was done upto 20 size K file and rotary instrument (hyflex CM NiTi, Coltene) 4% 25. Copious irrigation of 5.25 % sodium hypochlorite, 2% chlorhexididne, 17% EDTA and saline with endovac (Kerr dental).After preparation root canals were inserted with gutta-percha cones to reconfirm the working length (Figure 2) The cone was cut above the trifurcation with heated plugger. Canal was backfilled with thermo plasticiced gutta percha (Obtura III). Composite (3M ESPE Filtek Z250) was given as a permanent restoration (Figure 3) Patient experienced no post treatment pain or discomfort. A 2 year follow up has shown a healing lesion Figure 4.

DISCUSSION

Canal anatomy is very much unpredictable. Thorough cleaning and shaping of the canal space and complete filling with an inert filling material is necessary for success of endodontic treatment.

Figure 1. Working length determination

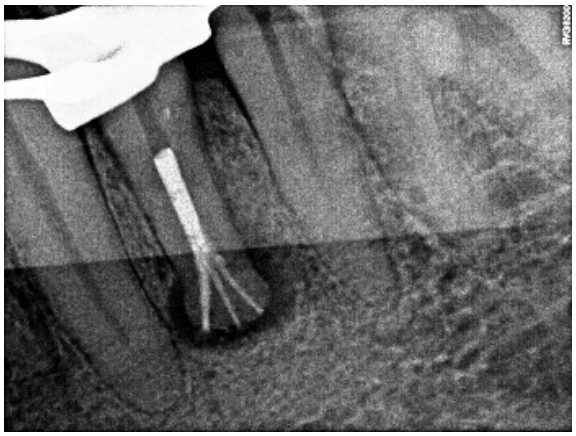

Figure 2. Working length determination trifurcation filled with gp cone and obtura III

Figure 3. Post endo radiograph

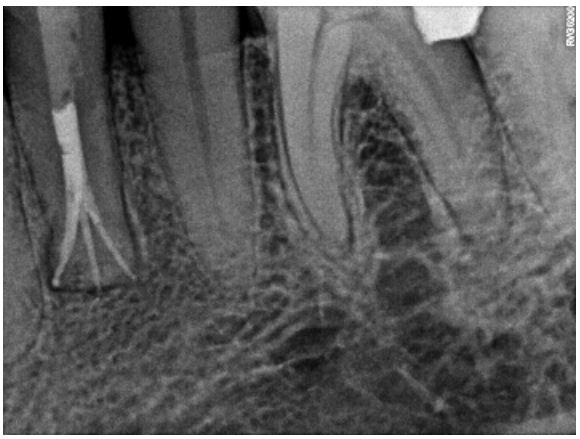

Figure 4. 2 year review

According to Hess wide variation and complexity of root canal system establishing a root with a tapering canal and a single foramen was an exception rather than a rule (Izaz, 2018) Special consideration should be given for the evidence of occurrence of anatomic variation throughout the procedure (Sonarkar, 2018; Shenoy *et al.,* 2013). Various factors like ethnic back ground, age and gender influence the variation in root canal anatomy of permanent teeth (Almeida-gomes, 2006). A systemic review by Kottoor *et al.* stated that Caucasian, Indian and Middle Eastern population showed higher prevelance of multiple canals (14% - 17%) (Kottoor, 2013). Vertucci reported that mandibular premolars have Type I canal in 70 % cases, Type II in 4 % cases, Type III canal in 1.5 % cases and Type IV canals in 24% cases (Cleghorn, 2007). Hence thorough assessment of radiographs should be done. Decisive step in finding the split canal was tactile examination of main canal with a small precurved K- file. After locating canal widening is done in sequence (Hemanth, 2017). Obturating such canal is also another challenge. Various attempts have made use of CBCT image for confirmatory diagnosis of morphologic abberations in endodontic field (Jha, 2013).

Conclusion

Clinician should be aware in the variations in anatomic configurations and types in mandibular premolars. Tactile examination is the key step in locating these apical splits. Microscopes can be used as an adjunct to locate these canals. A three dimensional obturation fills the canal.

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