

Endodontic management of a hidden middle distal canal in mandibular first molar with post-operative CBCT. -A Case Report.

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Abstract

The main objective of root canal treatment is thorough mechanical and chemical cleansing of the entire pulp space and its complete filling with an inert filling material. To be able to precisely detect, search, and decontaminate root canal system, cone-beam computed tomography (CBCT) can be used to aid in diagnosis of root canal morphology. Treating extra canals may be challenging but the inability to find and properly treat root canals may cause failures. The present case report discuss the management of mandibular molars with middle distal canals

Introduction

The self-named success or the failure bankon with four main marks that includes clear understanding of the root canal anatomy and morphology of the entire root canal system, chemical cleansing & disinfection, three dimensional obturation and a sound restoration. Vertucci (1984) was first to propose a standardized method for categorizing root canal anatomical variations.(1) The incidence of three distal canals has been reported to be much lower at 0.6 %.(2) Neelakantan et al. 2010 (3) reported that CBCT has the ability to detect the root canal system as accurately as canal staining and clearing techniques, which was considered superior to many other techniques used. This case report is about endodontic management of a mandibular first molar having five root canals (two in mesial and three in distal root) having a Type XII (3-2) root canal pattern in the distal root (Gulabivala et al. 2001).(4)

Key Words

Mandibular molar, Middle distal, CBCT.

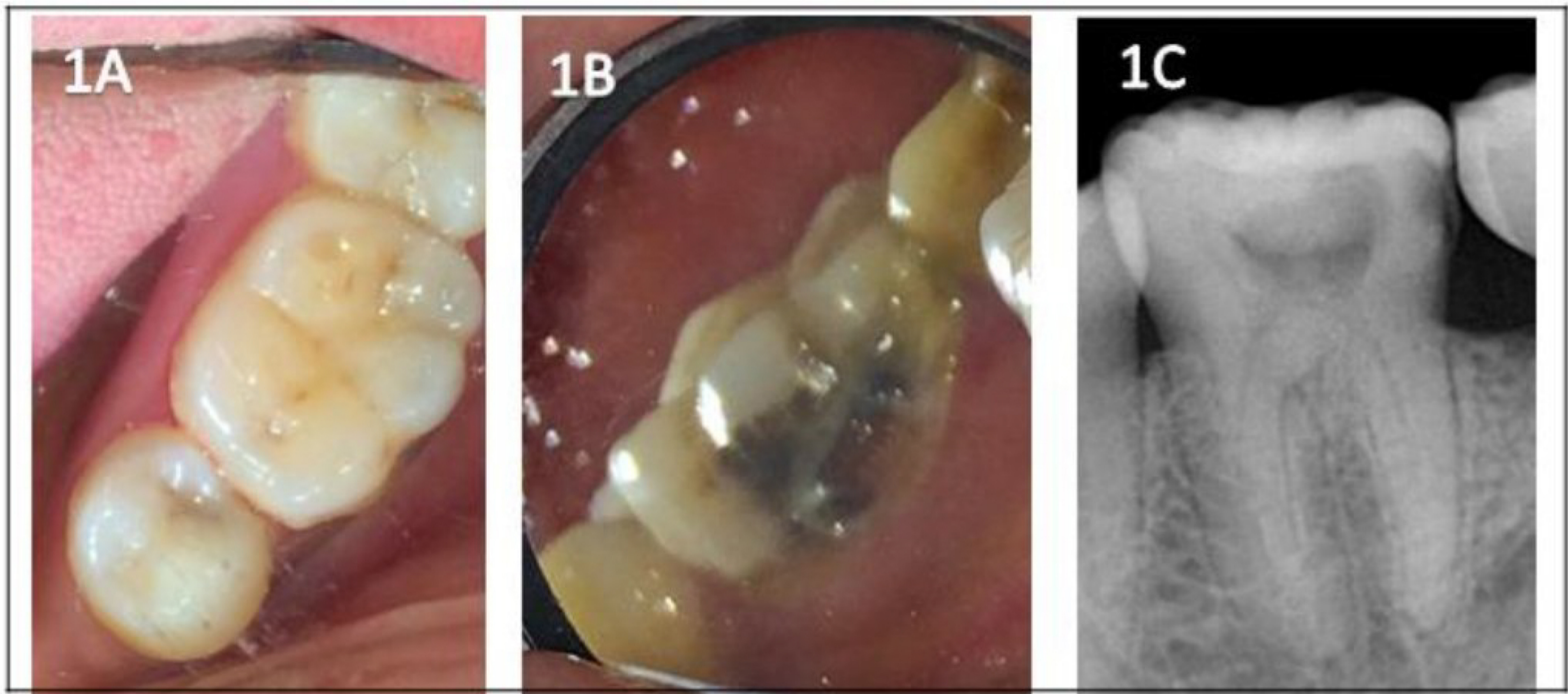
Case Report

A 30 year-old female patient was referred to the Department of Conservative Dentistry and Endodontic with a chief complaint of acute pain in her right lower back tooth. On clinical examination, there was gross decay in the mandibular right first permanent molar (46) (Fig.1A, 1B) which was tender to percussion. Pulp sensibility testing of the involved tooth with dry ice was done and it was non vital. The preoperative diagnostic radiograph revealed an occlusal radiolucency, approaching the pulp space with periodontal ligament space widening and loss of lamina dura in relation to 46 (Fig.1C). From the clinical and radiographic findings, a diagnosis of irreversible pulpitis with symptomatic apical periodontitis in 46, and root canal treatment was scheduled. Radiographic evaluation of the tooth indicated a normal root canal anatomy. After achieving proper anaesthesia access cavity was prepared under rubber dam isolation on tooth 46. After scouting the root canals, flaring of the coronal thirds was performed with a ProTaper SX rotary file (Dentsply Maillefer) in all four canals (mesiobuccal, mesiolingual, distobuccal and distolingual) (Fig. 2C). The working length was determined using electronic apex locator (propex pixiTM DENTSPLY) and confirmed radiographically (Fig. 2A). During the initial working length radiograph a third distal canal was appreciated (Fig. 2A). Under 3.5x magnification access cavity was modified using long shaft round bur no 2 on the distal surface and third canal was located and Working length radiograph was established (Fig. 2B, 2D). Biomechanical preparation was done using Protaper rotary file according to the manufacturer instructions under abundant irrigation with 0.9% normal saline, 5.25% sodium hypochlorite and 17% EDTA after the use of each instrument. Canals were then dried with absorbent points and filled with warm vertical compaction technique using AH-Plus sealer (Fig.

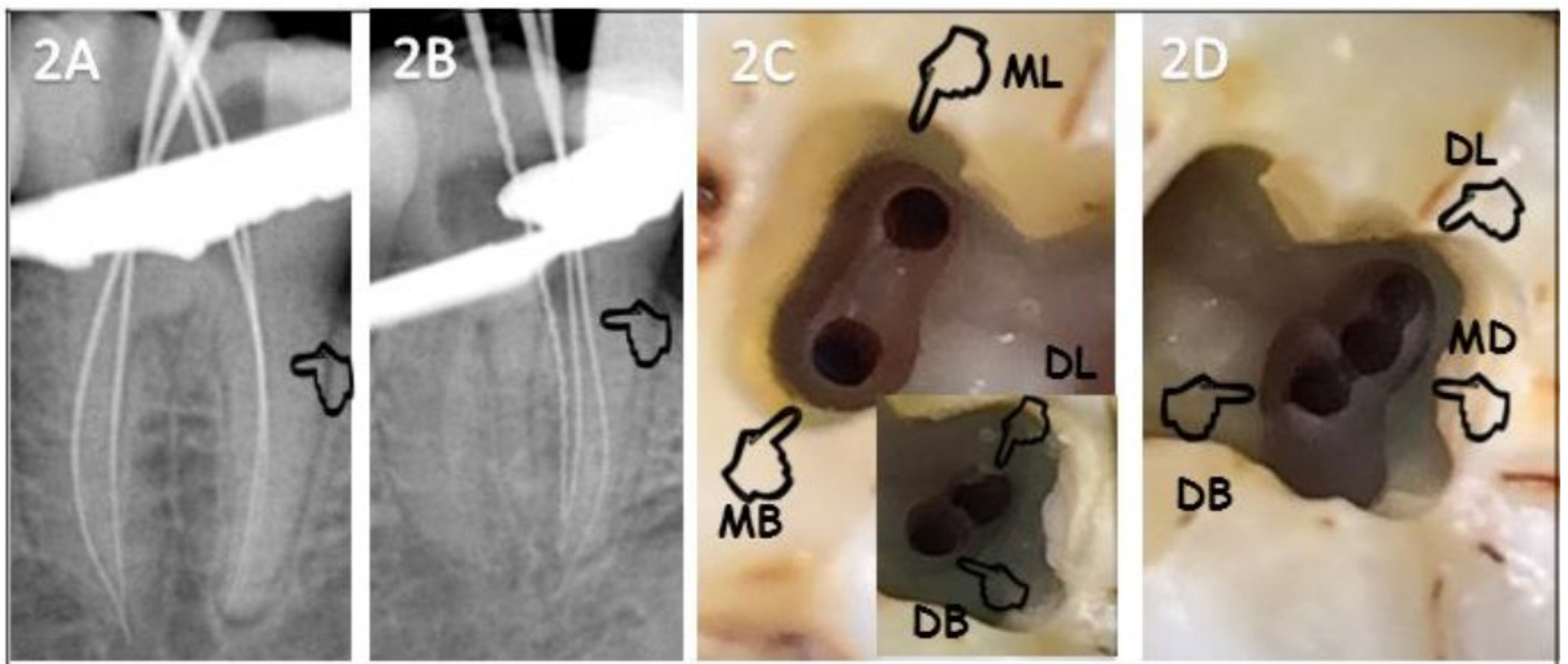
3A, 3B). Tooth was then restored with amalgam and post-operative peri-apical radiograph was obtained (Fig. 3C). CBCT was advised confirming the obturation in all the five canals three dimensionally (Fig. 4A, 4B). PFM crown was placed after 15days (Fig. 4C).

Discussion

Human tooth morphology exists with complicated and diverse root canal system poses a challenge to successful diagnosis and treatment. Incidence of three canals in distal root of mandibular first molar in an Indian population is 1.7%; 0.2% in Senegalese population; 1.7% in Turkish population; 0.7% in Burmese population; 1.6% in Thai population; and, in Sudanese population 3% (5). It has been postulated that secondary dentin apposition during tooth maturation would form dentinal vertical partitions inside the root canal cavity, creating canals.(6) A thorough understanding of tooth morphology (Burns & Herbranson 2002), angulated radiographs (Fava & Dummer 1997), CBCT (Gopikrishna et al.) where in three dimensional radiography was used for the confirmatory diagnosis of morphological aberrations in the root canal anatomy and exploring the root canal under the surgical operating microscope, are the are essential prerequisites for a successful treatment outcome.(7)



(Fig. 1A) Intraoral occlusal view, (Fig. 1B), Intra oral Buccal view, (Fig. 1C) Pre-operative radiograph.



(Fig. 2A, 2B) Working length radiograph, (Fig. 2C,) Four canal orifices (mesiobuccal, mesiolingual, distobuccal and distolingual), (Fig. 2D) Three distal orifices.



(Fig. 3A) Master cone radiograph, (Fig. 3B, 3C) Obturation radiograph with amalgam core.



(Fig. 4A, 4B) CBCT axial view, (Fig. 4C) Post-operative radiograph with crown.

Conclusion

Factors which influence the success of root canal treatment include thorough knowledge about the varied canal anatomy, effective diagnosis with the help of advance diagnostic tools, sound knowledge and techniques about chemical cleansing, disinfection, obturation and use of higher magnification. The assumption about the fixed number of root canals is now obscure so the boundness of the dentist to evaluate each case carefully would provide a better prognosis and longevity for endodontic therapy.

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