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The accidental discovery and management of extra root canal in a mandibular first molar: A case report

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Abstract

Chronic apical periodontitis can manifest itself in various forms ranging from intraoral or extraoral sinus drainage [1] to absolutely painless and no sinus but carious tooth. Though we have an inclination for single-sitting root canal treatment, we might need a multiple-sitting treatment in case there is an unusual finding like an extra root or an extra root canal. This case report shows the accidental finding of an extra canal in a patient who had complained of mild sensitivity in her tooth and its successful treatment with multiple visit root canal treatment.

Keywords: Tooth, Chronic, CBCT, Root canal

Introduction

Missing an extra canal or accidentally finding an extra root or root canal is not uncommon [2]. The success of root canal treatment depends heavily on this factor. Root canal treatment tends to fail even after all the efforts, this leads to suspicion of overlooking some lesser usual morphology and anatomy of a tooth as well as a root canal. [3]

Some extra root canals can be found during the access opening refinement [2] while performing the treatment, accidentally while taking a radiograph, or even sometimes when the patient complains of continued pain after a successful (at least we thought so!) root canal treatment. Sometimes the unordinary findings may require 3D radiographs like CBCT aid to successfully treat the condition. [4]

Also, proper irrigation concentration and volume help in reaching the apex to its full length which otherwise would be difficult to reach. This is one of the important aspects when suspecting away from the normal number of root canals for a successful endodontic treatment.

Case report

A 21-year-old female patient reported to our clinic with the chief complaint of mild sensitivity in her right posterior tooth. The patient gave a history of decay for the past 3-4 years but no need arose for taking any kind

of medication, no pain on mastication, only mild sensitivity for which she used desensitizing toothpaste. During the examination, the tooth was deeply carious; there was no tenderness on percussion and a negative response to heat and cold tests. On Roentgenic examination, there was a definite periapical radiolucency (Figure-1). Keeping these findings in mind, this tooth was diagnosed as a non-vital mandibular first molar with chronic apical periodontitis which called for Endodontic intervention.

Figure 1: Diagnostic radiograph

An inferior alveolar nerve block was given and endodontic treatment was initiated. No bleeding during access opening confirms the non-vitality of the tooth. Working length was determined using an apex locator and confirmed using an IOPA. The keen observation of IOPA revealed the presence of extra roots/root canals in the tooth. The extra root canal in the distal root was located during the refinement of the access opening. Co-relating with the Laws of symmetry in the dentinal map also suggested the presence of an extra canal in the distal root or the presence of an extra root. Unfortunately, the presence of radix entomolaris or radix paramolaris could not be confirmed using a CBCT as the patient was relatively asymptomatic and the canals could be negotiated with tactile sensation and IOPA. Now there was confirmation of the presence of a total of 4 root canal system in the tooth- mesiobuccal, distobuccal, mesiolingual, and distolingual. (Figure 2)

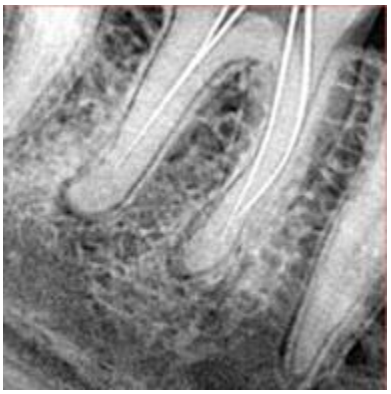

Figure 2: Presence of 4 root canals

Another challenge during the treatment was that none of the canals could be negotiated to their full length on the first attempt. (Figure 3. Figure 4, Figure 5) So careful usage of 17% EDTA gel along with irrigation using normal saline and 5.25% Sodium Hypochlorite solutions led to successful negotiation till the full length of the root canals. A complete negotiation of canals and the shaping and cleaning of the canals was done till 25/06 using hand files and rotary files along with intermittent irrigation. Care was taken that the irrigating solutions do not flare out of the tooth. This part of the procedure was completed in 2 visits. Calcium hydroxide dressing was placed in the canals in the interim period. The patient was recalled for obturation.

Figure 3: Incomplete negotiation of mesial canals

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Figure 4: Incomplete negotiation of distal canals

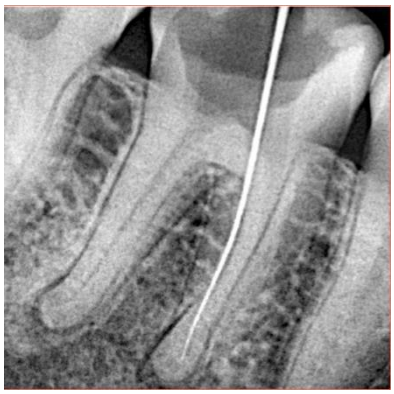

Figure 5: Incomplete negotiation of distal canals

During the appointment for obturation, the root canals were thoroughly irrigated and then dried using paper points. A confirmatory radiograph was taken to reconfirm the working length (master cone radiograph). The canals were then obturated one by one maintaining the isolated environment. A post-operative radiograph was taken. (Figure 6)

The patient was recalled for a follow-up and a radiograph was taken (Figure 7) which showed healing in process thereafter post root canal filling was done followed by a fixed prosthesis.

Identifying the extra canal can be done by using several aids like visual aids- loupes or microscopes [8] or simply observing bleeding points through the naked eyes [3]; tactile sensation; observing IOPA and taking IOPA in different angulations [3, 9]; using CBCT to study the tooth completely [10]. From here, starts the process of cleaning and debridement of the root canals.

Shaping and cleaning each root canal followed by an optimum amount of irrigation can help in the proper cleaning and disinfecting of the canal. [11, 12] This may require one to more dental appointments. And then final sealing of the root canal with GP cones and sealer i.e. establishing a coronal seal is equally important. Another vital aspect is to have a proper coronal seal too as a number of studies have stated that leakage from either apical or coronal direction adversely affects the success of endodontic treatment. [13]

Conclusion

Following rules of symmetry and a keen eye toward discovering an unusual finding in the normal anatomy and morphology of the tooth are key to the triumph of any endodontic treatment. The complex nature of the root canal system demands the usage of proper technique along with observational skills and knowledge of the operator which will open gates to explore the unexpected. Then finally applying the conventional technique and knowledge helps paving the way toward a pain-free tooth and successful treatment.

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