

Case Report

Endodontic Management of Mandibular first molar with 4 roots and 6 canals –A Case Report

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Abstract: Mandibular first molar usually has two roots, but, occasionally, it has three and rarely four, with two or three canals in the mesial root and one, two, or three canals in the distal roots. The anatomy of teeth is not always normal. A great number of variations could occur in formation, number of roots, and their shape. Abnormalities are rare, but it is possible that a patient referred may have one of these rare anatomic variations, Hence the clinician must have thorough knowledge and be cautious in treating them.

Keywords: Mandibular molar, Four roots, Six canals

INTRODUCTION

Successful root canal treatment process starts with understanding the morphology of the root canal. Hence every clinician should consider the anatomic variations in the process of diagnosis and treatment of the maxillary and mandibular molars[1]. Also a thorough radiographic examination, including preoperative radiographs, is essential for success in endodontic therapy. Anatomical variations are an acknowledged characteristic of mandibular permanent molars. Ingle et al. stated that one of the main reasons of endodontic failure is the incomplete obturation of the root canal system[2]. Hence, the correct location, biomechanic instrumentation and hermetic obturation of all canals are essential procedures. Fabra-Campos studied 145 mandibular first molars and found that 2.75% of the teeth had five canals[3]. This case report describes endodontic therapy on 4-rooted, 6-canaled mandibular first molar.

CASE REPORT

A 25 year old male patient came with a chief complaint of pain in the left mandibular first molar, since 3 months. The patient gave a history of spontaneous pain around the apical area of the tooth, as well as pain upon mastication. On clinical examination, the tooth had class 2 carious lesion and was sensitive to percussion. The patient's medical history revealed no problem. The radiograph revealed radiolucency in the

periapical area of the distal root and apparent widening of the periodontal ligament space of both the roots. Pre-operative radiograph did not show the presence of four roots in the tooth #36 (Figure 1). A diagnosis was made as chronic apical periodontitis due to pulpal necrosis of the lower left first molar tooth.



Fig-1: Pre-operative Radiograph.

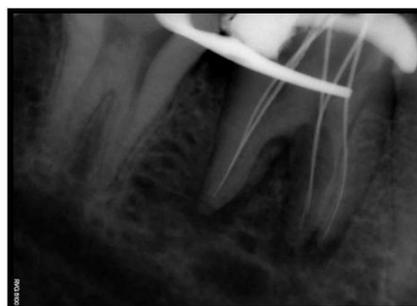


Fig-2: Working length Radiograph.

Conventional access cavity preparation was done under local anesthesia and rubber dam, which revealed 5 canals 3 mesial (mesio-buccal, middle-mesial and mesio-lingual) and 2 distal (disto-buccal and disto-lingual). The working length radiograph (Figure 2), which was mesially angulated showed 4 roots (2 mesial and 2 distal), which was confirmed using a Computer tomography of the tooth #36 (figure 3,4), revealed 4 roots and 6 canals. Therefore careful instrumentation was done to find the missing 6th canal which was located between the disto-buccal and disto-lingual canals (middle distal). Biomechanical preparation of the tooth was done using protaper rotary files (Dentsply Maillefer, Ballaigues, Switzerland) till #F₂ and obturated using lateral condensation technique using corresponding protaper G.P (Figure 5,6).



Fig-3

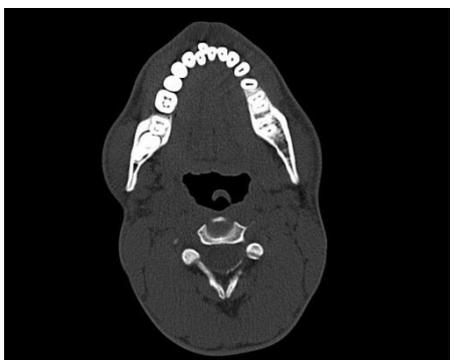


Fig-4

Fig-3 & 4: Computer tomograph images revealing 4 roots and 6 canals.

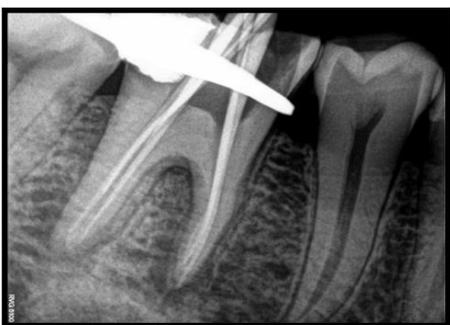


Fig-5: Master cones Radiograph.

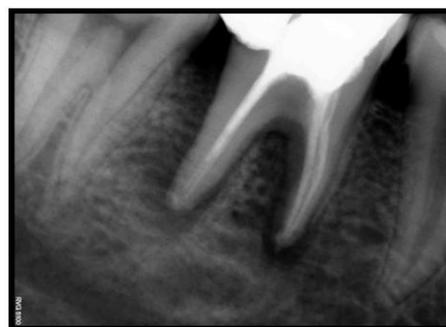


Fig-6: Post-operative Radiograph.

DISCUSSION

A mandibular first molar with more than four canals and 2 roots is an interesting example of anatomic variations[4]. Skidmore and Bjorndal in 1971 reported that about 88.8% of distal roots of the mandibular first molars have only one canal. The amounts vary from the maximum percentage of 56.7% that was reported by Wasti *et al.* Many researchers have studied the presence of two canals in the distal roots of mandibular first molars. The results differ from 43.3% to a minimum of 11.2% in Skidmore and Bjorndal's study[5]. Previous reports have described the mandibular first molar with three mesial canals and two distal canals, but few have reported a four rooted mandibular first molar with more than two distal canals.

CONCLUSION

Knowledge of both normal and abnormal anatomy of the molars dictates the parameters for execution of root canal therapy and can directly affect the probability of success. Hence clinicians must be familiar with all the molar abnormalities and make use of advanced equipments in diagnosing and treating them.

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