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A Case Report of Endodontic Treatment of a Mandibular First Molar with Unusual length of Root Canal Systems

Open Access **Case Report**

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Abstract

The main object of performing a root canal treatment is to facilitate the complete debridement from all the bacteria and infections followed by the obturation process in order to achieve periapical healing. In some situation, this process becomes complicated due to the presence of some obstacles, such as abnormal length of the root. In this reported article, the purpose is to show a successful non-surgical root canal treatment of a mandibular first molar with unusual working lengths. The post-treatment radiographs show successful obturation to the optimum length in all canals. This case report highlights the importance of applying knowledge and in the management of abnormal anatomic variation in which it plays an essential role in the success of the endodontic treatment outcome.

Background

The purpose of doing root canal treatment is to establish an entire pulpal space that is free from any pathos is by applying a chemo-mechanical preparation in the pulpal space followed by a biocompatible filling material *[1]*. Many obstacles can render the success of the treatment or make it very hard to achieve the optimum treatment. For example, presence of variation of morphology, such as multiple roots and accessory canals, dense in dent, taurodontism, and radix entomolaris and extreme long roots *[2]*. Radiculomegaly can be defined as extreme or very long and large roots *[3]*. It was first reported by Weine, followed by Wilkie and Chambers, and lastly by Gorlinet *[4-6]*. This phenomena makes the treatment highly difficult according to the endodontic case difficulty assessment form and guideline that was established by American Association of Endodontists *[7,8]*. Variant studies have been conducted on mandibular first molars in different populations regarding their different anatomy and configuration *[9]*. Recently, the number of reported cases is increasing in relation to the aberrant root canal morphologies; therefore, it is crucial to keep the clinicians up to date with the recent reported cases regarding such variation *[10]*.

Case Report

A 43 years old Saudi medically fit female came to King Saud bin Abdulaziz for health science dental college regarding a previously initiated treatment in the emergency department of tooth #46 three days ago that sought further endodontic treatment. Figures 1 illustrate the patient panoramic x-ray that was taken two years ago. This OPG shows radiculomegaly in most of her teeth specifically the posteriors. Upon examination, intracanal medicament (non-setting CaOH) was placed in the canals along with acavitcovering the pulp chamber followed by glass ionomer (GI) as a final temporary restoration *(Figure 2)*. The tooth was tender on percussion. Therefore, continuation of root canal treatment was performed. The treatment was done on three visits. Between each visit, canals were then filled with non-setting CaOH and tooth was restored by cavit followed by GI. On the first visit, local anesthesia was administered followed by rubber dam placement. Then, access cavity with medium round long bur followed by gates glidden was performed. On access, three canals were identified by inspection with a sharp explorer (mesiolingual, mesiobuccal and distal). After that, working length (WL) determination was established. The WLfor the distal canal was 27.5 mm (size 15 K file), the mesiobuccal canal was 19.5 (size 10 K file), the mesiolingual was 28 mm (size 10 K file). An electronic apex locator and periapical radiograph were used for WL confirmation *(Figure 3)*. On the next appointment, after a week, the symptoms disappeared and instrumentation using protaper nickel-titanium rotary instruments (0.04 Taper) to size 40 followed by step back technique with K files until size 80 was done. 5% sodium hypochlorite copious irrigation was utilize during cleaning and shaping procedure. Dryness was achieved by paper points. On the third appointment, Master cone try in and obturation was performed *(Figures 4 & 5)*. Size 40 master cone were used for distal canal and 35 for mesio-buccal and lingual canals. AH plus sealer with accessory cones were placed in the canals by using lateral condensation technique. Moreover, system B was utilized to achieve the perfect condensation and cut. Subsequently, a layer of cavit was placed in the chamber for a seal followed by GI until further treatment (prosthetic treatment (post and core and crown)). As for the outcome and follow up, the patient returned after 3 weeks and no symptoms or clinical inflammation were

noticed. The patient revealed that she is pregnant therefore, no x-ray were taken for her**.**

Figure 1: Panoramic radiograph that shows generalized increased root length.

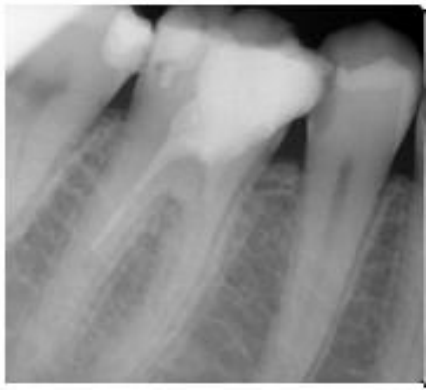

Figure 2: preoperative radiograph.

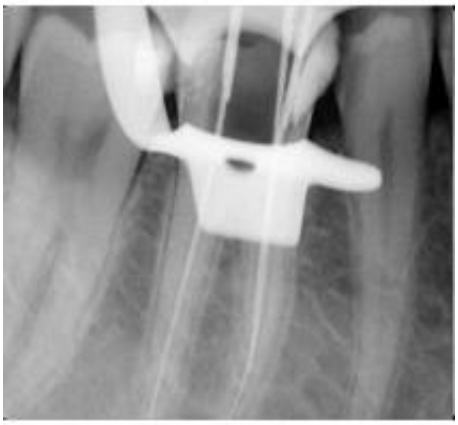

Figure 3: Working length determination.

Figure 4: Master cone try in.

Figure 5: Obturation.

Discussion

The golden endodontic treatment is to establish a clean, shaped, environmentally free canals with proper obturation. However, sometimes some obstacles can be faced due to different variation of the morphology of the tooth, such as radiculomegaly *[11]*. Having this kind of condition is usually associated with multiple syndrome, such as otodental dysplasia, and oculofaciocardiodental (OFCDS) syndrome *[12]*. Cases of non-syndromic radiculomegaly are rare as only twenty cases have been documented so far from 2010and all of them were reported in canines *[13]*. Usually the age between 15-20 years old is the best time to confirm such a diagnosis since it become more clear and evident during this period *[14]*. From a clinical perspective, having this anatomic variation can complicate endodontic treatment planning if not diagnosed properly, therefore it is essential for any physician to have a proper idea about the case regarding the size and shape of the crown and roots and the number of roots associated with a tooth. In addition, an appropriate radiograph before any treatment is recommended *[15]*. Finally, in some cases it is preferable to consider extraction in cases where there will be poor endodontic treatment outcome.

Conclusion

Cases with extreme root length can be encountered. Therefore, it is crucial for those cases to be documented due to the lack of them being reported. Such case report can inform clinicians of aberrant root canal anatomy which can occur with any tooth that may appear otherwise normal, and also show the high probability of failure of root canal treatment when such variation is not being properly dealt with.

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