



Mandibular Canine with Two Canals: A Case Report in Saudi Arabia

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ABSTRACT

The Knowledge of the root canal morphology is essential for the success of the endodontic treatment. The most common anatomical configuration in mandibular canines is to have one root with one canal. However, previous studies reported 4.6% to 15% of the cases to have a second canal. In order to increase the knowledge about root canal morphology in the Saudi population, we reported a clinical case about successful endodontic management of mandibular canine with two joined canals (Vertucci type II) in Saudi females.

Keywords: Endodontics, Mandibular canine, Root canal configuration

INTRODUCTION

Endodontic practice requires clinician's awareness about the different anatomical configuration of the root canal system [1-3]. The knowledge of the root canal morphology and the assessment of the preoperative radiographs were always essential to the success of Root Canal Treatment (RCT) [4-8]. Previously published investigations have described the root canal morphology of different permanent teeth, including mandibular canine. The reported configuration and number of root canals in permanent mandibular canine had a high variation among different studies [9-11].

The majority of mandibular canines have only one canal [4,11-13]. However, two canals with one or two foramina have been reported to be approximately 15% [9,11]. Wang, et al., reported 4.9% of the examined mandibular canine has two canals and one foramen, and 1.2% contains two canals and two foramina [4].

Most published anatomical studies were conducted in the western population. Only one published study reported the incidence of two canals in the Saudi population [12]. Few Case reports were found in the literature about clinical cases with two canals [5,14-16]. In the current report, a clinical case was presented about successful endodontic management of mandibular canine with two canals in Saudi females, in order to add to the current knowledge about root canal morphology in the Saudi population.

Case Report

A 52-year-old Saudi female patient with no relevant medical condition was referred to King Saud University, College of dentistry to Endodontically treat the lower left canine. Past dental history showed multiple root canal treatments and fixed partial dentures. Upon clinical examination, cervical caries was detected facially; the tooth was negative to percussion and palpation. With thermal testing, the tooth showed lingering pain. The preoperative periapical radiograph of tooth #33 showed cervical caries with normal periapical tissues (Figure 1). The tooth was diagnosed as asymptomatic irreversible pulpitis with normal apical tissue. No mobility or deep pockets were found. The Endodontic treatment plan was non-surgical root canal treatment. The treatment was scheduled and initiated after obtaining written informed consent from the patient.



Figure 1 Pre-operative radiograph

Local anesthesia (2% xylocaine with 1:80,000 epinephrine) was introduced through infiltration and the tooth was isolated with rubber dam using ivory 9 clamps. Facial caries removed with round bur (size 2) and the cavity was prepared to gain access to the root canal system. Lingual extension of the access cavity was performed to expose the second canal (Figure 2). The pulp chamber was accessed, and both the buccal and lingual canals were located under magnification (X2). The working length for both canals was established with an apex locator (DENTA PROT ZX) and confirmed with radiographs (Figure 3). The root canal configuration consisted of two canals leaving the floor of the pulp chamber and existing at a single apical foramen. The cervical parts of the canals were pre flared with Gates-Glidden burs (Dentsply Maillefer- size 2). The canals were instrumented with a profile rotary system using crown down instrumentation technique up to size 35\04. The root canals were irrigated with 10 ml 2.5% sodium hypochlorite during the preparation procedure. 17% ethylenediaminetetraacetic (EDTA) 5 ml was used as a final irrigant for smear layer removal. The canals were obturated with lateral condensation technique (Figures 4 and 5). After obturation, the access cavity was sealed with a layer of GIC (GC Fuji II LC, United states) and composite resin restoration (Dentsply Spectrum, United States).



Figure 2 access cavity preparation from the facial aspect



Figure 3 Working length radiograph confirmed the root canal configuration. The two canals are joined at the apical third

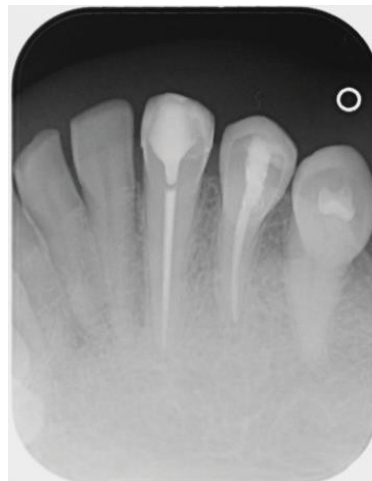


Figure 4 Final straight radiograph after obturation

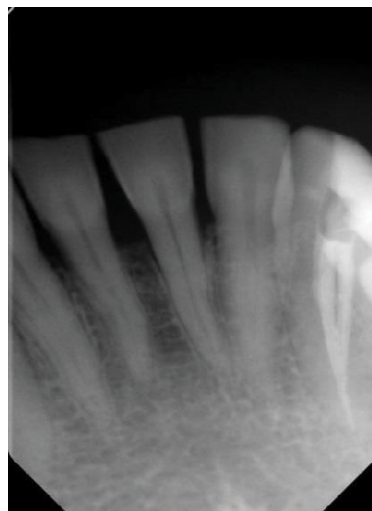


Figure 5 Final mesial angulation radiograph after obturation

DISCUSSION

RCT is indicated for mandibular canines due to caries, erosion, attrition, or trauma. Moreover, intentional is frequently needed for a prosthetic reason, especially for overdenture abutments. Before initiating any endodontic treatment, it is essential to predict the root canal configuration from previous knowledge and careful assessment of preoperative radiographs [17]. Furthermore, the presence of a second canal could be expected if the contralateral canine has two canals. Recent CBCT studies found that 91%-97% of the cases have a symmetrical anatomical configuration [12,18,19]. The expected root canal configuration will be confirmed clinically after access cavity preparation and locating all canals. The relation between the canals can be predicted from the orifices proximity, the probability of canals being joined will increase if canal orifices are closer to each other [20].

International studies reported 5%-15% of mandibular canines to have two canals [9-11,13,20]. Different root canal configurations were reported in the Saudi population [5,14-16]. Recently, Al-Dahman, et al., performed a CBCT anatomical assessment of mandibular canines in the Saudi population. Their results revealed that 4.6% of mandibular canines have two canals [12]. Alenezi and Al-Hawwas reported a case of mandibular canine with one root and Vertucci type II root canal configuration (two canals joined apically) in a Saudi male patient [5]. Another case was reported of Saudi female patients with the same configuration in mandibular canine [15]. In the literature, we found contradicting results of the number of canals among male and female patients [19,21]. According to Al-Dahman, et al., the two canals configuration in a mandibular canine had a higher incidence in male compared to female patients in Saudi subpopulation [12]. However, the current reported case was the management of canine with two canals in a Saudi female patient. This emphasizes the importance of expecting different root canal configurations in all patients regardless of gender. Clinicians are encouraged to review the root canal morphology of different teeth. All efforts should be made to detect all existing canals in the root canals system through proper assessment of pre-operative radiographs and careful examination of the pulp chamber.

DECLARATIONS

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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