

Bilateral Presence of a Single Root in Mandibular Second Molars having a Single Non-Conical Canal Configuration: A Rare Case Report

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Abstract

A successful endodontic therapy depends upon complete knowledge of the anatomy and the variations present in the human dentition. Variations in anatomical configurations, especially those of molars is quite common and often reported in literature. Studies have reported the tendency of Asians to show a C- shaped canal morphology. Contradictory to those findings, we report a unique and a rare case having bilateral presence of a single root with single, non-conical root canal morphology in the mandibular second molars of a middle aged Indian male.

Keywords: Bilateral, Non-Conical Canal, Second Molars, Single Canal, Single Root.

Introduction:

It is a dentist's ultimate desire to relieve the pain of his patient and more than often, patients who need to undergo endodontic therapy experience some kind of pain. To alleviate this kind of pain, it is extremely important to have a thorough knowledge of internal and external anatomy of all the teeth present. In conjunction to this, a correct diagnosis, appropriate cleaning and shaping of the root canal system leads to a successful endodontic treatment outcome.¹ According to Slowey (1974), one of the major cause of endodontic treatment failures has been attributed to a lack of understanding as well as underestimation of the root canal morphology.²

When it comes to aberrant root forms, the presence of a single, tapering root form can be found in any molar, most common being second and third permanent molars.³ Also, root dysmorphology shows female predilection, the cause for which is still unclear.³

The general anatomical configuration of the second mandibular molar is of two roots (one mesial and one distal). The roots can fuse to form a single conical root with varying internal anatomy and often have C-shaped canal configuration.⁴ Ethnicity plays an important role in the formation of C-shaped canals and is more commonly seen in Chinese, Korean and Indian populations.^{5,6}

We present a rare case report, showing the bilateral presence Vertucci's type I (1-1) root canal having a single root canal with one orifice and one apical foramen in the mandibular second molars.⁷ It is of great clinical importance to note that our case had a single root and a single, non-conical root canal morphology, which is quite unique and rare.

Case Report:

A 32 year old male patient came to the Department of Public Health Dentistry, ITS Dental College, Hospital and Research Centre, Greater Noida complaining of

pain in his lower left back tooth region since 2 days which extended up to his forehead and was constant in nature. The pain aggravated upon eating anything hot or cold and relief was attained only with medication (analgesic). The medical history of the patient was non-contributory. Upon clinical examination, the left mandibular second molar (tooth number 37) showed a frank carious lesion and was tender on percussion. An Intraoral periapical radiograph (IOPAR) was taken to check for periapical pathology, which was found to be absent (Figure No. 1). The IOPAR revealed occlusal caries (radiolucency) involving the mesial pulp horn and confirmed the presence of a single root, and a single, non-conical canal. Also, an observation of calcification (about 2-3 mm) towards the apex was made.

Following administration of local anaesthesia, isolation was achieved using rubber dam and emergency access opening was done. Insertion of a 20 No. K file clinically confirmed the presence of a wide, single canal orifice (Figure No.2). The pulp chamber and canal was copiously irrigated with 3% sodium hypochlorite and normal saline and a closed formocresol dressing was given. The tooth was made out of occlusion to prevent the development of a periapical pathology/ pain during mastication. The patient was asked to contact immediately, in case of any pain and was recalled after two days.

A diagnostic IOPAR was taken to determine the working length which came out to be 16 millimetres (Figure No. 3). Biomechanical preparation was achieved by doing circumferential filing on the second visit. Owing to the wide anatomy of the canal, neither a crown down, nor a step back procedure could be done. A 70 no. gutta percha point was used as master cone to obtain an apical tugback; with additional cones being added using the lateral condensation technique to completely obturate the root canal (Figure No. 4). The patient was further recalled after a week and a permanent post-endodontic composite restoration was done.

In addition, the mandibular right second molar (tooth number 47) also showed signs of frank caries, for which an IOPAR was advised. The IOPAR revealed deep caries approaching the pulp and like the

contralateral tooth, revealed presence of a single root, and a single, non-conical canal (Figure No. 5). Since the patient did not experience any pain, he declined our suggestion to undergo a RCT procedure for the same tooth.

Discussion:

Variations in the anatomy of the configuration of mandibular molars is quite common. Manning et al. (1990) reported a high frequency of single rooted mandibular second molars in Asians.⁸ Going a step further, Cmili et al (2005) using spiral computed tomographic imaging, documented the prevalence of C-shaped canals in single rooted mandibular molars as 8% in Asian population.⁹

We found the presence of a bilateral single root with a single, non-conical canal in the second molars in our case which is quite rare especially in Indian population.⁶ This is in agreement with Sabala et al. (1994), who stated that the rarer the aberration, greater will be the probability of it being bilateral.¹⁰ A similar incidence of bilateral C-shaped maxillary first molars in an 11-year-old Caucasian female was reported by Dankner et al. (1990).¹¹ Our findings can be compared to Shetty et al. (2009), who reported a single, straight canal in second molars of two cases, with their contralateral teeth also showing the same morphology.¹² However, the root apex of both cases were tapered and conical in nature, and hence, they could perform a step back preparation, which was not possible in our case.

In cases where only one canal is present, its location usually will be in the centre of the root. It is important to take note that a root always has a root canal, even in the most complex cases where the canal is not visible on the radiograph and is difficult to locate as well as negotiate.¹³ One of the key factors in the success of endodontic therapy remains instrumentation, hence, a dentist should try to be aware of all the anatomical variants and aberrant canal configurations present in human teeth. A thorough examination of the pulp chamber and ensuring complete debridement of all the canals increases the chance for long term successful endodontic therapy.¹⁴



Figure No. 1: Tooth number 37 showing involvement of mesial pulp horn.



Figure No. 2: Presence of a wide, single canal was seen clinically



Figure No. 3: Determination of working length (16mm)



Figure No. 4: Obturation completed



Figure No. 5: Presence of single canal in tooth number 47

Conclusion:

Our case report depicts a rare and uncommon case of bilateral second molars having a single root with a single, non-conical canal. A keen eye on such occurrences helped us report this case. We hope that this case report shall immensely help our peers as we bring forth a clinical anomaly for them to discuss and relate to in the near future.

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