



LETTER TO THE EDITOR

Short root anomaly of a single tooth: a rare finding

Anomalia de raiz curta em um único dente: um achado raro

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We would like to share an interesting radiographic finding in a first premolar (Figure 1). A 45-year-old female patient reported of food impaction in her left mandibular molar, for which endodontic treatment with metallic crown was done three years ago. A periapical radiograph of the molars in that quadrant incidentally revealed a short root/abnormal small length of first premolar root compared to other permanent teeth. Crown size and shape were normal, but the root was showing characteristic morphology of a completed root formation with conical shaped apex. The length of the root, however, was almost half of the usual size with a crown-root ratio of approximately 1:1. Intact periodontal

ligament space and a continuous lamina dura were noticed around the tooth. Normal bony trabeculae were seen surrounding the root, not suggestive of any pathologic changes. The root canal was extending almost until the apex of the tooth. No history of previous trauma, orthodontic treatment or any other dental procedures was reported. On further clinical examination of the tooth, the crown appeared to be exactly similar in colour, size and morphology as the other premolars with no evidence of decay or mobility. The tooth vitality was confirmed by thermal and electrical vitality test.

Thus, two main possibilities were considered for diagnosis, external resorption of the root or a

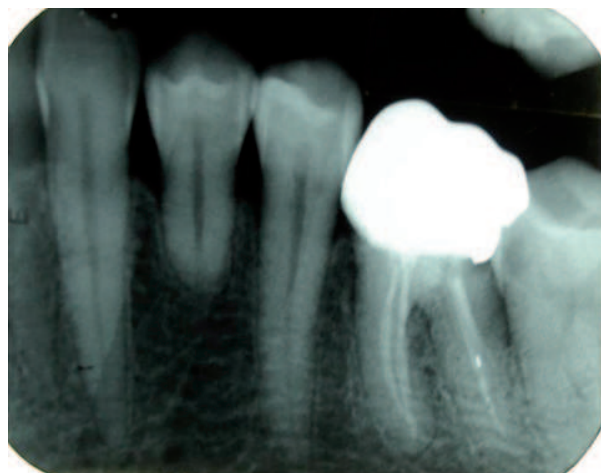


Figure 1 - Abnormal short length of a single tooth with a normal crown size, periodontal ligament space and an intact lamina dura

developmental anomaly. Resorption usually occurs as a result of pressure effects, inflammation, neoplastic process and/or systemic conditions. In our case, the patient was otherwise healthy. It is indeed difficult to rule out the possibility of any traumatic incident which was unnoticed by patient. In such case, tooth would have lost its vitality and periapical changes would be noticed in radiograph. No significant pathologic bone changes were seen surrounding the tooth in the radiograph. Moreover, the smooth regular outline of the root apex pointed strongly in favour of a diagnosis of a developmental abnormality of the root. A study on morphometric assessment of root canals of mandibular first premolars in Indian population showed straight canals (Type I) in 72% of the cases. But the morphological variations of root canals of mandibular first premolars are common and can be considered normal (1). *Microdontia* is the term usually used to describe a developmental discrepancy in tooth crown and root size lesser than the usual. However, the term *microdontia* was not considered appropriate as the tooth crown exhibited normal size with an abnormal decrease in just the root length but not the width. Thus, a short root anomaly affecting a single tooth was considered. To the best of our knowledge, idiopathic short-rooted single tooth is not widely discussed in literature.

Lind introduced the term *short root anomaly* for describing mainly abnormal but symmetrical short root morphology affecting maxillary incisors. Short

root anomaly (also known as root dwarfism, rhizomicy) can manifest in a localized or generalized pattern, though the latter is extremely rare (2). Quantitatively, relative root length, which is the ratio between root length and crown length (R/C), should be measured from radiograph, measuring 1.1 or less for a diagnosis of short root anomaly. The maxillary central incisors are generally the most frequently short-rooted teeth, followed by maxillary and mandibular premolars whereas mandibular incisors are very rarely involved. The various causes of short root anomaly manifesting in a generalized pattern are familial, syndrome-associated, environmental, and idiopathic. Occurrence in other family members suggests a familial expression of arrested root formation via an autosomal dominant transmission. Generalised short root anomaly has been known to occur in developmental disturbances of the dental tissues like dentinogenesis imperfecta and dentin dysplasia and also syndromes like Rothmund-Thomson syndrome and some short stature syndromes. Becktor et al. reported a case of disturbed tooth development consisting of short roots, irregular roots and partially obliterated pulp chambers in teeth with primary or secondary retention (3). Radiotherapy to the oral tissues at the time of tooth development or, less frequently, chemotherapy for childhood malignancies can result in stagnated or irregular development of root (4). Rarely, idiopathic etiology has also been speculated, which may probably be a result of fresh mutations or variable penetration of an autosomal dominant trait (2).

Short root anomaly is a significant finding for the dental clinician as such teeth have an increased tendency to undergo external root resorption (2). Therefore, special precautions should be taken to avoid factors such as severe orthodontic forces and masticatory stress and prevent further loss of apical root structure. Periodic radiographic evaluation of root length is beneficial in cases that a progressive root length reduction has to be ruled out/continued environmental insult is expected. Pretreatment root length estimation using radiographs is mandatory, especially when orthodontic, prosthetic, periodontal, or endodontic therapy is contemplated. Abnormal short root of the tooth makes it inefficient to function as an abutment for fixed prostheses and, consequently, it can be a contraindication for prosthodontic therapy. Extraction of such short-rooted teeth usually does not pose great difficulty. However, if

elevators are to be used, caution should be exercised not to luxate adjacent teeth and cause inadvertent mobilization (2).

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