CASE REPORT

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Dilacerated distolingual root of mandibular first molar mimicking cementoblastoma: case report by radiographic findings

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ABSTRACT

Objectives: This case report aimed to report an extra root number of mandibular first molars that are mimicking benign cementoblastoma in the periapical radiograph and clarified using cone beam computed tomography (CBCT) examination.

Case Report: A 22-year-old female patient was referred from private clinic to Radiology Department of Universitas Padjadjaran Dental Hospital for a CBCT examination of the left mandibular first molar with benign cementoblastoma as the provisional diagnosis.

Conclusion: It is necessary to consider CBCT examination in order to obtain accurate diagnosis of the presence of distolingual root.

Keywords: *Distolingual root, dilaceration, cone beam computed tomography*
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INTRODUCTION

The term dilaceration comes from the Latin "dilacero" which means tear up. Tomes in 1848 was the first to report dilaceration as a seldom seen developmental change of the dental root.[1–3] Dilaceration occurs when the development of the tooth is disrupted, resulting in a steep bend or curve in the crown or root.[4] When the mesial or distal tilt of the root is equal to or exceed 90 degrees in regard to the tooth or root axis, Hamasha et al. (2002) and Malcic et al (2006) consider the tooth to be dilacerated. Meanwhile, Chohayeb et al. (1983) consider a tooth to be dilacerated when its apical deviation is equal to or exceeds 20 degrees in relation to the normal tooth axis. The etiology of this anomaly is controversial but most cases are idiopathic and have no clinical feature.[1,5,6]

In a study by Hamasha et al. in 2002, dilaceration was found to impact 3.7% of all teeth and 17% of teeth studied.[1] Despite the fact that dilaceration is more common in the maxillary arch than in the mandibular arch, many scientists agree that the mandibular third molars are the most impacted teeth. Furthermore, permanent teeth are more usually afflicted than deciduous teeth, and posterior teeth are more commonly affected than anterior teeth. Some individuals may have bilateral dilacerations.[1–3]

In some cases, dilaceration of root is found as an incidental finding when taking a radiography examination, especially when diagnosing a case for root canal preparation. Researchers have investigated and developed techniques to determine the curvature of root canals in periapical radiographs for many years, utilizing either the angle or the radius of curvature method. However, there are some major limitations to this diagnostic imaging techniques, particularly because it provides a two-dimensional image of a three-dimensional structure. When compared to conventional radiography, cone-beam computed tomography (CBCT) became more widely used to evaluate anatomical and pathological abnormalities, providing new perspectives.[7,8]

For specialized dental procedures, such as root canal therapy, surgical extraction, periodontal treatment, and orthodontic movement, information on molar root morphology, was important. The roots of mandibular molars are usually located mesiodistally, however there are several anatomical variants. The presence of a supernumerary (disto-lingual [DL]) root is the most common variation in this tooth type. Distolingual root of mandibular first molar was first mentioned by Carabelli in 1844 and was later termed radix entomolaris (RE) by Bolk in 1915.[7,9,10] Dilacerations can be misdiagnosed with other radiopaque conditions associated with the periapical area of the tooth such as hypercementosis, fused roots, sclerosing osteitis or dense bone islands. Notable, vigorous disto-lingual root dilaceration could mimics cementoblastoma.[4] Careful radiography interpretation with the right choice of imaging could detect the abnormality of dental structure.

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CASE REPORT

A 22-year-old female patient was referred from private clinic to Radiology Department of Universitas Padjadjaran Dental Hospital in West Java, Indonesia for a CBCT examination of the left mandibular first molar. From the information of the referring dentist, it was found that this patient had a previous periapical radiograph in another clinic and from that radiograph, the lesion associated with the left mandibular first molar was radiodiagnosed as a benign cementoblastoma. The left mandibular first molar also had pulp decay which required root canal treatment. CBCT showed that the left mandibular first molar had an extra root, called distolingual root and it dilacerated ± 50° buccally (Figure 1).

After underwent the CBCT examination, the patient continued the root canal treatment in Dental Hospital of Universitas Padjadjaran and followed-up with periapical radiograph (Figure 2). This radiograph showed a well-defined radiopacity with cortical border and a well-defined radiolucent band inside the cortical border in association with the apical of mesial root.

DISCUSSION

The number of roots, their location, and the number of root canals in the permanent mandibular first molar might vary. Mandibular molars generally had two roots, however the presence of a third root of permanent mandibular molars was an important anatomic variation. This extra root could be found on the lingual side, which was known as radix entomolaris, or on the facial side, it was known as radix paramolaris.[11]

Some parts of dentistry required a thorough understanding of dental anatomy and the presence of the distolingual root was regarded as an important variation.[6,12] The distolingual root could be detached from the other roots or partially fused with them.[13] According to a study of Abella F et al in 2012 about mandibular first molars with disto-lingual roots, the distolingual root occured 14.4% in frequency and the occurrence of the distolingual root was clearly linked to certain ethnic populations.[12] Song JW et al in 2010 categorized distolingual roots of mandibular first molar into five types according to their morphologic features using 3D images that were reconstructed from cross-sectional CT images with the aid of 3D reconstruction software (Figure 3).[14]

Diagnosing a dilaceration was critical for root canal therapy, extractions, and orthodontic movement, so investigating dilacerations had evident benefits for patient care.[1,5] Two hypotheses have been suggested to explain the origins of dilaceration: the first was initial tooth trauma that induces tooth germ displacement, causing the permanent tooth root to form an angle. A second theory deals with a developmental disorder of uncertain origin when a traumatic factor wass unknown.[1,3,6] Careful radiography interpretation could detect changes in the normal structure of roots in the mandibular molar. To avoid difficulties or canal loss during root canal therapy, an accurate identification of the third root was required. Specific characteristics, such as the lack of a defined outline of the distal or mesial root contour or the root canal, could indicated the presence of a third root.[11]

Figure 1. The CBCT of left mandibular first molar in (A) Reformatted coronal plane; (B) Sagital plane; (C) Axial plane. The yellow arrow showed the dilacerated distobuccal root.

Figure 2. (A) The periapical of obturation trial and (B) evaluation of obturation. The yellow arrow showed a corticated round radiopaque area surrounded by radiolucent band.

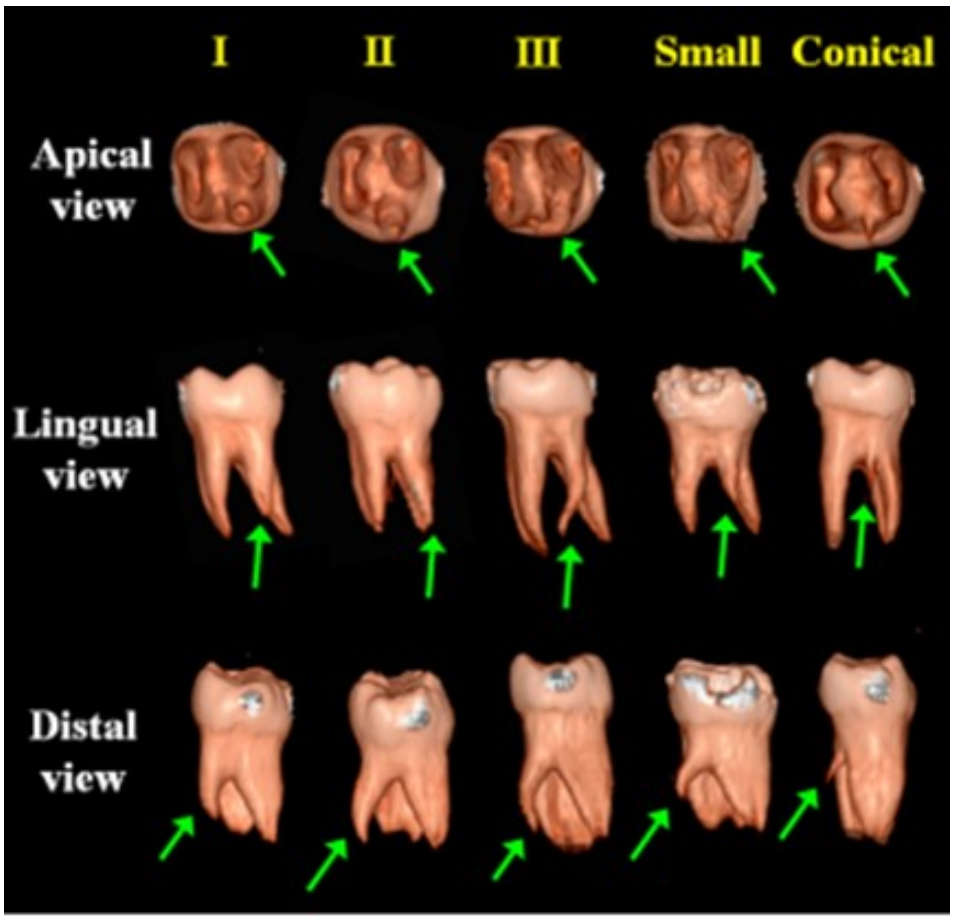

Figure 3. Three-dimensionally reconstructed images of molars with a DL root (arrows). The apical, lingual, and distal views of the five types classified according to their morphologic characteristics (type I: no curvature; type II: curvature in the coronal third and straight continuation to the apex; type III: curvature in the coronal third and additional buccal curvature from the middle third to the apical third of the root; small type: root length less than half that of the distobuccal root; conical type: cone-shaped extension with no root canal).[14]

Radiographic examination was used to diagnose root dilaceration. Panoramic radiographs alone could not be considered as the only diagnostic tool because root dilation can occur in the facial or lingual (palatal) aspects. In terms of identifying lesions at the periapex, Rohlin et al. (1989) reported that periapical radiography performed better than panoramic radiography.[1] The conventional radiographs were not considered as the best approach in determining the root morphology because of the two dimensional image and overlapping morphology. Cone-beam computed tomography (CBCT) was the latest imaging modality that offer the ability to evaluate the number of roots and root canals without any superimposition.[8,15,16]

The mesially or distally dilaceration would clearly visible from periapical, but when it comes in facially or lingually, the x-ray passes almost parallel to the deflected portion of the root, creating the appearance of "bull's eye" and the PDL space will appear as a radiolucent band (halo line) that surrounding the radiopaque area.[4,5] This appearance is considered similar to cementoblastoma because cementoblastoma has a radiographic feature of well-defined radiopacity with a cortical border and a well-defined radiolucent band inside the cortical border.[4,17,18]

CONCLUSION

Clinicians should consider another possibility regarding to the radiopaque conditions of periapical area. Particularly if the interpretation showed a corticated, well-defined radiopaque with a halo line surrounding the periapical area. It was necessary to consider CBCT examination in order to obtain accurate diagnosis of the presence of distolingual root.

FOOTNOTES

All authors have no potential conflict of interest to declare for this article. Informed consent was obtained from the patient for being included in this case report.

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