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Mental foramen mimicking as periapical pathology - A case report

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ABSTRACT

The radiographic recognition of any disease requires a thorough knowledge of the radiographic appearance of normal structure. Intelligent diagnosis mandates an appreciation of the wide range of variation in the appearance of normal anatomical structures. The mental foramen is usually the anterior limit of the inferior dental canal that is apparent on radiographs. It opens on the facial aspect of the mandible in the region of the premolars. It can pose diagnostic dilemma radiographically because of its anatomical variation which can mimic as a periapical pathosis. Hereby we are reporting a rare case of superimposed mental foramen over the apex of right mandibular second premolar mimicking as periapical pathology.

Keywords: mental foramen; periapical radiolucency; mandibular premolars

INTRODUCTION

Many articles have been reported about various conditions that may mimic periapical inflammatory lesion such as carcinoma (1), odontogenic cyst (2) and periapical cemental dysplasia (3) etc. Film processing errors has also been reported to mimic the appearance of periapical infection (4), while normal anatomies such as the mental foramen or incisive foramina are familiar as radiolucencies that may overlie teeth and cause diagnostic confusion. This case report enlightens an anatomical variation of mental foramen (MF) manifesting as well defined periapical radiolucency in relation to the roots of lower right second premolar, which was suggestive of periapical pathology.

CASE REPORT

A 30 year old male patient reported to the Department of Oral Medicine and Radiology with the complaint of tooth decay in the lower right back tooth jaw region since six months. It was associated with dull, intermittent, non-radiating type of pain. Medical, family and dental histories were non-contributory. On intra oral examination, deep class II cavity with respect to right second premolar, first and second molar was observed. Provisional diagnosis of chronic irreversible pulpitis was considered for right mandibular first and second molar and deep dental caries with respect to right mandibular second premolar.

Periapical radiograph of right mandibular posterior region revealed diffuse coronal radiolucency

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involving pulp with no periapical changes noticed with respect to mandibular molars. The mandibular second premolar revealed diffuse coronal radiolucency approximating the pulp with intact lamina dura in the periapical region. Hazy periapical radiolucency (Figure 1) noticed at the apex of mandibular second premolar with poor defined borders mimicking as periapical pathology. To rule out, a second radiograph (Figure 2) was taken at different angulation which revealed the same finding but the radiolucency had moved mesially with an intact the lamina dura around the tooth, hence we arrived at a provisional diagnosis of mental foramen which was mimicking as periapical pathology. We also noticed increased in the width of root at the apical one third of the second premolar suggestive of hypercementosis. The patient was referred to the Department of Conservative Dentistry and Endodontics for the further treatment.

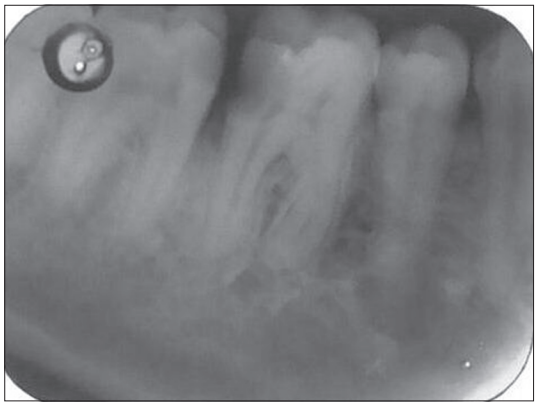

FIGURE 1. Intraoral periapical radiograph showing the poor-defined periapical radiolucency at the apex of mandibular second premolar with intact lamina dura around the root, mimicking as periapical pathology.

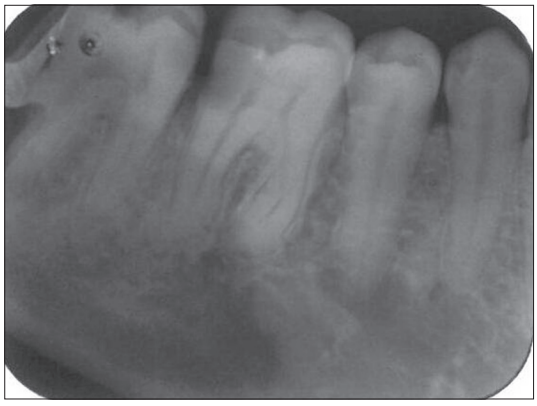

FIGURE 2. The second radiograph of mandibular premolar region from different angulation showed slight mesial shift in the periapical radiolucency with intact lamina dura.

DISCUSSION

The MF is an opening on the anterolateral surface of the mandible, which is generally seen to be oval or circular in shape from where the mental neurovascular bundle exits. After passing through the mandibular foramen, the inferior alveolar nerve and artery, exit at the mental foramen as the mental nerves and vessels which innervate the lower teeth, lip, gingiva and soft tissues of chin area. The foramen opens directed posteriorly, outward and upwards. There are variations in the position of mental foramen. Frequent position is in between and below the apices of first and second premolars (5).

The mental nerve is a somatic afferent sensory nerve and corresponds to the terminal branch of the mandibular nerve, which is the third division of the trigeminal nerve. In the premolar region, the inferior alveolar nerve, a branch of the mandibular nerve, usually splits into two branches, the mental nerve and the incisive nerve. The incisive nerve runs intra-osseously along with veins and innervates the anterior mandibular teeth (incisors, canines, and premolars) (6). The mental nerve emerges at the mental foramen and divides into four branches: angular (innervations of the angle of the mouth region), medial and lateral inferior labial (skin of the lower lip, oral mucosa, and gingiva as far posterior as the second premolar), and mental branch (skin of the mental region) (7).

It is usually the anterior limit of the inferior dental canal that is apparent on radiographs. Its image is quite variable and it may be identified only about half the time because the opening of the mental canal is directed superiorly and posteriorly. Because of this, the usual view of the premolars is not projected through the long axis of the canal opening. This circumstance is responsible for the variable appearance of the mental foramen (8).

Mental foramen variations are often encountered, ranging from difference in position of foramen

on anterolateral surface of mandible or presence of accessory foramina or even complete absence in some rare cases. The location of mental foramen also changes along with the age changes (9). Usually the MF is seen to be closer to the alveolar ridge in children before tooth eruption; as the teeth starts to erupt the MF starts descending to the midway between the upper margin and lower border and in adults with the teeth present for long time, the MF moves is somewhat closer to the inferior border comparatively. In old age eventually with the loss of teeth and bone resorption of the edentulous ridge the MF moves relatively up towards the alveolar ridge. In extreme cases of resorption, the MF and the adjacent part of the mandibular canal are open at the alveolar margin. According to the degree of resorption, in severe cases, the mental nerve and the final part of the inferior alveolar nerve may be found directly under the oral mucosa (10).

Radiographically, this foramen appears as small, ovoid or round radiolucent area located in the apical region of the mandibular premolars (11). The absence of a MF (12) and the presence of multiple MF (13) are rarely reported. The presence of more than one MF, referred to as accessory mental foramina, has been noted on dissection, surgical findings, conventional radiographs, spiral computed tomography (CT), and cone beam CT.

When it is projected over one of the premolar apices, it may mimics periapical disease as seen in our case. In such cases, evidence of the mandibular canal extending to the suspected radiolucency or a lamina dura traceable around the root apex would suggest the true nature of the radiolucency. In the case presented here, there was intact lamina dura around the root. However, the lamina dura superimposed on the radiolucent foramen may be of too low a density to be recognized in the image ('burn out') (14). Nevertheless, a second radiograph from another angle is likely to show the lamina dura clearly, as well as some shift in position of the radiolucent foramen relative to the apex (8). Similarly, the second radiograph was taken in the present case which showed intact lamina dura with slight mesial shift in the periapical radiolucency. Thus, confirming our diagnosis of mental foramen mimicking as periapical pathology.

However, radiography is not a perfect diagnostic tool, partly because radiographs are two-dimensional representations of three-dimensional structures, and partly because particular clinical and biological features may not be reflected in radiographic changes. The presence of a lesion may not be directly evident and its real extent and the spatial relationships to important anatomical landmarks are not always easily visualized. The diagnosis and management of periapical pathosis requires a thorough clinical and radiographic examination. As chronic apical periodontitis often develops without subjective symptoms, the radiological diagnosis is particularly important and should not be confused with the variations of the normal anatomical landmarks.

CONCLUSION

A basic knowledge of the variations of the normal anatomical landmarks of jaw bones is mandatory for all the dental physicians, so that we can avoid misdiagnosing as any periapical pathology. In this paper, we have highlighted about the variations of mental foramen which was mimicking as periapical pathology. As the routine dental intraoral radiographs are the two dimensional representation of the three dimensional object, the newer radiographic methods has to be implemented to overcome this limitation.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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