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Lingual opening of mental foramen - An exclusive and unique presentation

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Abstract

Mental foramen is one of the most important mandibular landmarks. It is round or oval in shape and marks the termination of mental nerve. It is generally present on the buccal surface of the mandible; the most common site being the premolar region. It is of great clinical significance during anaesthetic nerve block, osteotomy procedures, fracture, apical surgery, implant placement, and complete denture fabrication. Cases with double or triple accessory mental foramina as well as absent mental foramen have been reported. Hence, it is important to know strategic position of mental foramen. Till date, such a clinical presentation seems to be a very rare occurrence. Thus, we present radiographic finding of a case having lingual opening of mental foramen.

Keywords: mandibular landmark, mental foramen, lingual opening, unique

Introduction

Anatomic landmarks play an important role in dentistry. Their location, size, shape, number etc. influence diagnosis and management of dental diseases. Mental foramen is one of the most important mandibular landmarks. It is round or oval in shape and marks the termination of mental nerve. 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 lower face.[1] It is generally present on the buccal surface of the mandible; the most common site being the premolar region. It is of great clinical significance during anaesthetic nerve block, osteotomy procedures, fracture, apical surgery, implant placement, and complete denture fabrication.[2, 3] Cases with double or triple accessory mental foramina have been reported. Till date, such a clinical presentation seems to be a very rare occurrence. Thus, we present radiographic finding of a case having lingual opening of mental foramen. We present radiographic finding of a case having lingual opening of mental foramen.

Case Report

A 67 year old male patient was referred to our radiology centre for CBCT scan of mandible for implant placement. CBCT scan showed completely edentulous mandible. On thorough examination, the mental foramen appeared to be abnormal on the left side of mandible (Fig. 1). A small point size opening was seen near the crest, which could be opening of a nutrient canal or a small mental foramen (Fig. 2). On examining the lingual surface, a round opening was present, near the inferior surface of mandible. It was present in premolar region (Fig. 3&4). The direction of opening was posterior and inferior. The lingual opening was larger in size than its buccal counterpart. The right side showed normal position of the mental foramen (Fig. 5).

Cone Beam Computed Tomography was done to evaluate the dental implant site. The images obtained are 1:1 and are highly accurate. It enables 3-D visualization of the structures. As a result, all surfaces of the jaws can be analysed, which is not possible in conventional 2D imaging. Analysis of lingual surface showed the lingual opening of mental foramen. Thus, CBCT played a vital role in detection of our finding.

Discussion

Mental foramen is one of the most important mandibular landmarks. It marks the termination of mental nerve. The inferior alveolar nerve and artery, exit at the mental foramen as mental nerve and vessels which innervate the lower teeth, lip, gingiva and lower face.[1] The shape of the foramen is either round or oval. The direction of opening is superior, posterior and lateral. In the current case, the shape was round and direction was inferior, posterior and mesial.

It is generally present on the buccal surface of the mandible; the most common site being the premolar region. The position is not constant universally. It is somewhere in between canine and first molar. Roy et al, [4] Rani et al, [5] Igbigbi et al, [6] found in line with the second premolar was the most common location. Whereas according to Lopez it is the first premolar. Haghanifar et al, [7] Al-khateeb et al, [8] Olasoj et al, [9] Rupesh et al, [10] found that, between the two premolars was the most common location.

In children it is present near the alveolar crest, with eruption of teeth it shifts midway between the crest and lower border. In adults it is near the inferior border. With alveolar bone resorption, it moves toward the alveolar crest.

Foramina other than the mental foramen are called as accessory mental foramen. Separation of mental nerve into various fasciculi before formation of mental foramen until 12th gestational week is suggested as a probable cause of accessory mental foramina.[11] Double, triple, multiple as well as absent of mental foramen has been reported in literature. Incidence varied among various ethnic groups. According to Hasan it varies from 1.4% in white American to 9.7% in Melanesians.[12] Al-khateeb et

al [8] found AMF in 10% of cases where as Naitoh et[11] al in 7%. Gershenson et al[13] found 4.3% prevalence of double foramina and 0.7% prevalence of triple foramina. Katakami[14] in their study of 150 mandibles found 16 dual foramens and one triple foramen. Ramadhan et al[15] found triple foramen while operating a patient. Budhiraja[16] found it to be 6.6%. Gupta et al[17] found accessory mental foramen in 8 out of 120 mandibles. Verma reported a unilateral case of accessory mental foramen.[18] Feritas et al[19] and Hasan et al[20] reported cases of absence of mental foramen. They attributed the absence to either of atrophy, post trauma fibrosis, osteoblastic hyperplasia and geriatric bone resorption.[12] In current case the small buccal pinpoint foramen can be either a nutrient canal as its course is seen parallel to similar small canals (Fig. 5). And geriatric bone resorption could be the cause for its absence. The lingual position of the mental foramen is the unique presentation which has not been reported in literature until now. The cause for it may be developmental anomaly.

Mental foramen is of great clinical significance during anaesthetic nerve block, osteotomy procedures, fracture, apical surgery, implant placement, complete denture fabrication[2, 3] etc. Its precise location is important is delivering mental nerve block. Presence of accessory foramen or absence of foramen may result in inadequate mental nerve block. In current case there are higher chances of failure to achieve mental nerve block and higher nerve block like inferior alveolar nerve block may be indicated.

The position is also significant in relation to implant placement.[21] Dental implant should be ideally 2 mm away from the foramen. Impingement of dental implant on mental foramen can lead to paraesthesia of lower lip, gingiva and part of face supplied by mental nerve. In current case, the position is highly significant as the main indication for scan was implant placement. Generally, due to buccal position of the foramen, clinicians provide lingual inclination. In this case lingual inclination may lead to impingement on mental foramen. The CBCT scan helped in locating the anomaly and the treatment was planned accordingly.

Other clinical significances include orthognathic surgeries, para-symphysis fracture, denture construction in edentulous patients, endodontic apical surgeries in premolar region. Care needs to be taken to avoid damage to mental nerve during these procedures.

Conclusion

Variations in the position and number of mental foramen can occur. Hence, it is of utmost importance to know its number and location if any surgical procedure in the premolar or para-symphysis region is indicated. Radiologic evaluation can help in locating the foramen and determining the treatment plan. CBCT can provide most accurate information regarding the position, as well as the number of mental foramen. And as seen in the current case, it can alter the treatment plan.

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Legend Figures

Figure 1: Abnormal mental foramen on left side.

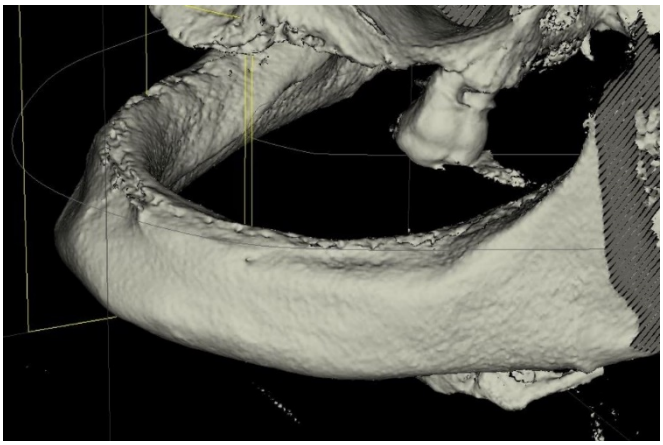

Figure 2: Small opening on left buccal side suggestive of nutrient canal on tangential para-axial section.

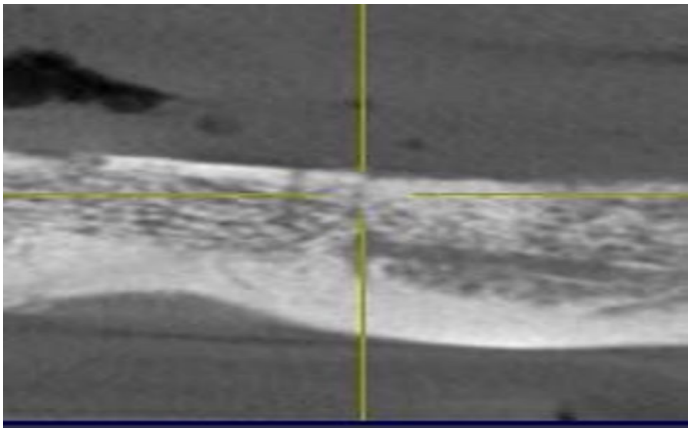

Figure 3 : 3D view showing round opening seen on left lingual side.

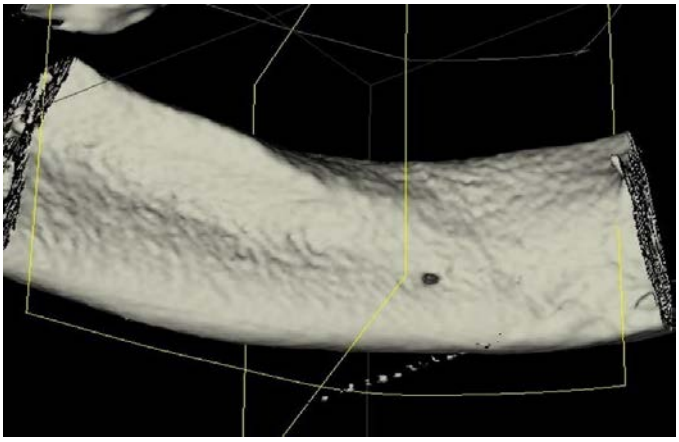

Figure 4: Cross-section showing opening seen on left lingual side.

Figure 5 : 3D image of right side showing normal position of mental foramen.