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Case report

Radix Entomolaris in Mandibular Third Molar and Clinical Challenges: A Case Report

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Permanent mandibular third molars are known to have two distinct mesial and distal morphological roots. However, there might be some discrepancies in their roots number. An additional root located mesiobuccally is called radix paramolaris (RP) while the distolingually placed one is called radix entomolaris (RE). Worldwide, RE is more common than RP. The pathogenesis of the third root occurrence in the mandibular molar is still hazy. Unawareness of the number, position, and morphology of the roots of mandibular third molars might greatly impact the extraction of this tooth which could result in serious surgical morbidity. Therefore, the aim of this paper is to present a rare case of a Nigerian patient with three rooted mandibular third molar.

Keywords: Permanent mandibular third molar, radix entomoralis, additional third root, root morphological variation, three rooted mandibular molar

Anatomic variations in permanent mandibular molars are uncommon in Africans but its prevalence has been well documented especially in Asians, Eskimos, and native American populations (1-5). Permanent mandibular third molars (M3M) like their other molar counterparts are known to have two distinct morphological roots mesial and distal (1). Sometimes, the number of their roots could be unpredictable, and there might be some discrepancy in different individuals (1, 6, 7). An additional root located mesiobuccally is called radix paramolaris (RP) while the distolingually placed one is called radix entomolaris (RE) (8). Worldwide, RE is more commonly observed than RP (3-5).

The pathogenesis of the third root occurrence in mandibular molar is still hazy (3, 4, 9). While some have attributed its formation like that in dysmorphic supernumerary roots to external causes that happened at some point during odontogenesis, others blamed it on penetrance by atavistic gene (atavism is the reappearance of a trait after several generations of absence), or polygenetic system (10). However, in eumorphic roots, racial/genetic factors have been speculated as facilitating the phenotypic expression of this gene (3, 9).

Consequently, the unawareness of the number, position and morphology of the roots of M3M might greatly impact the extraction of this tooth which could result in serious surgical morbidity (11). Therefore, the aim of this paper was to present a rare case of a Nigerian patient with three rooted mandibular third molar. To the best of our knowledge this is the first report from our centre and region.

Case report

A 23 years old female patient reported to dental department in our hospital, Usmanu Danfodiyo University, with two weeks history of

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Figure 1. Mandibuar third molar showing three apices.



Figure 2. Mandibular third molar showing three roots.

toothache in the lower left quadrant. There was associated swelling, difficulty in swallowing, and inability to open mouth for 4 days duration.

On examination, there was a diffuse swelling on the lower left side of the face extending down to submandibular space and posteriorly to angle of mandible; hallitosis and inadequate mouth opening.

Postero-anterior radiograph view of mandible was taken owing to inability of the limited mouth opening for intra-oral periapical radiograph which revealed bilateral mesially impacted lower molars with radiolucency in the left crown.

A clinical diagnosis of mesially impacted third molar was made, and surgical extraction was planned.

Local anaesthetic (2% xylocaine with 1:200,000 adrenaline) was given using Vazirani-Akinosi closed mouth technique due to inadequate mouth opening. Using coupland elevator, the tooth was successfully removed, and three roots were discovered (figures 1 and 2). Post-operative review and follow up were uneventful.

Discussion

There is a conflict regarding the sex variation of this malformation while previous studies have demonstrated higher prevalence in males, others have not found any gender predilection (5, 12). Relatively, in this study a female was implicated.

There is a wide ethnic and racial variation of RE with earlier reports establishing this anomaly to be more common in people of mongoloid descent such as Chinese, Taiwanese and Korean with this anomaly considered as eumorphic among this mongoloid race (2, 6, 7). On the other hand, low prevalence has been recorded among Eurasians, Caucasians, Indians and those populations of African descent (1, 3, 4). The present case seems to point in this direction as the patient was a Nigerian of African descent.

RE have been previously observed in the first, second, and third mandibular molars but with the least occurrence in the second molar (3-5). In the present report, this was found in M3M.

Some studies reported the anomaly to be more on the right, while in other studies the left was more involved (3, 4, 12). The tooth in question was on the left in the present report.

Gbotolorun and colleagues disclosed that the number and morphology of the roots plays a significant role in the difficulty of surgical removal (13). Increase in the number of roots and tortuousity makes the surgical extraction more challenging, hence, the pre-operative knowledge of this abnormality would have equip the clinician to better plan for seamless removal and possible intra and post-operative sequelae (11, 13). In our current report, this was an impacted third molar in a patient

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in the 3rd decade of life; only two roots were detected pre-operatively using extra-oral postero-anterior radiograph of the mandible owing to limited mouth opening and non-availability of orthopantomogram. This is in agreement with the findings by Walker and Quackenbush (1985) showing that in 10% of third molars the third root might not be discovered either as a result of slender dimensions or the two dimensional nature of the X-ray (14). In the absence of this facilities, Arun and others however, showed that parallax technique by mesial or distal angulation of the intra-oral periapical radiograph to 20° to 30° (Parallax rule) could help revealing the extra root according to same lingual, opposite buccal rule/Clark's rule/Walton's projection (3-5).

Spiral conventional computer tomography (SCT) and Cone beam CT (CBCT) are more suited to show accurate and detailed three dimension image of the M3M. The SCT have the disadvantage of high radiation exposure dosage and claustrophobia which is obviated by CBCT (3-5, 12). However, both might not be easily practicable in many settings due to the high cost of acquisition, maintenance and patient affordability (11).

The supernumerary root in the present report had a normal morphology and length in comparison with past reports of variation from short conical to normal length (1,3).

Owing to the immense surgical challenge posed by RE in M3M with more than two roots, extraction under general anesthesia might be indicated especially were theatre space and finances are not an issue (11). In resource depleted health system of sub-Saharan Africa, financial and infrastructural barriers have been incriminated in the optimal delivery of dental services across Nigeria (15).

In conclusion, variations and developmental anomalies of teeth should be carefully examined by the physician to best achieve optimal treatment plan. Permanent mandibular third molar tooth with RE poses significant challenges during treatment. Three dimensional image modalities like SCT and CBCT is highly recommended to show this irregularity pre-operatively.

Conflict of interest

The authors declared no conflict of interest.

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