



Case Report

An unusual impaction of the permanent mandibular first molar – Report of a rare entity

Nagaveni NB^{1*}, Tuhin Gupta², Sumedha Arikady³, Umashankara KV⁴

¹Dept. of Pediatric and Preventive Dentistry, Garike Dental Care, Davangere, Karnataka, India

²Pediatric Dental Practitioner, Pune, Maharashtra, India

³Private Practitioner, Bangalore, Karnataka, India

⁴Dept. of Oral and Maxillofacial Surgery, Garike Dental Care, Davangere, Karnataka, India

Abstract

All dental practitioners and specialist can come across wide array of dental anomalies, variations and disturbances in their routine dental practice. A thorough knowledge and occurrence of such unusual dental variations is highly warranted to meet meticulous diagnosis and render appropriate treatment and justice to the patient. The present paper aims to enlighten the dental readers as well as researchers about the occurrence of an uncommon dental variation found in an Indian male patient. On following clinical examination, the mandibular first molar found clinically missing and hence patient was subjected to radiographic examination which revealed deep bony impaction of the first molar. Literature pertaining to impaction of mandibular first molar is been discussed in this research paper.

Keywords: Dental anomaly, Ectopic eruption, Impaction of the tooth, Mandibular molar, Permanent first molar.

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1. Introduction

Human tooth exhibits an array of malformations if development get disturbed during embryogenesis.^{1,2} Permanent mandibular first molar is the first key tooth erupting in the oral cavity at the age of 6 years of an individual. The most common dental disturbances and ailments affecting this tooth are the early dental decay, variation in cusp number and shape, ectopic eruption and impaction.¹⁻⁵ Among these, impaction of the mandibular first molar is an extremely rare phenomenon reported with scanty published reports.³⁻⁵ Impaction involving third molar is the frequently observable dental finding with rare instances of permanent first molar getting impacted. Extensive review of available dental literature reflected paucity of research publications confined to this domain. **Table 1** shows elaborative description of available papers in the PUBMED search pertaining to the impaction of permanent mandibular first molar.³⁻¹⁵ There are no studies showing prevalence of

impacted mandibular first molars in different ethnic group or population across the globe. The articles published so far contains either case reports or series of cases. This shows requirement of a greater number of prevalence studies among various population group to showcase the exact prevalence so that researcher can draw clinical guidelines for the management of same. Detailed recording and publications of such rare dental structures affecting human race is highly essential to shed more light on the dental anomalies' literature which will further help for the meticulous diagnosis and proper management of such rare cases. The obtained research information can be incorporated in the text books and dental atlas to delineate more information to the readers, students, researchers and academicians. With this brief background, the present research paper strives to enlighten the researchers by presenting an uncommon dental variation occurring in the permanent mandibular first molar. The intention of this paper

*Corresponding author: Nagaveni NB
Email: nagavenianurag@gmail.com

is also to alarm all dental practitioners about the possibility of development of such dental variation which will challenge both diagnosis as well as treatment strategy.

2. Case Report

A 16-year-old female patient belonging to Indian ethnicity reported to a private dental clinic complaining of missing teeth in the lower right back teeth region. On clinical examination patient had normal built and structure with well-behaved behaviour. There were no any signs and symptoms suggesting any systemic, metabolic, genetic or syndromic conditions. On intraoral examination clinically missing mandibular right first molar, second molar and second premolar teeth was observed. In other quadrants all teeth

were present. Suspecting the clinical condition patient was made to undergo radiographic examination by advising cone-beam computed tomography. Following cone-beam computed tomographic scan, mandibular right first molar found to be impacted associated with unerupted second premolar and second molar (**Figure 1** and **Figure 2**). No other dental pathology was observed. The **Table 2** shows detailed description of the case consisting of impacted permanent mandibular first molar. As impacted first molar was obstructing the eruption of second molar and second premolar, surgical extraction of the impacted first molar followed by orthodontic pulling of the second premolar and second molar was planned.

Table 1: Evidence based illustration on impaction of the permanent mandibular first molar

S. No.	Author/Year	Country Published	Impacted Molar	Journal Name
1	Paleczny et al/1991 ¹³	-	Right molar	Journal of Canadian Dental Association
2	Lee et al/2010 ⁶	China	Right molar	Journal of Korean Academy of Pediatric Dentistry
3	Joshi et al/2011 ⁴	India	3 cases Left molar	Contemporary Clinical Dentistry
4	Fu et al/2012 ⁵	Taiwan	Right molar	Angle Orthodontist
5	Wilson et al/2013 ¹²	-	Bilateral	Pediatric Dentistry
6	Kwon et al/2016 ⁸	China	Right molar	Pediatric Dentistry
7	Konstantina et al/2019 ¹⁰	-	Left molar	Dental Journal (Basel)
8	Sun et al/2019 ¹⁴	China	Right molar	Hua Xi Kou Qiang Yi Xue Za Zhi (Chinese journal)
9	Morita et al/ 2020 ⁹	Korea	Left molar	Korean Journal of Orthodontics
10	Sonpal et al/2022 ³	India	Right molar	Cureus
11	Ishiyama et al/2024 ¹	Japan	Left molar	Cureus

Table 2: Detailed description of the case constituting variation in permanent mandibular first molar

Age/Gender	Ethnicity	Chief Complaint	Clinical Features	Radiographic Features
16 years/Female	Indian	Missing teeth in the lower right back teeth region	Clinical absence of permanent mandibular right first (46) and second molar (47) and second premolar (45)	See Figure 1 and Figure 2

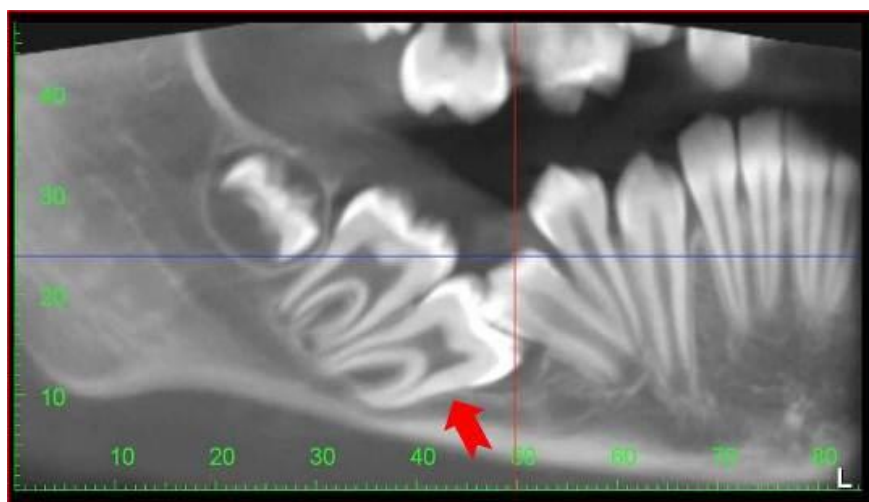


Figure 1: CBCT Scan showing mesial impaction of permanent mandibular right first molar (red arrow)

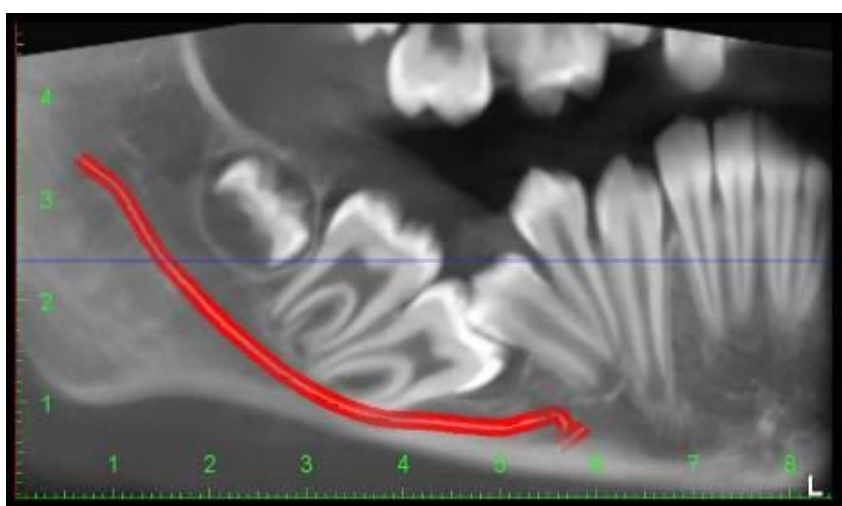


Figure 2: CBCT image showing relation of mandibular canal (red line) to the roots of impacted permanent mandibular first molar

2.1. Radiographic features (*Figure 1 and Figure 2*)

Patient was subjected to thorough radiographic examination using cone beam computed tomography. In the CBCT scan the permanent mandibular right first molar was found located below the level of occlusion and was inclined mesially to the level of the right second premolar tooth. The mesial root was inferiorly placed and curved. The crown morphology was found normal and the root formation was completed with evidence of complete apical closure. The crown of 45 rested on the occlusal surface of first molar which was also found inclined distally. The first premolar tooth was found in the line of occlusion and was inclined distally to the position of the tooth canine. The crown morphology appeared normal and root formation was completed. The tooth second molar was found below the level of occlusion and was inclined mesially to the position of the first molar. The crown and root morphology found normal and root formation was incomplete with open apex.

The mandibular canal was found inferiorly located well below the root of first and second left premolars. However,

the mesial and distal root of first molar was found brushing the mandibular canal. There was no evidence of ankylosis of the root pertaining to the first molar. The CBCT scan also exhibited developing third molar tooth bud distal to the second molar. Based on both clinical and radiographic findings and considering the chief complaint of the patient, surgical removal of the impacted first molar followed by orthodontic traction of the second premolar and second molar to bring these two teeth to the proper occlusal level was planned and patient was explained in detail about the treatment plan.

3. Discussion

Although tooth impaction affects majority of the population, impaction of the first permanent molar is extremely rare with recorded prevalence of 0.01%.³⁻⁵ Literature review revealed countable number of publications showing impaction of the mandibular first molars. There are no prevalence studies comprising large sample population showing the prevalence of impaction of the mandibular first molar. Only few case reports and case series have been published. Among the 11

cases published so far, it was noticed that there was no side predilection of occurrence of mandibular first molar impaction and no gender predilection. Only one publication showed bilateral occurrence and most publications are reported from China with only two reports recorded by India. This reflects the essentiality of huge number of prevalence studies to be required in the dental science literature to make precise protocols on diagnostic, therapeutic and preventive parameters pertaining to impaction of the mandibular first molars. Impaction of the permanent mandibular first molar when occurs is usually observed in the mixed dentition stage.¹² As this tooth erupts at the age of 6, any delay in eruption beyond the speculated time should be suspected and the case should be studied in detail using all appropriate diagnostic methods including both conventional and advanced radiographic modalities such as cone beam computed tomography.^{16,17} It is also important that this condition requires early diagnosis followed by early intervention to avoid development of future complications. As we all know, permanent mandibular first molar is the key tooth essential for the development of proper occlusion and facial growth.¹² Therefore, any disturbance in its eruption results in wide range of clinical complications like extrusion of the opposite tooth, development of cysts or tumor malformations, decrease in vertical dimension and inclination or resorption of the neighbouring teeth.¹¹ Different methods of treatment are mentioned for management of this dental variation like orthodontic traction, surgical removal or periodic observation.¹¹ In the present case as the first molar was badly impacted with severe mesial inclination obstructing the eruption path of second premolar and second molar and found close to the mandibular canal, surgical removal of the impacted first molar was planned followed by orthodontic pulling of the unerupted second premolar and second molar into the proper occlusal level to establish normal vertical dimension.

Cone beam computed tomography is the advanced and innovative diagnostic tool which provide three-dimensional view of the anatomic structure.¹⁶⁻²⁰ In the present case using this innovative aid, it was possible to evaluate the position of the impacted first molar, the status of the second and third molars and second premolar including the crown morphology and root anatomy, the relationship of the first molar roots with the adjacent anatomic structures like mandibular canal and possibility of presence any pathology. Because it is well reported that most of the impacted teeth are found with associated dental pathologies like cysts or tumor malformations.

Occurrence of impacted mandibular first molar is a rare entity. When it happens, it leads to many clinical complications as mentioned above. There is no exact etiology behind the mandibular first molar getting impacted. Literature shows this may be due to interplay of multifactorial factors including environmental and genetic factors. These multifactorial etiologic factors can be listed as bony

obstruction, pathologic factors like cyst or tumors associated with it, adjacent teeth obstructing the eruption and delayed root formation or maturation. Therefore, it is highly essential to rule out these etiological factors before diagnosing and providing treatment modalities. Regarding treatment of the impacted mandibular first molars, either surgical extraction or intervention procedures including surgical opening followed by orthodontically moving the impacted tooth to the proper occlusal level has been suggested by different researchers based on the condition of the impacted tooth.

4. Conclusion

The present case presentation strictly warns all dental practitioners that whenever a clinician come across any patients presenting delay in eruption of permanent teeth or deviation in eruption of the tooth or any missing tooth in the oral cavity, one should suspect presence of hidden real truth in order to arrive at early diagnosis and to render appropriate treatment. This not only avoids development of future complications but also helps patient as well as parents not to suffer from burden of the exhaustive, long treatments including the cost.

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None.

6. Conflict of Interest

None.

References

1. Ishiyama M, Namaki S, Tamura H, Hase K, Kikuri T. Impaction of mandibular first molar by tooth-like hard tissue. *Cureus*. 2024;16(4):e59304. <https://doi.org/10.7759/cureus.59304>.
2. TenCate AR. Oral Histology: Development, structure and function. 4th ed. Toronto: CV Mosby; 1989.
3. Sonpal PM, Mundada BP, Bhola ND, Kamble R, Mathew J. Impacted mandibular first molar: a rare riddle. *Cureus*. 2022;14(11):e31680. <https://doi.org/10.7759/cureus.31680>.
4. Joshi M, Kasat V. Variations in impacted mandibular permanent molars: report of three rare cases. *Contemp Clin Dent*. 2011;2(2):124–6. <https://doi.org/10.4103/0976-237X.83079>.
5. Fu PS, Wang JC, Chen CH, Huang TK, Tseng CH, Hung CC. Management of unilaterally deep impacted first, second, and third mandibular molars. *Angle Orthod*. 2012;82(3):565–71. <https://doi.org/10.2319/062411-409.1>.
6. Lee DY, Song JS, Lee JH, Choi BJ, Kim SO. Eruption guidance of impacted mandibular first molar. *J Korean Acad Pediatr Dent*. 2010;37:226–32.
7. Nagaveni NB, Ashwini KS. Impaction of primary molars in Indian children – a retrospective radiographic study and upgraded new classification system. *Clin Radiol Ima J*. 2024;8(1):000217. <https://doi.org/10.23880/crij-16000217>.
8. Kwon SO, Lee S, Lee N. Treatment of combined primary impaction of primary second molars and permanent first molars. *Pediatr Dent*. 2016;38(7):143–7.
9. Morita Y, Koga Y, Nguyen TA, Yoshida N. Biomechanical considerations for uprighting impacted mandibular molars. *Korean J Orthod*. 2020;50(4):268–77. <https://doi.org/10.4041/kjod.2020.50.4.268>.
10. Tsironi K, Inglezos E, Vardas E, Mitsea A. Uprighting an impacted permanent mandibular first molar associated with a dentigerous cyst

- and a missing second mandibular molar-a case report. *Dent J (Basel)*. 2019;7(3):63. <https://doi.org/10.3390/dj7030063>.
11. Tamer İ, Öztaş E, Marşan G. Up-to-date approach in the treatment of impacted mandibular molars: a literature review. *Turk J Orthod*. 2020;33(3):183–91. <https://doi.org/10.5152/TurkJOrthod.2020.19059>.
 12. Machado AW, McComb R, Wu K, Moon W. Early mixed dentition treatment of bilateral impaction of permanent mandibular first molars. *Pediatr Dent*. 2013;35(5):E134–6.
 13. Paleczny G. Treatment of the ankylosed mandibular permanent first molar: a case study. *J Can Dent Assoc*. 1991;57(9):717–9.
 14. Sun CX, Li ZH, Zhou ZQ. Distal horizontal impaction of right mandibular first molar: a case report. *Hua Xi Kou Qiang Yi Xue Za Zhi*. 2019;37(1):106–8.
 15. Moca RT, Moca AE, Juncar RI, Vaida LL, Janosy AM, Juncar M. Prevalence and patterns of positional dental anomalies in first permanent molars: insights from a study in Oradea, Romania. *Diagnostics (Basel)*. 2024;14(13):1460. <https://doi.org/10.3390/diagnostics14131460>.
 16. Patel PS, Shah JS, Dudhia BB, Butala PB, Jani YV, Macwan RS. Comparison of panoramic radiograph and cone beam computed tomography findings for impacted mandibular third molar root and inferior alveolar nerve canal relation. *Indian J Dent Res*. 2020;31(1):91–102. https://doi.org/10.4103/ijdr.IJDR_540_18.
 17. Safi Y, Moshfeghi M, Ahsaie MG, Zameni M, Sahafi SA. Relationship between impacted mandibular third molars and the mandibular canal on CBCT scans. *J Long Term Eff Med Implants*. 2024;34(3):65–74. <https://doi.org/10.1615/JLongTermEffMedImplants.2022042569>.
 18. Hung KF, Yeung AWK, Wong MCM, Bornstein MM, Leung YY. Comparing standard- and low-dose CBCT in diagnosis and treatment decisions for impacted mandibular third molars: a non-inferiority randomised clinical study. *Clin Oral Investig*. 2024;28(12):647. <https://doi.org/10.1007/s00784-024-06022-5>.
 19. Dias MJ, Franco A, Junqueira JL, Fayad FT, Pereira PH, Oenning AC. Marginal bone loss in the second molar related to impacted mandibular third molars: comparison between panoramic images and cone beam computed tomography. *Med Oral Patol Oral Cir Bucal*. 2020;25(3):e395–402. <https://doi.org/10.4317/medoral.23443>.
 20. Zambrano-De la Peña LS, Aliaga-Del Castillo A, Rodríguez-Cárdenas YA, Ruiz-Mora GA, Arriola-Guillén LE, Guerrero ME. Bucco alveolar bone thickness of mandibular impacted third molars with different inclinations: a CBCT study. *Surg Radiol Anat*. 2020;42(9):1051–6. <https://doi.org/10.1007/s00276-020-02447-1>.

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