

Nonsyphilitic occurrence of mulberry molars: A rare case report

Anila Koneru, Santosh Hunasgi, Vardendra Manvikar, M Vanishree

Department of Oral and Maxillofacial Pathology, Navodaya Dental College and Hospital, Raichur, Karnataka, India

Abstract

Developmental defects of enamel may range from slight abnormalities of the tooth's color, shape and size to a complete absence of the enamel. Permanent first molar may show large variations in their morphological features and forms. Such changes may be in the form of anomalous cusps or variations in the occlusal surface showing globular shaped additional cusps and also increased in number of roots. However, to the best of our knowledge, this is the first nonsyphilitic case with the occurrence of multiple globular cusps. In the present case, occlusal anatomy is abnormal, with numerous disorganized globular projections involving all four permanent first molars. The projections of 2 mm × 2 mm in size and globular in shape were seen in the maxillary and mandibular cast. The features resemble the surface of mulberry and hence diagnosed as mulberry molars.

Keywords: Globular cusps, molar, mulberry, occlusal, permanent, syphilis

Address for correspondence: Dr. Anila Koneru, Department of Oral and Maxillofacial Pathology, Navodaya Dental College and Hospital, Raichur - 584 103, Karnataka, India.

E-mail: anila.koneru@gmail.com

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INTRODUCTION

Enamel is produced only during a certain phase of the tooth development and is irreplaceable. Ameloblasts, which are secretory cells that produce enamel, are mostly susceptible to changes in their environment throughout the extensive process of enamel production. Dysfunction of ameloblasts may occur resulting in changes in the manifestation of the enamel in the permanent dentition. These developmental defects of enamel (DDE) may range from slight abnormalities of the tooth's color, shape and size to an absolute absence of the enamel.^[1]

The first permanent tooth to commence calcification is the first molar. This occurs around the time of birth, while the anterior teeth commence calcification between

4 and 6 months of age in a chronological order from the central incisor to the canine. At around 6 years of age, the first permanent molar tooth begins to erupt into the oral cavity, and by the age of 14 years, most of the children have all of their permanent teeth erupted except for their third molars. Many factors have been implicated in the etiology of DDE in the permanent first molar tooth.^[2]

The permanent first molar may demonstrate huge variations in their morphological features and forms. Such changes may be found in the crown either in the form of anomalous cusps and variations in the occlusal surface showing globular-shaped additional cusps or in an increased number of roots.^[3] However, to the best of our knowledge,

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this is the first nonsyphilitic case with the occurrence of multiple globular cusps resembling mulberry molars.

CASE REPORT

A 7-year-old boy was seen at the dental clinic in Raichur, for a general checkup of his teeth. His medical and personal history was noncontributory. Extraoral examination revealed right submandibular lymphadenopathy. Oral examination revealed a generalized mild inflammatory gingival enlargement with mild calculus seen anteriorly. No soft-tissue abnormalities were found. On careful clinical examination, additional cuspal projections were seen on the occlusal surfaces of the right and left maxillary and mandibular permanent first molars [Figures 1 and 2]. The projections of 2 mm × 2 mm in size and which are globular in shape were seen in the maxillary and mandibular cast. The occlusal surface resembled mulberry molars of congenital syphilis [Figures 3 and 4].

Intraoral periapical radiographic examination of all the four permanent first molars showed external irregular cuspal projections seen on the occlusal third of tooth. Permanent tooth buds were noticed below the primary molars [Figure 5].

The opposing teeth conformed well in occlusion with these cuspal projections. No evidence of caries was noted in the grooves of these cusps. Neither the siblings nor the parents had been reported with such abnormalities. The patient’s mother neither had fever during pregnancy nor any history of suffering from syphilis.

In view of the late congenital syphilis, further investigations were carried out under the guidance of a pediatrician. The routine blood investigations revealed normal Hb%, total leukocyte count, differential leukocyte count and platelet count. Venereal Disease Research Laboratory (VDRL)



Figure 1: Intraoral clinical photograph showed additional globular cuspal projections seen on the occlusal surfaces of the right and left maxillary permanent first molars



Figure 2: Intraoral clinical photograph showed additional globular cuspal projections seen on the occlusal surfaces of the right and left mandibular permanent first molars



Figure 3: Maxillary cast showing projections which are 2 mm × 2 mm in size and globular in shape

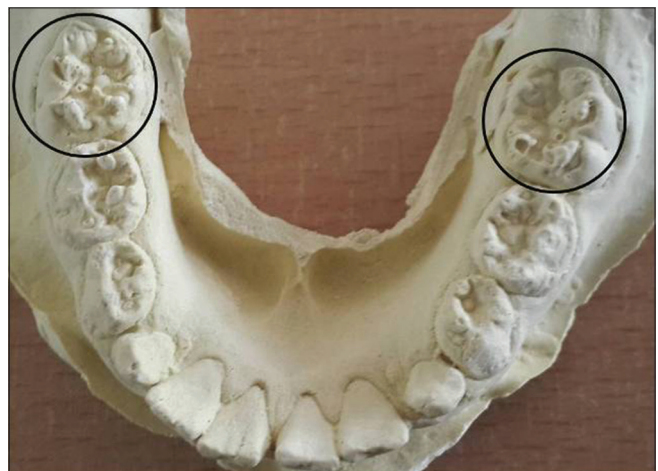


Figure 4: Mandibular cast showing projections which are 2 mm × 2 mm in size and globular in shape



Figure 5: Intraoral periapical radiographic examination of all the four permanent first molars showed external irregular cuspal projections seen on the occlusal third of all permanent first molars. Permanent tooth buds were noticed below the primary molars

test (screening test) was nonreactive, and *Treponema pallidum* hemagglutination (specific test) was negative.

The child was cooperative in the dental operatory. All the additional cusps were rounded, and topical fluoride application was performed. The patient underwent prophylaxis for mild inflammatory gingival enlargement and followed up periodically.

DISCUSSION

In the present case, occlusal anatomy is abnormal, with numerous disorganized globular projections involving all four permanent first molars. The features resemble the surface of mulberry and hence diagnosed as mulberry molars.

Mulberry molars are a dental condition typically linked with congenital syphilis, characterized by multiple rounded rudimentary enamel cusps on the permanent first molars. Mulberry molars are actually defective permanent molars. This type of abnormality is characterized by dwarfed molars with cusps covered with globular enamel growths. Just above the cervical line, i.e., in the cervical and middle third, the mulberry molar looks normal. A deformity becomes apparent toward the cuspal or occlusal surface of the tooth. The size of the mulberry molar is diminished in all aspects, creating a stumpy version of a conventional molar.^[4]

The cause of the molar atrophy seen in mulberry molars is considered to be enamel hypoplasia or a deficiency in tooth enamel. The underlying dentin and pulp of the tooth are normal, but the enamel is thin and deformed. Normally, the occlusal surface of a molar has a pits and grooves. The

cuspal deformity of the mulberry molar is characterized by an extremely shallow or completely absent pits. As an alternative, the pit area is crammed with globular structures bunched together all along the occlusal surface of all four permanent molars.^[4,5]

A mulberry molar is usually seen or most often caused by congenital syphilis, which is passed from the mother to the child in the uterus through the placenta. Since this particular symptom of congenital syphilis manifests later in childhood with the eruption of the permanent molars, it is a late-stage marker for this disease.^[5]

The present case reports the occurrence of mulberry molars involving all first permanent molars in a 6-year-old male patient. The patient's mother neither gives any history of fever nor syphilis during pregnancy. VDRL test and *T. pallidum* hemagglutination test were negative. Thus, the etiology behind such presentation is almost certainly related to local, systemic, genetic or environmental factors, most likely to be multifactorial in nature.

Defects on a single tooth or only a few teeth propose a local etiological factor, for example, a defect in a permanent tooth due to damage (trauma or infection) to its primary predecessor. Alternatively, a systemic factor (both short and long term) may affect all the teeth that are developing during the time of the insult and lead to what is described as a chronological defect. Defects caused by genetic factors are most often (although not always) generalized in distribution, affecting both the primary and permanent dentitions.^[1,2]

Amelogenesis is genetically controlled though it is very sensitive to diverse environmental disturbances. Local factors, systemic factors and infection of enamel organs can lead to the damage or destruction of ameloblasts. Inflammation around the tooth germ can alter enamel formation in two main ways as follows: (a) as minor or moderate hypoplastic defects and (b) as hypoplastic disturbance with morphological distortions. The former can occur in many teeth and in any period of enamel formation ensuing in nonspecific hypoplastic defects, while the latter can occur due to stronger pressure on the early tooth bud and during tooth morphodifferentiation resulting in the modification of its shape. These hypoplastic abnormalities influence only precise teeth at distinctive locations.^[6,7]

Lauc *et al.*, 2015 has postulated that enamel hypoplasia seen in congenital syphilis includes Fournier's canines and mulberry molars occur mostly, but not uniquely in

congenital syphilis. Therefore, Fournier's canines and mulberry molars are not defined as pathognomonic to congenital syphilis even though highly indicative of this condition.^[7]

Sedano *et al.*, 2009, reported a case of 15-year-old female patient with five dens invaginatus along with permanent mandibular left mulberry molar, molarization of some premolars, several microdontic conoid teeth, retention of five primary teeth, absence of several permanent teeth germs, a macrodontic molar with abnormal roots and several periapical radiolucencies associated with dens invaginatus.^[8]

Rodrigo *et al.*, 2012, reported a case of 31-year-old female patient presented with a severe interscapular pain radiating from the back to front of the chest. She also complained of hemoptysis and bilateral lower-limb weakness. On oral examination, Hutchinson's teeth such as abnormalities of the upper jaw incisors were obvious. She was extensively investigated regarding an etiological explanation for the massive dissection. There were no conclusive findings. The obvious clinical finding of a Hutchinson's teeth such as deformity of the upper incisors raised the possibility of congenital syphilis. Yet, the history did not reveal any clues to suggest this, and the *T. pallidum* particle agglutination test was negative in both the patient and her mother ruling out the possibility of congenital syphilis.^[9]

Afshar *et al.*, 2003, reported that enamel hypoplasia or hypocalcification of the first permanent molars is more common in infants born in the cesarean section delivery (C/S) than those born in normal vaginal delivery. However, in the present case, the patient's mother gives a history of C/S at 9th month of pregnancy. Thus, the present case which was not associated with syphilis but showing the features of mulberry molars involving only permanent molars can be considered as nonsyphilitic occurrence of mulberry molars.^[10]

Mulberry molars are typically functional and do not need any treatment. If the deformity is severe, there are several cosmetic options. The teeth can be covered with a permanent cast crown, or the molars can be removed, and an implant or bridge can be put in place of the mulberry molar.^[4] However, in the present case, all the additional cusps were rounded, occlusal relationship was made proper with no obstruction seen, all the molars were free of dental caries, topical fluoride application was performed and periodic observations were done.

CONCLUSION

The dental findings seen in this case is certainly rare and differs from previously reported cases. The case is also complicated, with no history of congenital syphilis. This case report is the first case of mulberry molars which is of nonsyphilitic type. From this case report, it is recommended that gynecologist, pediatrician should be provided with essential information about the first permanent tooth formation and the consequences seen if there are any disturbances during cesarean section of delivery. Thus preventing the anomalies affecting permanent first molar which is considered to be the key of occlusion.

From this case report, it is recommended that gynecologist, pediatrician should be provided with essential information about the first permanent tooth formation and the consequences seen if there are any disturbances during cesarean section of delivery. Thus preventing the anomalies affecting permanent first molar which is considered to be the key of occlusion.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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