

# Oral and Maxillofacial Surgery Filled with Surprises: An Intriguing Case of Impacted First Molar

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## ABSTRACT

Tooth development happens due to a complicated cascade of interaction between the oral epithelium and the underlying mesenchymal tissue. Abnormal tissue interactions during tooth development may lead to abnormal pattern of tooth development and eruption. We report a rare case of unerupted first molar accidentally diagnosed on conventional radiograph and an effort is directed to review possible causes of non-eruption of teeth and their treatment. It is of utmost importance for the patient that the clinician diagnose and treat eruption disturbances at the earliest, so as to prevent the malocclusion to develop which complicates further treatment and leads to poor prognosis.

**KEYWORDS:** Impaction, First Molar, Mandibular Impaction

## INTRODUCTION

Eruption is a biological phenomenon, which includes the axial movement of a tooth from its developmental crypt within the jaw towards the functional position in the occlusal plane. The occlusal harmony of the first and second permanent molars is especially important for the maintenance of facial growth, and for providing occlusal harmony for mastication.

Eruption is a multifactorial process, whose biological mechanism is unclear. Among the various hypotheses that have been proposed, the root growth and periodontal ligament theories are baseless today as eruption occurs without root formation or presence of periodontal ligament. In more recent studies, the dental follicle theory explains the process of eruption. This organ is considered an mandatory for bone resorption in the eruption path as well as for the formation of bone below the roots.<sup>1,2</sup>

There is an intricate relationship between the eruption of a tooth and its stage of root development. Just after emergence, three- quarters of the roots of the tooth have normally been formed. In the case of lower first permanent molars and central incisors, half the roots have been formed by this time<sup>3</sup>

The eruption of some molars may be delayed, and sometimes may not occur at all. This failure of eruption is interlinked with a plethora of medical conditions<sup>3</sup> Nevertheless, on occasion the failure of eruption of first permanent molars is not associated with any systemic conditions or genetic alterations<sup>4</sup>

Failure of eruption of first and second permanent molars

is rare<sup>5</sup>; the prevalence in the normal population is 0.01% in the case of the first permanent molar.<sup>6</sup> Failure of eruption occurs due to variety of reasons like impaction, primary retention, or secondary retention.

We report a case of a unerupted first molar in the left mandibular arch and an effort is made to elicit possible causes of non- eruption of teeth and their treatment modalities.

## CASE REPORT

A 28- year old man with excellent general health reported to the department of oral and maxillofacial surgery for a routine dental check- up. On intraoral examination, a mesial inclined second molar is seen in the mandibular left quadrant with the cusp of first molar visible but in infra-occlusion. No history of trauma or previous infection to affected areas was specified. Medical and family histories were non-contributory, and the general examination revealed no syndrome or metabolic disorder affecting the physiological and functional harmony of the patient.

A panoramic radiograph (fig.1) showed a mesial inclined second molar with first molar placed in between the second premolar and the second molar. The distal cusp of first molar is below the cervical constriction of the second molar and the first molar also has dilacerated roots with a distal curvature. Our treatment plan included surgical exposure of the tooth using an anterior releasing incision and then taking the tooth out using trans alveolar method. But surgery in this region always involve the risk of

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injury to the mental nerve as well as facial artery due to their aberrant branching.



Fig. 1: Panoramic Radiograph

## DISCUSSION

The cascade of eruption involves a complex interaction between osteoblasts, osteoclasts, dental follicle along with the tooth germ which results in synchronised alveolar bone resorption and emergence of the tooth in the oral cavity. Teeth may fail to erupt due to the mechanical obstruction, which can be idiopathic or pathologic in origin or because of disruption in the eruptive mechanism itself. The terms "impaction" and "retention" are often used synonymously for eruption failure, but actually they are separate pathologies with different etiology and treatment approaches.<sup>7</sup>

The term impaction originates from a latin word "Impactus". It is defined as disruption of the eruption of a tooth caused by a physical barrier in the eruption path or by an ectopic position of the tooth which can be detected clinical acumen or radiographic interpretation.<sup>8</sup> Common causes leading to impaction are lack of space or crowding of dental arches, premature loss of primary teeth leading to collapse of dental arches, rotation of tooth buds causing dilacerations of roots, supernumerary teeth, odontoma or cyst in the path of eruption.

An impacted tooth is one that is not able to erupt in its proper functional harmony because it is blocked either by tissue, bone or another tooth.

Among the various hypotheses that have been proposed, the root growth and periodontal ligament theories are obsolete today, because eruption occurs even in the absence of root formation and PDL. In more recent studies, the dental follicle theory has gained advocacy. This organ is considered an indispensable requisite for bone resorption in the eruption path as well as for the formation of bone below the roots.<sup>1,2</sup> There is a close association between the eruption of a tooth and its stage of root formation. Usually after emergence, three quarters of the roots of the tooth have already been formed. At the time of eruption of lower first permanent molars and central incisors, half the roots are formed.<sup>3</sup> The eruption of may be delayed, and sometimes may not occur at all. This failure of eruption can be attributed to a variety of medical conditions.<sup>3</sup>

In the oral cavity third molars are more frequently impacted followed by canines. The incidence of impacted first molars is very rare. Multiple impacted teeth may be linked to syndromes such as Cleidocranial Dysostosis, Gardner Syndrome, Yunis-Varon Syndrome<sup>9,10</sup> and metabolic disorders(mucopolysaccharidoses).<sup>11</sup>

According to the classification proposed by Andreasen and Kuroi the failure of eruption of the molar can be classified into three events based on etiology, clinical data and radiographic interpretation<sup>8</sup>:

- Impaction: caused by a physical obstacle, due to a lack of space, and which could result in collision between the follicles of the molars. Ectopic eruption of the tooth germ and obstacles in eruptive path( extra teeth, odontomas , tumors, cysts, giant cell fibromatosis etc) cause impaction
- Primary retention (unerupted and embedded teeth) is defined as a cessation of eruption before gingival emergence without a recognizable physical barrier in the eruption path or ectopic eruption. This kind of eruption failure is sometimes associated with syndromes where osteoclastic activity is compromised.
- Secondary retention: It is also known as submerged, reimposition and ankylosis. It is defined as cessation of the eruption after emergence, without any evidence of a physical barrier either in eruption path or as a result of an abnormal position. Clinically, secondary retention is suspected when tooth is in infraocclusion at an age when tooth would normally be in occlusal harmony. In Radiographic interpretation, a focal disruption of periodontal space or resorption of root surface is usually seen. Secondary retention is more frequent than primary retention and is caused due to a focal area of ankylosis especially in the inter –radicular zone. The origin of ankylosis is attributed to genetic<sup>12</sup> and systemic factors.

It is observed, that a high percentage of permanent molars need to be extracted in cases of failure of eruption, reflecting the fact that the prognosis of this abnormality is still unfavourable. This may be because failure, of eruption is an asymptomatic pathology, which means that it is usually a casual discovery, and its diagnosis is made late<sup>13</sup> as is seen in our case.

The repercussions of impacted first permanent molar on the permanent dentition is immense, which include malocclusions, shortening of the facial height, incomplete development of the alveolar process and risk of root resorption of neighbouring teeth.<sup>14</sup> Previous studies<sup>13</sup> have discussed the failure of eruption of permanent molars in adults and subsequent occlusal disturbances. This study of an exclusively pediatric age group shows that anomalies in neighbouring and opposing teeth, causing malocclusions are frequent and start at a very early age. The authors concluded that, the age of the patient is a key factor in the prognosis of a case. In our

case age was more leading to poor prognosis.

Wellfelt maintains that ankylosis is often suspected in vertically positioned teeth.<sup>15</sup> Nevertheless, the radiographic diagnosis of ankylosis in multi-rooted teeth is very difficult because of overlapping labial and lingual cortical plates<sup>16</sup> and also because ankylosis may be located in a minute area.<sup>17</sup> Because of these limitations, it is an arduous task to diagnose ankylosis, although several ortho-pantomographs suggested its presence. In our case, a marked dilacerations is seen in the roots in the radiograph which usually occurs due to trauma to the tooth during development and may explain its failure to erupt into normal occlusion.

The treatment of failure of eruption of permanent molars depends on several factors, the most important being age. Treatment options include observation, extraction of the obstacle, surgical exposure, luxation and extraction of the unerupted molar.

When failure of eruption is due to an obstacle, the early removal of the barrier usually allows the molar to erupt spontaneously.<sup>19</sup> The usual treatment in cases with a favourable prognosis was surgical exposure and luxation. Molars luxated prior to complete root formation erupted spontaneously and continued their normal root development.

Luxation has proven to be an effective technique with minimal morbidity and good prognosis.<sup>18,20</sup> The prognosis is better than that of dental transplant in which the tooth is removed from its socket causing the apical blood vessels to be compromised. Luxation has been successfully used in ankylosed permanent molars.<sup>17</sup> The potential risks attributed to luxation are pulpal devitalization and root fracture<sup>17</sup>, although a prophylactic endodontic treatment of the luxated molar is not recommended.<sup>18</sup> In our case as the age of the patient is more and the roots are completely formed as well as lack of space for the tooth to erupt into normal occlusion evident from the radiograph with impingement of the first molar onto the roots of the second molar calls for a unfavourable prognosis. Under the following circumstances, the only option left for us is to surgically remove the tooth. The loss of this crucial tooth which is the key to occlusion could have been avoided if the diagnosis had been made earlier (Fig 2)

We advocate that prompt diagnosis is required to improve prognosis and to palliate the aftermath effects associated with failure of eruption of permanent molars. We propose a treatment protocol for the management of these patients based on the type of eruptive abnormality and the age of the patient.<sup>21</sup>

## CONCLUSION

Absence of posterior teeth is an incidental discovery during a dental examination. This implies a late diagnosis of the abnormality and an unfavourable prognosis. In order to prevent this situation, a radiographic examination, ideally during the mixed dentition period

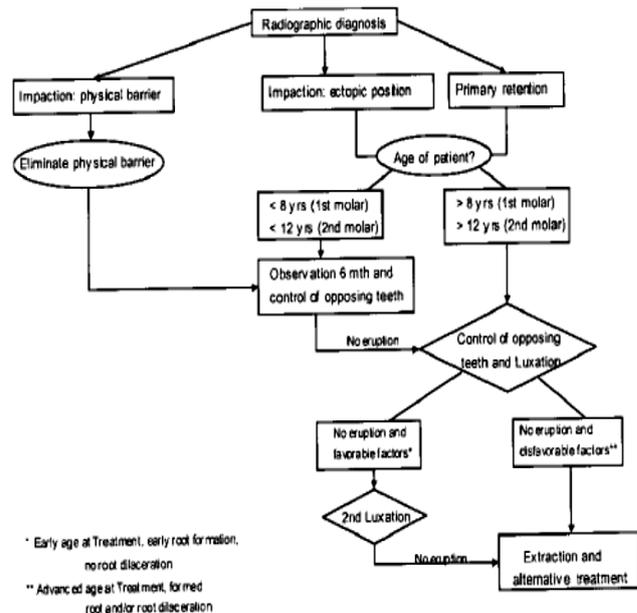


Fig. 2: Flowchart on Diagnosis and Treatment Plan

for early detection of eruption disturbances of permanent teeth is recommended, especially when considering that these abnormalities are associated with high rate of occlusal disturbances and need surgical intervention. Also complete understanding of impaction, primary retention and secondary retention is necessary for differential diagnosis.

## REFERENCES

1. Ten Cate AR. Oral histology: development, structure, and function. 3rd ed. St Louis, CV Mosby, pp 275 – 98, 1989.
2. Raghoebar GM, Boering G, Vissink A, Stegenga B. Eruption disturbances of permanent molar: a review. J Oral Pathol Med 1991;20:159-66.
3. Canut Brusola JA. Ortondoncia clínica y terapéutica. 2000;2nd ed. Barcelona: Masson,25-42, .
4. Kaban LB, Needleman HL, Hertzberg J. Idiopathic failure of eruption of permanent molar teeth. Oral Surg 1976;42:155-63,.
5. Baccetti T.Tooth anomalies associated with failure of eruption of first and second permanent molars. Am J Orthod Dentofac Orthop .2000;118: 608-10.
6. Grover PS, Lorton L. The incidence of unerupted permanent teeth and related clinical cases. Oral Surg Oral Med Oral Pathol1985: 59: 420-25.
7. Raghoebar Gm,Boering G, Vissink A, Stegenga B .Eruption disturbances of permanent molars: a review. Journal of oral pathol med 1991;20:159-166.
8. Manjot Kaur, Single Shefali .Molar Impactions : Etiology, Implications And Treatment Modalities. Journal Of Orofacial Research 2012;2(3):171-173 .
9. Kirson Le,Scheiber Re,Tomaro Aj. Multiple impacted teeth in Cleidocranial Dysostosis. Oral Surg Oral Med Oral Pathol 1982;54:604.
10. Bradley Jf,Orlowski Wa .Multiple Osteomas,Impacted Teeth And Odontomas- A Case Report of Gardners Syndrome. JNJ dent assoc 1977;48:32-33.
11. Nakamura et al. Rosette Formation Of Impacted Molar Teeth In Mucopolysaccharidoses And Related Disorders. Dentomaxillofac radiol 1992;21:45-49.

12. Reid Dj. Incomplete eruption of the first permanent molar in two generations of same family. *Br dent j* 1954;96:272-73.
13. Valmaseda-Castellón E, De-la-Rosa-Gay C, Gay-Escoda C. Eruption disturbances of the first and second permanent molars: Results of treatment in 43 cases. *Am J Orthod Dentofac Orthop* 1999;116: 651-8.
14. Shafer WG, Hine MK, Levy BM. *A textbook of Oral Pathology*. 4th ed. Philadelphia, WB Saunders pp 66-9, 1983.
15. Wellfelt B, Varpio M. Disturbed eruption of the permanent lower second molar: treatment and results. *J Dent Child* 1988;55: 183-9
16. Andersson L, Blomlöf, Lindskog S, Feiglin B, Hammarström L. Tooth ankylosis; clinical, radiographic and histological assessments. *Int J Oral Surg* 1984;13: 423-31.
17. Geiger A.M, Bronsky MJ. Orthodontic management of ankylosed permanent posterior teeth: A clinical report of three cases. *Am J Orthod Dentofac Orthop* 1994;106: 543-8.
18. Pogrel M.A. The surgical uprighting of mandibular second molars. *Am J Orthod Dentofac Orthop* 1995;108: 180-3
19. Jacobs SG. The Surgical exposure of teeth: simplest, safest and best? *Austr Orthod J* 1987;10: 5-11.
20. Owen A. Early surgical management of impacted mandibular second molars. *J Clin Orthod* 1998;32: 446-50
21. Camila Palma ,Ana Coelho. Failure of eruption of first and second permanent molars. *J Clin Pediatr Dent* 2003;27(3): 239-246.

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