

A REVIEW OF 39 CASES OF UNERUPTED MAXILLARY INCISORS

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ABSTRACT

Objectives: To study the prevalence, aetiology, gender and site distribution of unerupted maxillary incisors at Lagos University Teaching Hospital, Lagos.

Methods: Clinical records of 2,240 patients that attended the Orthodontic Clinic of the Lagos University Teaching Hospital, Lagos, Nigeria between June 1998 and December 2000 were retrieved and reviewed. Data extracted included age, gender, tooth type(s) and aetiological factors causing delayed eruption were recorded.

Result: Out of 2,240 patients seen during the period of the study, 39 cases (1.7%) presented with a total of 41 unerupted maxillary incisors. Maxillary right central incisor was found to be the most frequently involved tooth 16 (39.0%). The left central incisor involvement was in 13 (31.7%) of maxillary incisors. There was bilateral involvement of the central as well as the lateral incisors in 2 cases representing 4.9% each of the sample studied. Of the lateral incisors, the right one was similarly more often affected (12.2%) than the left one (7.3%). The presence of isolated odontomes was the most common cause of lack of eruption of the maxillary incisors with a prevalence of 20.5%. Other factors causing delayed eruption were odontomes with retained primary tooth (15.4%), presence of supernumerary teeth of especially the mesiodens type (15.4%), retained primary teeth (12.8%), rotation and trauma constituting 7.7% each. An inverted tooth that failed to erupt was recorded in only one case of the population (2.6%). Fibrous tissue delayed eruption of the maxillary incisors in 5.1%, and in about 12.8% the etiological factor could not be ascertained.

Conclusion: All the teeth that have not erupted six months after its normal eruption date should be subjected to radiological examination to ascertain any possible cause. The earlier the removal of the causative factor preventing eruption of the maxillary incisors, the better is the prognosis.

KEYWORDS: *Unerupted, Teeth, Maxillary, and Incisors.*

INTRODUCTION

Delayed eruption of maxillary permanent teeth is a common finding in patients seen in orthodontic practice¹. A considerable number of children are referred for orthodontic consultation as a result of failure of one or two permanent maxillary incisors to erupt. It has been reported that dissatisfaction with the tooth alignment in the incisor region is a common reason for subjective awareness of malocclusion and consequently a demand for orthodontic treatment^{2,3}.

The correction of this anomaly represents a large and significant portion of many orthodontic practices^{4,5}. This necessitates the combined expertise of a number of clinicians. However, the orthodontist has the primary responsibility of coordinating these efforts to provide the patient with the optimal treatment option and with the most stable and favourable outcome⁶.

Studies on the prevalence of delayed eruption of permanent maxillary teeth are very sparse though much has been done on permanent maxillary canines reporting a range of 1.5 – 2.56% in

the Western world⁷⁻⁹. In Nigeria however, 2.1% of patients presented with failure of eruption of permanent maxillary canines⁵.

Numerous aetiological factors are believed to be associated with delayed eruption of the permanent maxillary teeth. The most common cause for delayed eruption of maxillary incisors is the presence of erupted or unerupted supernumerary tooth¹⁰⁻¹⁵. This is because the highest site prevalence of supernumerary teeth occurs in the premaxillary region and the majority is simple conical mesiodens¹⁴. The term mesiodens is used to refer to an unerupted supernumerary tooth in the central region of the premaxilla between the two central incisors¹¹. Mesiodens usually present as single, in pairs or multiple supernumerary teeth¹³.

One of the complications associated with mesiodens is lack of eruption of permanent teeth amongst others, and early detection of mesiodens is most important if such complications are to be avoided^{11, 13,14}.

Other aetiologies reported are odontomes, dilacerations, trauma to preceding deciduous tooth, tooth germ malposition, crowding, calcifying odontogenic cyst, retarded resorption of the deciduous predecessor, premature extraction of deciduous predecessor, dentigerous cyst and other conditions due to malformation of the jaws^{7,12}.

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The presence of odontomes causes delayed eruption of the maxillary teeth.¹⁶⁻¹⁸ Odontomes are more frequently found in the maxilla with an equal sex distribution¹⁶. Common sequel to its development is the displacement or rarely malformation of the adjacent tooth with root malformation found more common than crown malformation¹⁰.

This has been attributed to inadequate space for continued normal root formation due to the impaction¹⁰.

The purpose of this article was to investigate the prevalence of delayed eruption of maxillary incisors, tooth/teeth types(s) involved and to identify the major aetiological factors associated with delayed eruption of permanent maxillary incisors in patients seen at Lagos University Hospital, Lagos, Nigeria.

SAMPLES AND METHODS

This is a retrospective study in which case notes and records of patients seen at the an Orthodontic Clinic of the Lagos University Teaching Hospital between June 1998 and December 2000 were reviewed and classified according to etiological factors causing delayed, or non-eruption of the permanent maxillary incisors.

The subject samples comprised of a group of 39 patients out of a total of 2240 patients whose clinical and radiographic records were studied. There were a total of 41 maxillary incisors involved. For each subject, conventional initial diagnostic radiographs and orthodontic records were available. Additional information recorded were sex, age, tooth/teeth involved in the maxillary arch. Aetiological factor for each case was similarly recorded.

Inclusion criteria included those incisors with a delayed eruption time based on clinical and radiographic assessment of all available records by the first researcher. Excluded from the study were those whose diagnostic radiographs were of poor quality, thus making assessment very difficult.

The data obtained was tabulated and analyzed by computer using the statistical software package, EPI info version 6.0. Chi Square and p- values were obtained for some variables. A p-value of < 0.05 was taken as significant.

RESULTS

The result showed that of 2240 patients seen during the period of study, 39 patients presented with unerupted maxillary incisors with a total of 41 unerupted maxillary incisors. There were 22 females (56.4%), and 17 males (43.6%). The mean age of the patients in the study was 16.0 years + 5.6 (range from 6 to 28 years). The highest prevalence of delayed eruption occurred in the 11 -15 years age group (38.5%). (Table 1). The total prevalence of delayed eruption of maxillary incisors in this study was 1.7%.

The maxillary central incisors were the teeth most frequently delayed in eruption. 75.6% of the teeth with delayed eruption were central incisors; and 24.4% were lateral incisors. The most frequently delayed incisor was the right maxillary incisor 16 (39.0%). Similarly the right lateral incisor was more frequently delayed 5 (12.2%) than the left lateral incisor 3 (7.3%). (Table 2). There were 2 cases with bilateral unerupted teeth. Both central incisors were unerupted (4.9%) in one of the cases and in the other case both lateral incisors (4.9%) were unerupted.

Table 1: Age / Sex distribution of 39 patients with delayed eruption of the maxillary incisors.

Age group (years)	Male	Female	Total	%
0-5	-	-	-	-
6-10	2	4	6	15.4
11-15	8	7	15	38.5
16-20	3	6	9	23.1
21-25	2	5	7	17.9
26-30	2	-	2	5.1
TOTAL	17(43.6%)	22(56.42%)	39	100.0

($X^2 = 11.355, p = 0.787$)

(No significant relationship exists between age and sex in the sample)

Table 2: Teeth involvement of a total of 41 maxillary incisors with delayed eruption

Teeth involved	Total	%
Max. Left Central Incisor	13	31.7
Max. Right Central Incisor	16	39.0
Max. Rt. & Lt. Central Incisors	2	4.9
Max. Left Lateral Incisor	3	7.3
Max. Right Lateral Incisor	5	12.2
Max. Rt. & Lt. Lateral Incisors	2	4.9
TOTAL	41	100.0

Table 3: Aetiology of delayed eruption of maxillary teeth. (39 patients)

Aetiology	No. of teeth	%	Male	Female
Fibrous Tissue	2	5.1	1	1
Inversion	1	2.6	-	1
Supernumerary (Mesiodens)	6	15.4	-	6
Odontomes(isolated)	8	20.5	3	5
Odontomes+ Retained	6	15.4	4	2
Primary teeth				
Retained primary teeth	5	12.8	2	3
Rotation	3	7.7	1	2
Trauma	3	7.7	3	-
Unknown	5	12.8	3	2
TOTAL	39	100.0	17	22

($X^2 = 11.447, p = 0.178$)

(No significant relationship exists between sex and aetiology in the sample)

Odontomes, and odontomes associated with retained primary teeth constituted the major aetiological factor in delayed eruption and were found in 14 (35.9%) of the study group. Other factors identified were the presence of supernumerary teeth (mesiodens) 6 (15.4%), retained primary teeth 5 (12.8%), rotation 3 (7.7%), trauma 3 (7.7%), presence of fibrous tissue 2 (5.1%) and inverted tooth 1 (2.6%). The aetiological factor in 5 (12.8%) cases could not be ascertained. (Table 3).

DISCUSSION

The prevalence of delayed eruption of the permanent maxillary incisors in this study is 1.7%. This value is within the range of 1.5-2.6% reported in previous studies in the literature^{5,7-9}. In this study, females (56.4%) were observed to be more frequently affected than males (43.6%). The increased ratio of the female to male patients is well recognized by most orthodontics and may reflect a difference in perception of malocclusion between the sexes¹⁹. It may also be due to the fact that more females than males rate dental appearance to be more important²⁰. However, it should be noted that females generally tend to seek for aesthetic improvement more than the males. Similarly females constituted more than half of the patients attending Orthodontic Clinic⁵.

This study showed that the central incisors were more often delayed in eruption than the lateral incisors 31 (75.6%) and 10 (24.4%) respectively. Right-sided delayed eruption was more common with both the central and lateral incisors. Bilateral involvement of the tooth types was very rare in this study, with a low prevalence of 4.9% for each tooth type (central and lateral incisors). These findings may be attributed to the location of the odontomes^{17,18}, and supernumerary teeth especially of the conical type, which are mostly found in the midline, occurring more often in the premaxillary region. It was reported that the most common supernumerary tooth appears in the maxillary midline region and is often a cause of an impacted central incisor¹⁵. This was confirmed in this study. Odontomes are more common similarly in the anterior region of the jaws and radiologically contains numerous small radio-opaque denticles²¹, which may be large enough to prevent the eruption of the maxillary tooth/teeth.

The commonest cause of delayed eruption of the permanent maxillary incisors in the present study was the presence of odontomes (35.9%), with and/or without retained deciduous teeth. Odontomes are more frequently found in the maxilla with an equal sex distribution,¹⁶ though in this study females are more affected than the males (1.3:1 ratio). The aetiology of odontomes is unknown but it is thought to be caused by trauma, infection, inheritance and/or genetic mutation¹⁷. These lesions are usually found in the second decade of life and are more common in male patients¹⁷. The most common sequel to the development of an odontome is the impaction of adjacent teeth, which would lead to a delay in its eruption.¹⁷ (Fig. 1 and Fig. 2). Morning reported that root malformation is more common than crown malformation.¹⁷ He attributed this to inadequate space for continued normal root formation as a result of impaction.

A supernumerary (mesiodens) tooth was the cause of delayed eruption in 15.4% of the study population examined. It is of interest to note that supernumerary tooth was the cause of

delayed eruption of only the central incisors in this study (Fig. 3). This was similarly reported by Garvey et al¹⁴ where they concluded that the presence of a supernumerary tooth is the most common cause for the failure of eruption of a maxillary central incisor. This anomaly is mostly found in the midline in the anterior region of the jaws¹⁵. It may cause the retention of the primary incisor also, hence the association of the presence of odontomes and retained primary teeth found in this study.

Figure 1: The photograph of an 18-year-old girl showing delayed eruption of the permanent maxillary right central incisor which was due to the presence of odontomes. Notice the bulge.

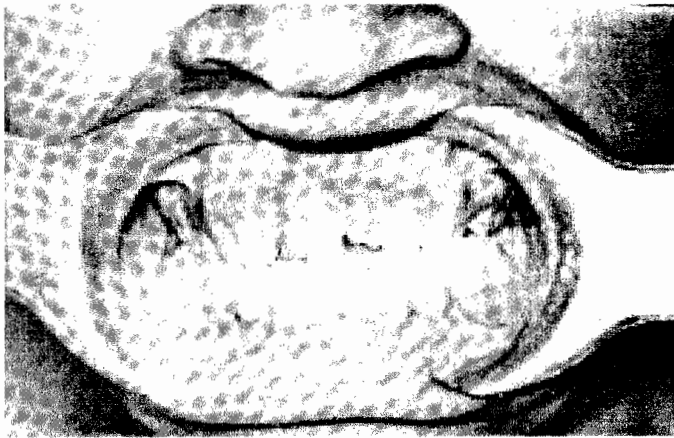


Figure 2: A 12-year-old girl with delayed eruption of the permanent maxillary central incisor. Notice the associated delayed eruption of the maxillary canine. Both were due to the presence of odontomes.



Conical supernumerary are known to cause rotation or displacement of the permanent teeth but rarely delay eruption²². In its development root formation is ahead of or at an equivalent stage to that of permanent incisors and usually present as a mesiodens¹⁵. However in this study mesiodens erupted in one case and thus prevented the eruption of the left maxillary central incisor. The reason for this event may be that the chronological development of the mesiodens is between the formation of the primary and permanent dentition, so that it may erupt before the permanent tooth in some cases.

Figure 3: An erupted mesiodens in a 14-year-old girl which has caused delayed eruption of the permanent maxillary left central incisor.



Retained primary teeth (12.8%), rotated teeth (7.7%), trauma (7.7%) presence of fibrous tissue around the developing teeth (5.1%), and inversion of the tooth (2.6%) are the other aetiological factors found in this study. Dental trauma affects the further development of the successors to injured teeth²³. In our environment, trauma to the anterior teeth is very prevalent with the most common site being the maxillary arch²⁴. Delayed eruption, malalignment of the incisors as well as tooth transposition, was reported as consequences to trauma²⁵.

Inversion of normal teeth is uncommon and relatively few cases are documented. When they occur in the maxilla, they may become impacted, erupt into the nasal cavity or possibly the maxillary antrum but have been known to successfully erupt in the mandible²⁶. In this study, there was only one case of inversion reported and which involved the maxillary right lateral incisor.

CONCLUSION

The skill to diagnose the clinical condition of delayed eruption of any permanent tooth is essential to general practice dentists, paediatric dentists, orthodontists and oral and maxillofacial surgeons. Unusual delay of eruption of permanent teeth should therefore be viewed with great suspicion and should be thoroughly investigated. Clinical and radiographic investigations are vital to making a diagnosis. Once the condition is diagnosed, the collaborative effort of a number of clinicians is the best approach to the management.

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