Research Paper Medical Science

Study of age of eruption of Mandibular replacement teeth

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ABSTRACT

Determination of age by dentition, is an age old method of assessing the age. Eruption of Mandibular permanent incisors, premolar's & canine teeth is preferred because of most of the literature available in this context mention that the permanent replacement teeth are most erratic, bizarre. Mandibular teeth erupt in the following order: (1) first molar (2) central incisor, (3) lateral incisor, (4) canine, (5) first premolar, (6) second premolar, (7) second molar, and (8) third molar1. In the present study school going 335 children's of first to 6th standard (in the city of Vijayapur) were examined to assess the age of eruption of Mandibular permanent replacement teeth. After eruption of Mandibular permanent first molar teeth, children's were examined for eruption of medial & lateral incisor, premolar's & Canine by General physical examination. The age range of examined were from completed 6 years to 12 ½ years irrespective of sex of the child. Mandibular (lower jaw) incisor's, premolar's & canine teeth were examined in the children, between age range of completed 6 years to 12 years.

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KEYWORDS

Introduction;

Age estimation by eruption of teeth is well accepted simple, non invasive method, when compared to assessment of age by ossification centre's. Primary (baby) teeth start to form between the sixth and eighth week of prenatal development, and permanent teeth begin to form in the twentieth week[1]. If teeth do not start to develop at or near these times, they will not develop at all, resulting in hypodontia or anodontia. Among various permanent teeth eruptions, eruption of replacement teeth are reported to be most irregular. However assessment of age between 6 years to 12 years is essentially based on eruption of replacement permanent teeth, in the place of temporary one, because the skeletal changes in the form of ossification centers are of limited number, less value and are of invasive in nature to use. Because of bad oral hygiene & mixed dentition between 6 to 12 years of age, often it is difficult for the medical practitioner to differentiate temporary & permanent teeth. There are very few Indian studies available for reference to decide the age, that too in south Indian population. There are regional differences in the food habits, disease affecting & in particular mineral deficiency or over dose. Hence this study is under taken to develop local reference criteria & add to

existing literature for Indian population to assess the age between 6 to 12 years.

Materials & Methods

Institutional ethical committee approval for the research was obtained by BLDE University's Sri B M Patil Medical College Vijayapur & study was conducted from January 2014 to December 2014. Permission from Block education officer was obtained to conduct research in the schools of Vijayapur city. Primary school children's from near by Govt and private schools were selected from first to 7 standard having age range of above 6 years to 12 years. Loco-parentis consent was obtained from Head master of the school & class teacher concerned, before the selected children's were examined. General physical examination for height & weight was done to include or exclude the child from the study. Further the children's were examined for eruption of Mandibular first permanent molar, incisor's, premolar's & canine teeth for replacement temporary teeth by permanent one or eruption of permanent teeth in presence of its temporary predecessor.

Thus the observations were recorded in master register by their age in year / months in chronology. Results obtained were totaled, percentage calculation was done in the tabular form.

Age wise eruption of permanent first molar teeth, with replacement of respective temporary teeth by their respective permanent one . (Refer table No 1)

Table No 1

No of subject	Age Year month	First Permanent Molar	Incisor 1 2	PM 1 2	Canine	II PM
26	6 - 6.6	18 8 69.23 30.77	8 2 44.44 25.00	-	-	-
23	6.7 - 7	14 9 E S 60.86 39.14	9 6 64.28 66.66	-	-	-
22	7 - 7.6	18 4 81.81 18.18	14 6 77.77 42.85	-	-	-
36	7.7 - 8	34 2S 94.44 5.66	33 22 97.05 66.66	2 1 9.09 50	-	-
43	8 - 8.6	43 100%	42 26 97.67 61.90	7 2 26.92 28.57	-	-
28	8.7 - 9	28 100%	28 25 100 89.28	8 3 32 37.5	-	-
25	9 - 9.6	25 100%	24 21 96 87.5	11 3 52.38 27.27	-	-
35	9.7 - 10	35 100%	34 34 97.14 100	19 19 55.88 100	-	-
32	10 - 10.6	32 100 %	32 32 100 100	27 22 84.37 81.48	15 46.87 68.18	-
13	10.7 - 11	13 100 %	13 13 100 100	12 8 92.30 66.66	3 23.07 37.5	-
22	11 - 11.6	22 100%	22 22 100 100	22 14 100 63.63	9 64.28	5 55.55
18	11.7 - 12	18 100 %	18 18 100 100	17 16 94.44 94.11	12 75	10 83.33
12	12 - 12.6	12 100%	12 12 100 100	12 12 100 100	12 100	9 75
335	5 Y to 14 years	6-8	7-8 8-9	8-11 9 ½ -12	10-12	

Between the age range of completed 6 years to 6 years 6 months 26 children's were examined among which in 18 (69.23 %) children Permanent first molar teeth was found erupted who are below 6 ½ years of age. However in remaining 8 children there was sufficient space behind temporary second molar teeth for the eruption of permanent first molar teeth. Among the 18 children where in permanent first molar teeth was erupted in 8 children's temporary Medial incisor was replaced by its succeeding permanent one. Among these 8 (30.77%)cases where in temporary medial incisor was replaced by its succeeding permanent one, in two children's temporary lateral incisor was replaced by its succeeding permanent lateral incisor.

In the age range of 6 year 7 months to 7 years 23 children's were examined, among which in 14 (60.86 %) children's Permanent first molar was found erupted. While in remaining 9 (39.14%) children's there was sufficient space behind temporary second molar teeth for eruption of Permanent first molar teeth. Among these 14 children's in whom permanent first molar teeth erupted, 9 (64.28 %) children's medial incisor was found erupted, further among these 9 children's in 6 of them found that the lateral incisor was erupted.

Between age range of 7 years to 7 year 6 months 22 children's were examined, among these 18 (81.81 %) children's permanent first molar teeth was found erupted. In remaining 4 (18.18 %) children's there was sufficient behind temporary second molar teeth, for the eruption of permanent first molar teeth. Among 18 children's in whom the permanent first molar teeth was erupted, in 14 (77.77 %) children's medial incisor was found erupted. Further among these 14 children's in 6 (42.85%) children's lateral incisor was found erupted, by the age of Seven years to 7 & half years.

Between the age group of seven & half years to Eight years 36 children's were examined, among this number permanent first molar teeth was erupted in 34 (94.44 %) children's. while in remaining two children's there was sufficient space behind temporary second molar teeth, for eruption of permanent first molar teeth. Out of 34 children's where in permanent first molar teeth was found erupted, medial incisor was erupted in 33 (97.05%) children's. Among these 33 children's lateral incisor was found erupted in 22(66.66 %) children's. out of 22 cases where in lateral incisor was erupted, permanent first pre-molar teeth & out of these two children's, in one case permanent second pre-molar teeth was erupted.

In the age group of completed 8 years to 8 year 6 months 43 children's were examined among whom all children's permanent first molar teeth was found erupted (100%). Medial incisor was erupted in 42 (97.67 %) cases, among these 42 children's in whom medial incisor was erupted, lateral incisor was found erupted 26 (61.90%)children's. out of 26 children's where in lateral incisor was erupted first premolar was found erupted in 7 (26.92%) children's. further among 7 children where first premolar was erupted second premolar teeth was found erupted in 2 (28.57%) children's. *Mandibular permanent first molar teeth erupts by the age of 8 years.*

Between 8 years 6 months to 9 years total 28 children's were examined, among whom mandibular permanent first molar teeth & medial incisor were found erupted in all (100%) the children. While lateral incisor was erupted in 25 (89.28%) children's out of 28 children's examined. *Indicating incisor teeth eruption age is between 8-9 years*. Among the 25 children's in whom the lateral incisor was erupted first premolar teeth was erupted in 8 (32 %) children's, further in 3 children second premolar was found erupted (37.5 %) among these 8 children's.

25 children's were examined between the age of 9 years to 9 year 6 months. In which medial incisor was erupted in 24 (96%) children's & lateral incisor was erupted in 21(87.5 %) children's out of total 24, in whom medial incisor was already erupted. Permanent first pre-molar was erupted in 11(52.38%) children's out of 21 children in whom lateral incisor was erupted. Further permanent second pre molar teeth was erupted in three(27.27 %) children's out of 11 children in whom first permanent premolar was erupted.

In the age group of 9 year 7 months to 10 years total 35 children's were examined, medial & lateral incisors were erupted in almost all cases, while first and second premolars were erupted in 19 children's (55.88 %). Out of 19 children's in whom first permanent premolar was erupted, second premolar was found erupted in all children's. *Indicating Mandibular permanent first premolar teeth erupting is followed by eruption of second premolar teeth in all the cases examined.*

32 children's were examined between the age of 10 years to 10 year 6 months. Permanent first molar, both incisors were erupted in all the children's. permanent first premolar teeth was erupted in 27 (84.37 %) children's, second permanent premolar teeth was erupted in 22 (81.48 %) children's out of 27 children's in whom first permanent premolar teeth was erupted. While canine teeth was found erupted in 15 (68.18 %)children's.

Permanent first molar, both incisor's were erupted in all the 13 children's examined between 10 year 7 months to 11 years. Out of 13 children's in 12 (92.30%)of them first permanent premolar teeth was found erupted. Second premolar teeth was erupted in 8 (66.66%) children's out of 12 children's in whom first premolar was erupted. Canine teeth was erupted in 3 (37.5%) children's out of 8 children's in whom second permanent pre molar teeth was erupted.

22 children's were examined between 11 years to 11 years 6 months. Permanent first molar, both incisors & first permanent premolar teeth were erupted in all the children's examined. Permanent second premolar teeth was erupted in 14 (63.63 %) children's out of 22 children's in whom first permanent pre molar was erupted. While canine teeth was erupted in 9 children's out of 14 children's in whom second permanent pre molar teeth was erupted. Out of 9 children's in whom canine teeth was erupted, 5 (55.55 %) children's show eruption of second permanent molar teeth.

From 11 year 7months to 12 years total 18 children's were examined, both premolars were erupted in almost 95 % cases by this age. While canine teeth was erupted in 12(75%) children's examined. Among 18 children's in 10 (55.55 %) children's second permanent molar teeth was found erupted.

Though study design was less than 12 years of age, looking at erratic eruptions, children's more than 12 years were also included in the study. Among examined children's total 12 children's were between 12 years to 12 year 6 months. Where in canine was found erupted in all the children's examined. While out of 12 children's examined, in 9 (75 %) children's second permanent molar teeth was found erupted.

Discussion;

In the above table no 2 indicate that the permanent first molar teeth erupts between 6-7 years[2,3,4,7,8] while in the present study it erupts between 6-8 years.

In the present study the medial incisor was erupted between 7 years to 8 years, which corresponds to references cited P V Guhraj, Apurba Nandy and Bernard knight. While results of eruption of medial incisor does not match with other studies[4,5,8] .

Lateral incisor teeth was found erupted between the age of 8-9 years, which corresponds to P V Guharaj[2], Apurba Nandy[3] & Parikh[8]. Which mention that the lateral incisor erupts between 8-9 years. While Bernard knight mention 7-8 years, Modi 7.88 years, Krogman 7.70 years, VV Pillay 7 to 9 years.

As per the report of Monthly Microscopy Explorations, Exploration of the Month: January 1998 it is reported that the order of eruption of canine teeth is before eruption of both the premolars. While almost the references cited mention the order of eruption of canine is after the eruption of both the premolar's 2,3,4,5,6,7,8,9 . even in the present study it is found that the order of eruption of mandibular permanent canine teeth starts erupting after eruption of both premolar's.

In the present study the first premolar's was erupted between age of 8-11 years, which does not correspond to references cited [2,3,4,5,6,7,8,9], however the observation in this study is that age range of eruption of mandibular first premolar teeth is one year earlier than all the references cited.

In the present study mandibular permanent second premolar teeth closely followed first eruption pattern of its predecessor first pre molar teeth, but begins to erupt & complete one year later than first one. Eruption pattern of mandibular permanent second premolar teeth is found to be of more wide range than all the references cited which mention age of eruption of mandibular permanent second premolar teeth between 10-12 years[2,3,4,5,6,7,8,9].

Conclusion;

Age of eruption of Mandibular permanent replacement teeth is not uniform across the country.

In this study First Permanent molar erupts between 6-8 years, Medial incisor 7-8 years, lateral ncisor 8-9 years, First premolar 8-11 years, Second premolar 9-12 years and canine 10-12 years.

Eruption of Mandibular permanent premolar teeth is more erratic & have wider age range of eruption.

Table ; 2 Eruption age in years*.

Reference	First molar*	Medial incisor*	Lateral incisor*	1Pre molar*	2 Pre molar*	Canine*
PV Guharaj[2]	6-7	7-8	8-9	9-11	10-12	11-12
A Nandy[3]	6-7	7-8	8-9	9-10	10-11	11-12
VV Pillay[4]	6-7	6-8	7-9	9-11	10-12	11-12
Krogman[5]	6.21 / 5.94	6.54/6.26	7.70/7.34	10.82/10.18	11.47/10.89	10.79/9.86
Modi's[7]	6.48	7.10	7.88	10.50	11.57	10.87
Parikhs [8]	6-7	6-8	8-9	9-11	10-12	11-12
Bernard Knight [9]	6	7/8	7/8	10-11	11	10-11
Present Study	6-8	7-8	8-9	8-11	9 -12	10-12

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