Original Research Paper

Age Determination by Development of Third Molar Teeth with Rongengraphic Skeletal Relationship of Iliac Crest and Ischial Tuberosity in Bikaner City

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Abstract

The aging and identification of victim is either accident, or crime has acquired new substance during the last few years with increasing resource to dental data. Details of eruptions and dentition, of extractions or prosthetic work and of artificial dentures provide precise dental features which can reflect as sound a basis for identifying a dead body as the more traditional finger prints. The history of predevelopment time of radiology indicates that scientist used to estimate age by means of macerating bones, to go for naked eye examination for determination of time of appearance or time of fusion of bony centres, which has a limit for getting a statistical data's and these methods are applicable only dead persons or autopsy specimens This study is attempt to highlight the age determined by development of third molar teeth with skeletal relationship of iliac crest & ischial tuberosity in pelvic region by x-rays in Bikaner city.

Key Words: Eruption, Third Molar, Iliac Crest, Ischial Tuberosity, Nolla's Stage

Introduction:

The history of predevelopment time of radiology indicates that scientist used to estimate age by means of macerating bones, to go for naked eye examination for determination of time of appearance or time of fusion of bony centres, which has a limit for getting a statistical data's and these methods are applicable only dead persons or autopsy specimens. [1]

After the development of radiological methods it became easier to examining the appearance and union of epiphysis of different joints. The aging and identification of victim is either accident, or crime has acquired new substance during the last few years with increasing resource to dental data. Details of eruptions and dentition, of extractions or prosthetic work and of artificial dentures provide precise dental features which can reflect as sound a basis for identifying a dead body as the more traditional finger prints. [2]

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There are three periods in life, each differing in relation to tooth development. The first period is from utero to the time of eruption of the first tooth. The second phase is from age of eruption of the first tooth to about 12 years, the third follows when almost all permanent teeth are already present in the mouth. [2]

Nolla studied on the development of the teeth using x-rays in both sex and he found that dental development starts early in girls as compared to boys. [2]

Schour and Massler [3] stated that the age of calcification in teeth are distinct process and may not correspond to those of chronological age.

Logan and kronfeld [4] observed that the crown of lower third molar completely develops between the ages of 12 to 16 years. But further they observed that the root of this tooth is completed at the age of 18 to 25 years.

Gustafson [5] proposed a unique method of age estimation based on certain regressive changes in the hard tissues of teeth like attrition, secondary dentine, root translucency and cementum apposition.

Miles [6] did a studied on extracted third molar and radiographs of contemporary teeth and concluded that the root of the third molars are nearly completed & apical canals are beginning to close at 18 years. By the 20 years the apical canals are usually closed and seen with naked eye, in 22 years the apical canals are

not only closed but in radiograph they appear more constricted than at an early age.

Delitz [7] studied on Australians population by intra oral periapical radiograph of third molars in different age groups and concluded that completion of crown formation and beginning of root formation of lower third molar occurs before the age of 19 years.

Root formation equal in height to that of the crown usually occurs between the ages of 15-18 years. Complete formation of tooth with convergent root canals at the apex never occurs before the age of 19 years.

This study is an attempt to highlight the age determined by development of third molar teeth with skeletal relationship of iliac crest and ischial tuberosity in pelvic region by X-rays in Bikaner city.

Materials and Methods:

The randomized controlled trial study was conducted in the Department of Forensic Medicine & Toxicology, Radio-diagnosis and Dental Department in P.B.M hospital, Bikaner, Rajasthan. Total 300 cases (135 girls and 165 boys) of both sexes, bearing age group between 13- 24 years were included in this study.

The candidate were chosen from different schools, colleges and outdoor in P.B.M hospital, in Bikaner city. Only those cases were selected whose exact date of birth was verified by the school /college authority subjects residing for more than 10 years in Bikaner city were included in the study.

The subjects for the study were divided into various age groups. The dental examination of the subjects were done with the aid of mirror, probe and counting of teeth were recorded by palmer's notation. The intra-oral periapical radiograph of upper and lower third molar teeth of all subjects were taken and observed regarding various stages by Nolla's stages of development of teeth.

After clinical examination, the observations about fusion of epiphysis iliac crest and ischial tuberosity in pelvic region were recorded and analysed.

Observations and Results:

In this study we observed that at 13-14years to 16-17 years group in boys and girls there was no fusion of epiphysis of Iliac crest and eruption of third molar in mandible and maxilla in radiograph.

Age Group of 17-18 years showed that out of total 26 boys and 19 girls only four girls and nine boys showed the fusion of epiphysis in Iliac Crest and 8 stages of development of third molar in both arches.

In 18-19 years to 23-24 years group almost all boys and girls except 18-19 years group (only 12 girls & 14 boys) complete fusion of epiphysis in iliac crest and eruption of third molar was seen. (Table 1)

Present study showed that in boys and girls of 13-14years to 17-18 years age group there were no fusion of epiphysis of Ischial Tuberosity. But eruption of third molar was seen in only 17-18 years group in mandible and maxilla in radiograph.

In 18-19 years age group out of total boys (18) and girls (15) only three girls and four boys showed the fusion of epiphysis in Ischial Tuberosity and 8stages of development of third molar in both arches.

In 19-20 years to 23-24 years group almost all boys and girls except (only 9 girls & 11 boys of 19-20 years group) showed complete fusion of epiphysis in Ischial Tuberosity and eruption of third molar. (Table 2)

Discussion:

Present study included 300 cases out of which 165 were boys & 135 were girls. Observation of present study indicates the third molar eruptions were seen in age group of 17-18 years. The findings of eruptions of third molar are consistent with observations described in of Modi's textbook [8] but not consistent with observation of Powell [9] who while working as police surgeon of Bombay give the upper limit 14 years for third molar teeth in Indian children.

As soon as second molar teeth erupts the space for the third molar teeth start to form and it was seen well marked at the age 16-17 years in most of cases in present study.

Third molar teeth in mandible have reflected earlier eruption in comparison to maxilla. The tipoff crown of third molar tooth was seen in most of the cases and the finding were consistent with Schranz [10] but not consistent with Koski et al [11] who concluded that molars do not cut the gums until they have almost reached the occlusal level.

Our findings were also similar to Adler study in which he observed that eruption is not bilaterally symmetrical. [12]

These finding were not inconsistent with observations of Schranz. [10] In our study both males and females in group 13-14 years to almost 17-18 years group showed no fusion of epiphyseal in iliac Crest and Ischial Tuberosity in pelvis region.

Majority of cases 19-20 years to 23-24 years showed fusion of epiphysis in iliac Crest and Ischial Tuberosity. The present study findings were close to other studies. [13-16]

Conclusion:

The developmental stage of third molar teeth was not showed significantly difference between girls and boys. Only third molar teeth eruption should not be sufficient criteria of estimation of age. The most important aspect of dental age estimation for the Forensic Odontologist to remember is that he or she should not be restricted to only one age estimation technique but should apply the different techniques available and perform repetitive measurements and calculations in order to establish maximum reproducibility.

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Table 1
Fusion of Iliac Crest & Dental Stages of Development (Nolla's Stages)

Age grps (yrs)	Cases		Fusion of Iliac Crest		Development stages of Third molar			
	Girls	Boys	Girls	Boys	Mandibular		Maxillary	
					Girls	Boys	Girls	Boys
13-14	10	13	-	-	-	-	-	-
14-15	11	13	-	-	-	-	-	-
15-16	9	12	-	-	-	-	-	-
16-17	14	16	-	-	-	-	-	-
17-18	19	26	4	9	8	8	8	8
18-19	15	18	12	14	8	8	8	8
19-20	17	15	17	15	9	9	9	9
20-21	16	19	16	19	9	9	9	9
21-22	11	14	11	14	10	10	10	10
22-23	8	11	8	11	10	10	10	10
23-24	5	8	5	8	10	10	10	10

Table 2
Fusion of Ischial Tuberosity & Dental Stages of Development (Nolla's Stages)

Age group (yrs)	Cases		Fusion of Ischial Tuberosity		Development stages of Third molar			
	Girls	Boys	Girls	Boys	Mandibular		Maxillary	
					Girls	Boys	Girls	Boys
13-14	10	13	-	-	-	-	-	-
14-15	11	13	-	-	-	-	-	-
15-16	9	12	-	-	-	-	-	-
16-17	14	16	-	-	-	-	-	-
17-18	19	26	-	-	8	8	8	8
18-19	15	18	3	4	8	8	8	8
19-20	17	15	9	11	9	9	9	9
20-21	16	19	16	19	9	9	9	9
21-22	11	14	11	14	10	10	10	10
22-23	8	11	8	11	10	-	10	-
23-24	5	8	5	8	10	-	10	-