

Epidemiological Status of 3rd Molars – Their Clinical Implications

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ABSTRACT

The purpose of this study was to describe the presence and impaction status of third molars in a Western U.P. population between age group of 17 and 24 years. A total of 3000 college students were clinically evaluated for the status of their 3rd molars. Out of these, the soft tissue associated with prophylactically extracted asymptomatic 3rd molars was histopathologically assessed. A definite eruption pattern of third molars was observed such that the percentage of teeth that were not erupted was much higher at age 17 years than at age 24 years. A decline in the eruption of teeth along with increased chances of impaction for teeth which were not erupted at 21 years was noted. Hence, it can be hypothesized that a substantial proportion of teeth impacted at 17 years do erupt fully, in the oral cavity with maximal chances of eruption between 17-21 years of age. The assessment of soft tissue changes in asymptotically extracted teeth revealed definite histopathological alterations.

Key Words: Third molars, Prophylactic, Eruption

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Removal of third molars in young adults is one of the most common surgical interventions in the field of dentistry. The prophylactic removal of these teeth is a controversial subject with respect to the incidence of pathologic conditions associated with impacted third molars. The literature shows that tooth impaction is a frequent phenomenon.^(1,2) However, there is considerable variation in the prevalence and distribution of impacted teeth in different regions of the jaw.^(2,3) Factors affecting the prevalence include the selected age-group, timing of dental eruption, and the radiographic criteria for dental development and eruption. Although removal of impacted third molars is the most common oral surgical procedure, many investigators have questioned the necessity of removal for patients who are free of symptoms or associated pathologies. Such comments are based on the view that long-term retention of impacted teeth has little risk of pathological change in the tooth itself, or of adverse effects on adjacent structures.

There is not much information in the literature about the natural history of third molars in young people. The probability and rate of successful eruption from the various impaction states is also unknown. No data on the prevalence of impacted teeth

and associated pathologies is available in the western U.P. population. There is a clear need for data from population-based studies, so that information on the natural history of third molars in young adults can be brought into the ongoing debate on their prophylactic removal.

The aim of the present study is to clinically evaluate the prevalence and eruption status of third molars in young student population of Western U.P between the age group of 17 to 24 years at a given time. The follicular tissues associated with few asymptomatic extractions of third molar teeth were histopathologically assessed for any clinical implications.

Material and Methods

3000 college attending students aged between 17-24 years from the western U.P population were randomly selected as the study sample. The sample consisted of 1583 males and 1417 females. Oral examinations were conducted for each age group using calibrated dental examiners. The presence or absence of third molar teeth along with their eruption status was recorded for each study subject at a particular point of time. All third molars in the oral cavity of the study subjects were categorized as one of the following:

Erupted (E): Fully erupted tooth crown at the level of occlusal plane observed in the oral cavity at the time of examination.

Not Erupted (NE): Tooth was not visible in the oral cavity or only one cusp of the tooth crown was visible.

The follicular tissue associated with 20 asymptomatic extractions of third molar teeth from individuals in the above mentioned study sample were histopathologically assessed. The histopathological findings were confirmed by two independent pathologists and a consensus diagnosis was formulated and recorded.

Results

Presence of third molars at age 17

At age 17, a total of 84 participants were examined, of whom 48[57.1%] had no third molars; 18[21.42%] had only one third molar; 12[14.28%] had two third molars; 6[7.14%] had three third molars; and 0 had all four [Table 1, Graph 1]. The total number of third molars present at 17 years of age in 84 individuals was 60. These comprise 25 upper left, 28 upper right, 4 lower left and 3 lower right third molars [Table 2].

Presence of third molars at age 18

At age 18, a total of 270 participants were examined, of whom

Table 1: Clinical status of third molar between ages 17 to 24 years, by tooth

| Age (years) | 0/4 | 1/4 | 2/4 | 3/4 | 4/4 | No. of individuals (n =3000) |
|-------------|-------------|------------|-------------|-------------|-------------|------------------------------|
| 17 | 48(57.1%) | 18(21.42%) | 12(14.28%) | 6(7.14%) | 0 | 84 |
| 18 | 168(62.2%) | 30(11.85%) | 24(8.88%) | 18(6.66%) | 18(6.66%) | 270 |
| 19 | 180(48.38%) | 30(8.06%) | 48(12.9%) | 36(9.67%) | 90(24.19%) | 372 |
| 20 | 276(37.7%) | 66(9.01%) | 90(12.29%) | 60(8.19%) | 240(32.78) | 732 |
| 21 | 168(23.52%) | 66(9.24%) | 102(14.28%) | 108(15.12%) | 270(37.81%) | 714 |
| 22 | 150(32.46%) | 30(6.49%) | 96(20.77%) | 32(6.92%) | 144(31.16%) | 462 |
| 23 | 30(12.5%) | 30(12.5%) | 24(10%) | 30(12.5%) | 126(52.5%) | 240 |
| 24 | 24(19.04%) | 24(19.04%) | 12(9.52%) | 12(9.52%) | 54(42.85%) | 126 |

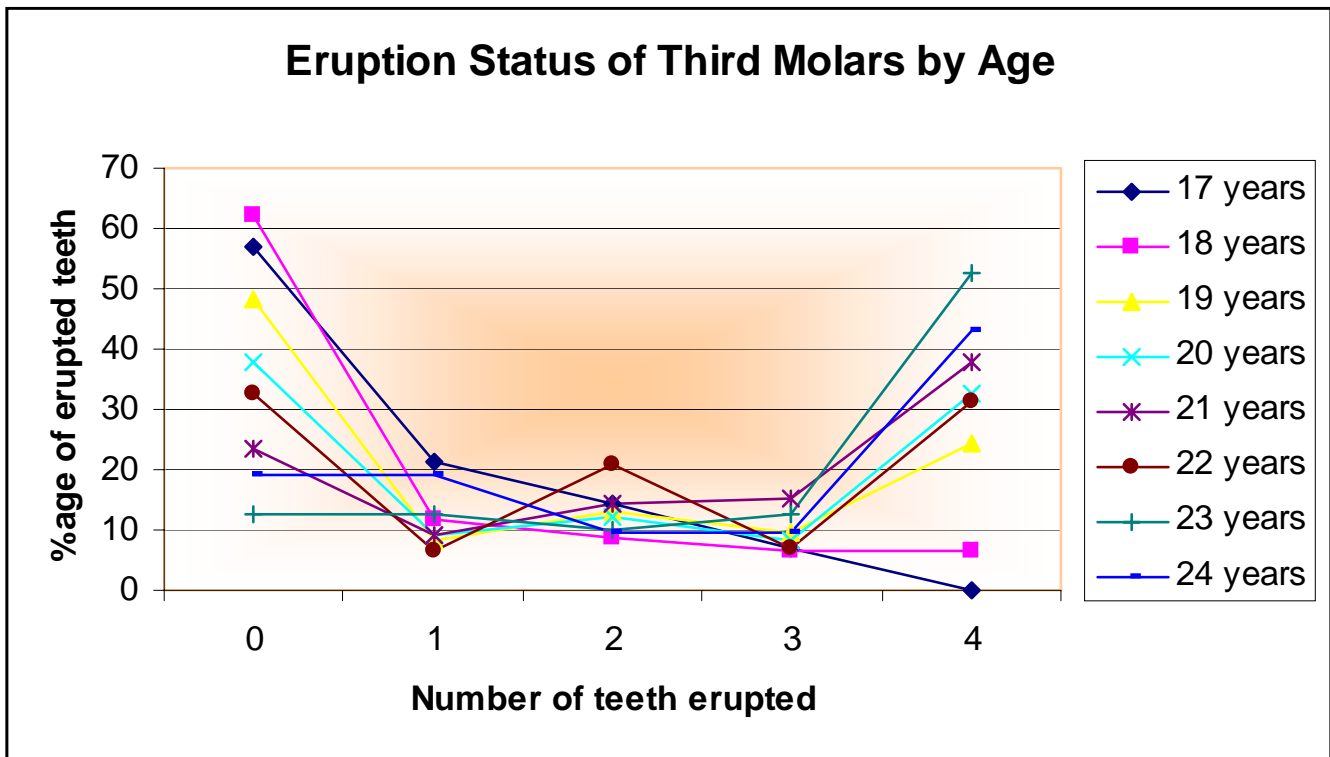


Fig. 1 : Eruption status of third molars between age 17-24 years

168[62.2%] had no third molars; 30[11.85%] had only one third molar; 24[8.88%] had two third molars; 18[6.66%] had three third molars; and 18[6.66%] had all four [Table 1, Graph 1]. The total number of third molars present at 18 years of age in 270 individuals was 252. These comprise 70 upper left, 80 upper right, 50 lower left and 52 lower right third molars [Table 2].

Presence of third molars at age 19

At age 19, a total of 372 participants were examined, of whom 180[48.38%] had no third molars; 30[8.06%] had only one third molar; 48[12.9%] had two third molars; 36[9.67%] had three third molars; and 90[24.19%] had all four [Table 1, Graph 1]. The total number of third molars present at 19 years of age in 372 individuals was 546. These comprise 200 upper left, 150 upper right, 96 lower left and 100 lower right third molars [Table 2].

Presence of third molars at age 20

At age 20, a total of 732 participants were examined, of whom 276[37.7%] had no third molars; 66[9.01%] had only one third molar; 90[12.29%] had two third molars; 60[8.19%] had three third molars; and 240[32.78] had all four [Table 1, Graph 1]. The total number of third molars present at 20 years of age in 732 individuals was 1386. These comprise 390 upper left, 420 upper right, 296 lower left and 280 lower right third molars [Table 2].

Presence of third molars at age 21

At age 21, a total of 714 participants were examined, of whom 168[23.52%] had no third molars; 66[9.24%] had only one third molar; 102[14.28%] had two third molars; 108[15.12%] had three third molars; and 270[37.81%] had all four [Table 1, Graph 1]. The total number of third molars present at 21 years of age in 714 individuals was 1664. These comprise 513 upper left, 474 upper right, 340 lower left and 337 lower right third molars [Table 2].

Presence of third molars at age 22

At age 22, a total of 462 participants were examined, of whom 150[32.46%] had no third molars; 30[6.49%] had only one third molar; 96[20.77%] had two third molars; 32[6.92%] had three third molars; and 144[31.16%] had all four [Table 1, Graph 1].

The total number of third molars present at 22 years of age in 462 individuals was 934. These comprise 284 upper left, 280 upper right, 187 lower left and 183 lower right third molars [Table 2].

Presence of third molars at age 23

At age 23, a total of 240 participants were examined, of whom 30[12.5%] had no third molars; 30[12.5%] had only one third molar; 24[10%] had two third molars; 30[12.5%] had three third molars; and 126[52.5%] had all four [Table 1, Graph 1]. The total number of third molars present at 23 years of age in 240 individuals was 672. These comprise 192 upper left, 203 upper right, 140 lower left and 137 lower right third molars [Table 2].

Presence of third molars at age 24

At age 24, a total of 126 participants were examined, of whom 24[19.04%] had no third molars; 24[19.04%] had only one third molar; 12[9.52%] had two third molars; 12[9.52%] had three third molars; and 54[42.85%] had all four [Table 1, Graph 1]. The total number of third molars present at 24 years of age in 126 individuals was 300. These comprise 88 upper left, 92 upper right, 55 lower left and 65 lower right third molars [Table 2].

Out of 20 follicular tissues obtained from asymptomatic extraction, 7 of them showed definite changes such as proliferation, squamous metaplasia and to a certain extent mucous metaplasia was also observed in the lining of otherwise flat cells.

Discussion

Although there is general agreement by dentist and dental specialists that the presence of disease associated with third molar teeth is an indication for their removal. Prophylactic removal remains controversial. The question of whether to extract asymptomatic third molar is still being debated, even though several cross sectional studies have shown that the number of serious sequelae of retention of these teeth is small.

Estimates of the prevalence of one or more third molars in young adults range from 85% to 92%, but most have not yet erupted by the time a person is 20 years old (4). The reported

Table 2 : Eruption status of 3rd molars between ages 17 to 24 years, by quadrant

| Age (years) | Upper left 3 rd molar | | Upper right 3 rd molar | | Lower left 3 rd molar | | Lower right 3 rd molar | | No. of teeth in individuals (nx4) |
|-------------|----------------------------------|-----|-----------------------------------|-----|----------------------------------|-----|-----------------------------------|-----|-----------------------------------|
| | E | NE | E | NE | E | NE | E | NE | |
| 17 | 25 | 28 | 28 | 25 | 4 | 113 | 3 | 110 | 84x4 =336 |
| 18 | 70 | 176 | 80 | 152 | 50 | 265 | 52 | 235 | 270x4=1080 |
| 19 | 200 | 215 | 150 | 185 | 96 | 280 | 100 | 262 | 372x4=1488 |
| 20 | 390 | 502 | 420 | 428 | 296 | 300 | 280 | 312 | 732x4=2928 |
| 21 | 513 | 252 | 474 | 260 | 340 | 320 | 337 | 350 | 714x4=2856 |
| 22 | 284 | 175 | 280 | 185 | 187 | 273 | 183 | 281 | 462x4=1848 |
| 23 | 192 | 68 | 203 | 60 | 140 | 75 | 137 | 85 | 240x4=960 |
| 24 | 88 | 48 | 92 | 42 | 55 | 62 | 65 | 52 | 126x4=504 |

prevalence of third molars in young adults has been reported to be 3% to 4% for 1 third molar, 8% to 11% for 2 third molars, 9% to 12% for 3 third molars, and 73% to 77% for all 4 third molars (5,6). In the present study, carried out on individuals aged between 17-24 years the prevalence reported was 6%-24% for 1 third molar, 9% to 20% for 2 third molars, 7% to 15% for 3 third molars and 7% to 53% for all 4 molars.

Follicular enlargement of impacted third molars is another major concern in the literature because if such cystic changes develop, the management of the pathological lesion becomes more complicated. The prevalence of increased pericoronal space of more than 4 mm in impacted third molars is approximately 1% (5). For patients older than 50 years, however, this figure was 6.7% (4). Thus, the risk of cystic changes associated with long-term impacted third molars should be considered as an indication for elective removal of asymptomatic impacted teeth. In the present study follicular tissue associated with clinically asymptomatic teeth were studied and approximately 35% of the cases showed definite histopathological alterations such as metaplastic or hyperplastic changes in the epithelium. Considering this high percentage of pathological change regular radiographic follow up of asymptomatic impacted third molars after a particular age is recommended so as to be able to surgically intervene when pathology arises.

To our knowledge, this is the first population-based study to evaluate the fate of upper and lower third molars among young adults in western U.P. As such, it has the potential to make a substantial contribution to the ongoing debate on the prophylactic removal of third molars. Briefly, the findings can be summarized as follows:

- Between the ages of 17-21 years, a steady increase in the number of erupted third molars was observed. The percentage of erupted third molars with respect to total number of third molars at 17 years was 17.85% and at 21 years was 58.26%. A decline in the subsequent eruption of teeth along with progressive increase in chances of impaction for teeth which were not erupted at age 21 years was observed.
- Mandibular teeth were more frequently impacted/Not Erupted when compared to the maxillary teeth.
- No significant difference was observed in the eruption pattern of right and left sides of both mandibular and maxillary third molars.
- Increased thickness in lining of the dental follicle associated with these teeth, and other related features which have been seen in histopathological analysis would probably justify the emphasis on pathology with respect to treatment modality. A common intrinsic potential is present, but the subjectivity of expression is different, depending on individual parameters.

Radiographic examination was not included largely because

of resource constraints as well as questionability of this for radiation exposure to a mass population. A longitudinal study for the same population has been undertaken by our department and as per data obtained, we would recommend evaluation of unerupted teeth at age 21 years.

The present study renders useful data from Western U.P population regarding the clinical status of third molars. This data will come to aid in policymaking regards to diagnosis and treatment considerations for asymptomatic third molars.

Further similar studies would have to be conducted and analyzed to see their parallelism to the present studies findings. Overall 3rd molar eruption status would lead to approving/disapproving the formulated policies as erstwhile laid down by American Dental Association (ADA). The analysis could bring about an answer to any racial or intercontinental variations in the pattern of 3rd molar eruption.

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