Estimating Age of Maxillary and Mandibular Third Molar Eruption of Late Adolescent Age

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**Background** : **Third molars are in many respects the most variable teeth in the dentition. The third molars are the teeth that are most often congenitally missing. If present, they might follow an abortive eruption path and become impacted. The 3rd molar is the one marker in this tooth indicating that an individual is quite likely to be at least 18 years of age. The aim of this study is to find the relationship between third molar eruption and age on 1st term Andalas University students , and to predict the risk of 3rd molar eruption problem in late adolescent age**

**Materials and methods** **:** **The cross sectional study included sample of 300 male (16-21 years old) and 300 female (17-19 years old) students subject in the range age , for each subject clinical visual oral examination was taken**

**Results : The mean age of having clinically completely erupted maxillary third molars was 21.02 years in male subjects and 21.48 years in female subjects. Mean age of having clinically completely erupted mandibular third molars was 20.23 years in male subjects and 21.03 years in female subjects .**

**Conclusions : This approach requires individuals in that age to have regular dental reviews or ’checkups’, so that the status of the wisdom teeth can be monitored to prevent further pathologic conditions later in life**

# Keywords : third molar, eruption , late adolescent

**Introduction**

Third molars (3M) are located at the very back of the mouth on both the upper and lower jaws, and four molars usually appear in the mouth between the ages of 18-24 years..1Upper and lower 3M teeth are the last teeth to erupt, regardless race and gender, and normally do not erupt at occlusal plane until mandibular growth is complete.2 Wisdom teeth often grow through the gums (erupt) without problems; however, sometimes, the wisdom tooth is unable to erupt properly and becomes “impacted”.1 Third molar crown formation begins around 9 to 10 years of age and may be seen in panoramic radiograph, in about 90% of the cases, at 11 years of age. Its eruption period is very variable, initiating at 16 years of age. However, it more frequently erupts between 18 and 20 years of age 2.

Impaction of mandibular 3rd molar is a common problem in adult and it causes pain, pericoronitis and some times more serious problems like cellulitis, submandibular space infections in delayed condition, sometimes 3rd molar need to be extracted in initial stage after confirming the type and eruption pattern of particular teeth by radiograph to avoid delayed problem associated with impaction like post operative pain and infection3.

The preventive treatment (non-surgical, surgical) removal of third molars (M3s) should be based on evidence. To optimize the timing of treatment of M3s, it is essential to predict the eruption of the tooth and, even more importantly, to recognize beforehand which teeth will become involved in pathologic conditions later in life.4

**Method**

The cross sectional study was conducted in Medika Andalas Clinic on May – July 2017 . Subjects consist of 300 male and 300 female students . Inclusion criteria were: subjects in the age group of 16 - 20 years . Exclusion criteria were: previous history of surgical removal of third, second, or first molar; previous history of surgery in the posterior jaws; previous history of any pathology of development anomalies like cleft palate and syndromes; previous history of orthodontic treatment ; congenitally missing third molars were not included 5. The subjects were examined on dental unit under adequate illumination using sterilized mouth mirrors and probes for the eruption of third molar.

**Result**

The study sample consisted of 600 subjects, of which 300 (50%) were males and 300 (50%) were females, aged between 16 – 21 years. The total number of third molars in the study was 253, clinically erupted in both maxilla and mandible

**Table 1. Comparison of status of maxilla and mandible third molars in both sexes**

|  |  |  |  |
| --- | --- | --- | --- |
| **Teeth**  | **Sex** | **Mean ±SD** | **p Value** |
| **Maxillary M3** | Male | 21.02±0.25 | 0.023 |
| Female | 21.48±0.15 |
| **Mandibular M3** | Male | 20.23±0.72 | 0.019 |
| Female | 21.03±0.37 |

Table 1 shows that the mean age of having clinically completely erupted maxillary third molars was 21.02 years in male subjects and 21.48 years in female subjects. Mean age of having clinically completely erupted mandibular third molars was 20.23 years in male subjects and 21.03 years in female subjects .Statistically significant difference (P < 0.05) was obtained in maxillary and mandibular third molars on male and female subject. This difference indicates that maxillary eruption sequence is earlier in males than in females .

**Discussion**

The result of this study shows agreement with Priyadarshini study in South India in 2015. The mean age of having clinically completely erupted maxillary third molars was 22.41 years in male subjects and 23.81 years in female subjects and that of mandibular third molars was 21.49 years in male subjects and 23.34 years in female subjects. Mandibular third molars were clinically missing more often in females than in males. Eruption of mandibular third molars was generally ahead of the emergence of maxillary third molars into the oral cavity. Third molar development between male and female subjects showed statistically significant differences at calcification stage F and stage G in maxillary third molars and stage F in mandibular third molars (P < 0.05).

Third molars in humans are by far the most variable teeth with respect to size, shape, and formation. Third molars are also the only teeth to complete their formation after the onset of puberty and they exhibit an unusually long developmental course lasting more than 10 years.5 Third molar sometimes erupt completely , however sometimes it cannot erupt properly and become impacted. A lack of space in the arches is a common cause of impaction of the third molars. When remodeling/resorption in the anterior region of the mandibular ramus is limited, M3s become impacted.6

The impacted mandibular third molar tooth is common among adults. It has been estimated that 1 out of every 11 mandibular third molar teeth, aged 15 to 35 years was impacted. 3 Impacted wisdom teeth have been associated with pathological changes such as pericoronitis, root resorption, periodontal disease, caries and development of cysts or tumours.7

Most discomfort of erupting wisdom teeth is equivalent to teething and disappears on full eruption. Most infection of the gum tissue around the erupting or partially erupted teeth can be prevented by good oral hygiene, including tooth brushing. Infection occurs in fewer than 10% of third molars, most of which can be cured with antibiotics, oral rinsing, or removal of excess tissue (the hyperculum) around the tooth, without requiring removal of the tooth itself.8

When the discomfort indicates the surgery treatment , tooth removal should be done. In 2000, the first National Institute of Clinical Excellence (NICE) guidelines related to third molar (M3) surgery, a commonly performed operation in the United Kingdom, were published.9 Third molar extraction is one of the most frequent procedures in oral surgery. The reason for these extractions is the high incidence of impaction, often associated with a number of oral problems, such as pericoronitis, periodontal defects in the distal region of the second molar, caries in the third or second molars, different types of odontogenic cysts and tumors, and crowding of the lower incisors.10

It’s been said that one becomes older, third molars (M3s) become more difficult to remove, may take longer to remove, and may result in an increased risk for complications associated with removal. The age of 25 years appears in many studies to be a critical time after which complications increase more rapidly. It also appears that recovery from complications is more prolonged and is less predictable and less complete with increasing age. As such, many clinicians recommend removal of M3s in patients as young adults. Advocates of M3 retention need to review carefully with their patients the risks of delaying M3 removal with the same degree of emphasis as the risks associated with operative treatment.11 Venta’s study concluded that one fourth of retained and disease-free M3s need to be removed preventively at a young age, whereas the rest should be treated according to signs and symptoms.4

Wisdom teeth do not always fulfil a functional role in the mouth. When surgical removal is carried out in older patients the risk of more postoperative complications, pain and discomfort increases. Nevertheless, in most developed countries the prophylactic removal of trouble-free wisdom teeth, either impacted or fully erupted, has long been considered as 'appropriate care'. Prudent decision-making, with adherence to specified indicators for removal, may reduce the number of surgical procedures by 60% or more. It has been suggested that watchful monitoring of asymptomatic wisdom teeth may be an appropriate strategy.12

The findings also suggest that there is only a cost saving or health gain in removing asymptomatic, pathology-free mandibular third molars .6 Should the chance of a patient developing one of pericoronitis, periodontitis, and caries these three diseases be greater than the threshold value identified in this study then removal becomes the more cost-effective strategy. Retention of impacted wisdom teeth is defined as monitoring the status of wisdom teeth. To avoid adverse effects and the cost of removal of wisdom teeth, some advocate retention of asymptomatic disease-free impacted wisdom teeth (e.g. NICE 2000). This approach requires individuals to have regular dental reviews or ’checkups’, so that the status of the wisdom teeth can be monitored.7

**Conclusion**

The mean age of having clinically completely erupted maxillary third molars was 21.02 years in male subjects and 21.48 years in female subjects. Mean age of having clinically completely erupted mandibular third molars was 20.23 years in male subjects and 21.03 years in female subjects . This approach requires individuals in that age to have regular dental reviews or ’checkups’, so that the status of the wisdom teeth can be monitored to prevent further pathologic conditions later in life .

**Refference**

1. Nhs Center For Reviews And Dissemination. Prophylactic removal of impacted third molars: is it justified? *Br J Orthod*. 1998;26(2):149-151. doi:10.1093/ortho/26.2.149.

2. Vilela EM, Amorim Vitoi P. Study of position and eruption of lower third molars in adolescents. 2011;88(44):390-397.

3. Biswas G, Gupta P, Das D. Wisdom teeth - A major problem in young generation, study on the basis of types and associated complications. *J Coll Med Sci*. 2010;6(3):24-28. doi:10.3126/jcmsn.v6i3.4071.

4. Ventä I. How Often Do Asymptomatic, Disease-Free Third Molars Need to Be Removed? *J Oral Maxillofac Surg*. 2012;70(9):S41-S47. doi:10.1016/j.joms.2012.04.037.

5. Priyadharshini KI, Idiculla JJ, Sivapathasundaram B, Mohanbabu V, Augustine D, Patil S. Age estimation using development of third molars in South Indian population: A radiological study. *J Int Soc Prev Community Dent*. 2015;5(Suppl 1):S32-8. doi:10.4103/2231-0762.156522.

6. Edwards MJ, Brickley MR, Goodey RD, Shepherd JP. The cost, effectiveness and cost effectiveness of removal and retention of asymptomatic, disease free third molars. *Br Dent J*. 1999;187(7):380-384. doi:10.1038/sj.bdj.4800285a.

7. Ghaeminia H, Perry J, Mel N, et al. 27578151. 2016;(8). doi:10.1002/14651858.CD003879.pub4.www.cochranelibrary.com.

8. Friedman JW. The Prophylactic Extraction of Third Molars: A Public Health Hazard. *Am J Public Heal J Public Heal*. 2007;97(97):1554-1559. doi:10.2105/AJPH.

9. Renton T, Al-Haboubi M, Pau A, Shepherd J, Gallagher JE. What Has Been the United Kingdom’s Experience With Retention of Third Molars? *J Oral Maxillofac Surg*. 2012;70(9):S48-S57. doi:10.1016/j.joms.2012.04.040.

10. Costa MG Da, Pazzini CA, Pantuzo MCG, Jorge MLR, Marques LS. Is there justification for prophylactic extraction of third molars? A systematic review. *Braz Oral Res*. 2013;27(2):183-188. doi:10.1590/S1806-83242013000100024.

11. Pogrel MA. What Is the Effect of Timing of Removal on the Incidence and Severity of Complications? *J Oral Maxillofac Surg*. 2012;70(9):S37-S40. doi:10.1016/j.joms.2012.04.028.

12. Mettes DT, Nienhuijs MM, van der Sanden WJ, Verdonschot EH, Plasschaert A. Interventions for treating asymptomatic impacted wisdom teeth in adolescents and adults. In: Mettes DT, ed. *Cochrane Database of Systematic Reviews*. Chichester, UK: John Wiley & Sons, Ltd; 2005. doi:10.1002/14651858.CD003879.pub2.