10.5005/jp-journals-10050-10100

ORIGINAL ARTICLE

Prevalence of Impacted Mandibular Third Molars in an East Indian Subpopulation: A Retrospective Radiographic Study

[1]Sumit Mohan, [2]Virender K Prajapati, [3]Ajoy Shahi

ABSTRACT

The purpose of this retrospective radiographic study was to evaluate the position of mandibular third molars. This study was conducted at the Dental Institute, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand. Patients who had reported with the complaint of pain and swelling in the lower third molar area were assessed and advised orthopantomograph (OPG) for their lower third molar. These were evaluated according to Pell and Gregory classification. Of the total 600 patients examined, 300 were males and 300 were females. Most of the patients were between 30 and 39 years of age (n = 250). It was observed that position I (n = 313) and class II (55% n = 324) were found to be the most common.

Keywords: Angulation, Pell and Gregory classification, Third molar impaction.

How to cite this article: Mohan S, Prajapati VK, Shahi A. Prevalence of Impacted Mandibular Third Molars in an East Indian Subpopulation: A Retrospective Radiographic Study. Int J Adv Integ Med Sci 2017;2(4):175-177.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

An impacted tooth is a tooth that fails to erupt in its proper functional position in the dental arch.[1] Third molars are the most frequently impacted teeth. They are a dilemma to the dentist as they are associated with cysts and tumors.[2] Sometimes impacted teeth may be considered as an etiologic factor in case of fracture mandible, vague orofacial pain and neuralgias, temporomandibular joint disorders, and crowding of the lower arch.[3,4]

[1]Lecturer, [2]Professor and Head, [3]Reader

[1]Department of Conservative, Endodontics and Aesthetic Dentistry Dental Institute, Rajendra Institute of Medical Sciences Ranchi, Jharkhand, India

[2,3]Department of Oral & Maxillofacial Surgery, Dental Institute Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

Corresponding Author: Sumit Mohan, Lecturer, Department of Conservative, Endodontics and Aesthetic Dentistry, Dental Institute, Rajendra Institute of Medical Sciences, Ranchi Jharkhand, India, Phone: +919259925980, e-mail: samsharma 770@gmail.com

The surgical removal of impacted mandibular third molar is one of the most commonly performed procedures.[5] The impacted third molars can be classified under Winters classification and Pell and Gregory classification,[6] which are the most commonly applied classification systems around the world. Classification of impaction helps to determine the course of the treatment. The criteria for prophylactic removal of third molars are still controversial. The angulation of impacted third molars can be used as a guide for its removal. The angulation, depth, and degree of impaction can be measured and classified using periapical radiograph and OPG.

The aim of the present study is to classify the impacted mandibular third molars in a subpopulation of Eastern India based on OPGs and to compare the results with other studies.

MATERIALS AND METHODS

The present retrospective radiographic study was conducted in Dental Institute, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India, to study the prevalence of eruption status of third molars in East Indian population.

A total of 600 OPGs were taken from the Department of Oral Medicine and Radiology from patients (300 males, 300 females) who visited the institute, within the age of 20 to 60 years. The OPGs were taken for these patients and were evaluated by a single operator according to Pell and Gregory classification to access the space and depth of impaction. The position of impacted third molars was evaluated using viewing box, charting paper, and a ruler by tracing the outline of the second and third molar along with the ascending ramus.

The occlusal plane line was drawn on the paper extending back to the ascending ramus. A perpendicular was drawn on the occlusal plane line touching the most distal surface of the second molar. The long axis of the second and third molar was also traced on it. The distance on the occlusal plane line from the point of intersection of the line passing from the distal surface of second molar to anterior border of ramus of mandible was measured to determine the space available for third molars. Mesiodistal width of the impacted third molar crown was recorded and the teeth were categorized as per Pell and Gregory classification (Table 1).

Table 1: Pell and Gregory classification[6]

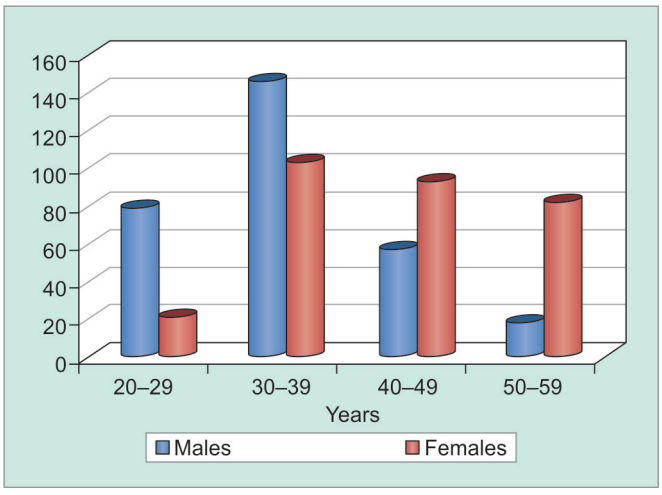
Class I	Impaction where there is sufficient space between ramus and distal of second molar for accommodation of mesiodistal diameter of third molar
Class II	Impaction where the space between ramus and distal of second molar is less than the mesiodistal diameter of third molar
Class III	Impaction where the third molar is embedded completely in ramus of mandible
Position I	The highest portion of the third molar is on the level with the occlusal plane
Position II	The highest portion of the third molar is between the occlusal plane and cervical line of second molar
Position III	The highest portion of the third molar is below the cervical line of second molar

The data were collected, computed, and analyzed using Statistical Package for the Social Sciences version 16.0 (SPSS Inc., Chicago). The level of statistical significance was set at 95% confidence interval ($p < 0.05$). The descriptive data were presented as mean and standard deviation (SD). The association between the categorical data was evaluated using chi-square test.

RESULTS

A total of 600 patients (n = 600; 300 males and 300 females) were included in this study. Age ranged from 20 to 60 years. Most of the patients were in the fourth decade of life, i.e., between 30 and 39 years (n = 250). Decade wise age distribution of the patients is shown in Table 2 and graphically represented in Graph 1.

Overall, 54.16% (n = 325) third molar impactions were recorded on the left side and 45.8% (n = 275) on the right side. The side involvement in both genders is shown in Table 3. Of the 325 impactions on the left side, 55.3% (n = 180) were of males and 44.6% (n = 145) were of female patients. Similarly, of the 275 patients, 92 (33.45%) were males and 183 (66.5%) were female patients (Table 3).



Graph 1: Age-wise distribution of the patients

Table 2: Age distribution of the patients

Age (years)	*n*	*Males*	*Females*	*Mean ± SD*	*p-value*
20–29	100	79	21	29 ± 2.06	0.16*
30–39	250	146	104		
40–49	150	57	93		
50–59	100	18	82		
	600	300	300		

*Statistically nonsignificant

Table 3: Side involvement of the patients

n	*Left side*		*Right side*		*p-value*
600	325 (54.16%)		275 (45.8%)		
	Males	Females	Males	Females	p = 0.27*
	180 (55.3%)	145 (44.6%)	92 (33.45%)	183 (66.5%)	

*Statistically nonsignificant

Table 4: Distribution of patients according to Pell and Gregory classification

Position	*n*	*%*	*Classs*	*n*	*%*
I	313	52.16	I	126	21
II	209	34.83	II	324	54
III	78	13	III	150	25
	600	100		600	100

According to Pell and Gregory classification, position I was found to be the most common type and was present in 52.16% patients (n = 313). Position III was present in 13% patients (n = 78). Similarly, class II was the most common type of impaction present in 54% (n = 324; Table 4).

DISCUSSION

Mandibular third molars are the most commonly impacted teeth among all the population groups around the globe. Most of the patients in this study were from the third decade of life (n = 250). Similar findings were also observed in different studies.[7,8] In the present study, equal numbers of patients of both the sexes were evaluated. However, different studies showed a predilection for females over males.[9-11] Hugoson and Kugelberg[12] and Hassan[13] reported an incidence of third molar impaction with no sex predilection.

Position I was the most common type of impaction, followed by positions II and III (Table 4). Level of eruption in this study is in accordance with many other studies carried out in various parts of the world.[11,14,15] However, fewer studies also concluded that position II was the most common type, followed by positions I and II.[16,17]

In the present study, the operators observed that 54% patients had class II impactions followed by class III and I. Various studies augment the results of the present study in this regard.[14,16] But these studies also inferred that class I was the second most common type followed

by class III. Clovis et al[17] observed class I relation as the most common type, followed by class II and III. However, in our study, class IIA was found to be the most common type of impaction pattern. The results of many previous studies also support the results.[18,19] This may be due to low correlation between the maxillofacial skeletal development and maturation of third molars resulting in reduced arch length between second molars and ascending ramus.

Another possibility is the difference in classification system as many studies take cementoenamel junction and alveolar bone height as the reference point and still others take occlusal plane as a guide for the measurement of position of the impacted teeth. Genetic and racial difference may be another important cause in the difference of results.

CONCLUSION

On comparing the results of our study with other regional studies, it was concluded that there was no universal consensus on incidence or patterns of impactions. This might be attributed to inadequate international standardization of evaluation criteria and to the difference in evaluation tools. There is plenty of scope to do standardized global studies with uniform guidelines and larger number of subjects that might help us to understand similarities and differences in the patterns of impaction on a global level.

REFERENCES

1. Bouloux GF, Steed MB, Perciaccante VJ. Complications of third molar surgery. Oral Maxillofac Surg Clin North Am 2007 Feb;19(1):117-128.
2. Stathopoulos P, Mezitis M, Kappatos C, Titsinides S, Stylogianni E. Cyst and tumors associated with impacted third molars: is prophylactic removal justified. J Oral Maxillofac Surg 2011 Feb;69(2):405-408.
3. Howe GL, Poyton HG. Prevention of damage to the inferior alveolar nerve during extraction of mandibular third molars. Br Dent J 1960;109(1):355-356.
4. Obiechina AE. Update in the technique of third molar surgery. Ann Ib Postgrad Med 2003;1(1):40-45.
5. Hochwald DA, Davis WH, Mortinoff JM. Modified distolingual splitting technique for removal of impacted mandibular third molars Incidence of postoperative sequelae. Oral Surg Oral Med Oral Pathol 1983 Jul;56(1):9-12.
6. Pell GJ, Gregory BT. Impacted mandibular third molars: classification and modified techniques for removal. Dent Digest 1933;39(2):330-338.
7. Almendros-Marqués N, Alaejos-Algarra E, Quinteros-Borgarello M, Berini-Aytés L, Gay-Escoda C. Factors influencing the prophylactic removal of asymptomatic impacted lower third molars. Int J Oral Maxillofac Surg 2008 Jan;37(1):29-35.
8. Gbotolorun OM, Olojede AC, Arotiba GT, Ladeinde AL, Akinwande JA, Bamgbose BO. Impacted mandibular third molars: presentation and post operative complications at the Lagos University Teaching Hospital. Nig Q J Hosp Med 2007 Jan-Mar;17(2):26-29.
9. Sandhu S, Kaur T. Radiographic evaluation of the status of third molars in the Asian-Indian students. J Maxillofac Surg 2005 May;63(2):640-645.
10. Nanda RS, Chawla TN. Status of third molar teeth. J Dent Assoc 1959 Feb;31(2):19-29.
11. Hattab FN, Rawashdeh MA, Fahmy MS. Impaction status of third molars in Jordanian students. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1995 Jan;79(1):24-29.
12. Hugoson A, Kugelberg CF. The prevalence of third molars in a Swedish population. An epidemiological study. Community Dent Health 1988 Jun;5(2):121-138.
13. Hassan AH. Pattern of third molar impaction in Saudi population. Clin Cos Invest Dent 2010;2(2):109-113.
14. Monaco G, Montevecchi M, Bonetti GA, Gatto MR, Checchi L. Reliability of panoramic radiography in evaluating the topographic relationship between the mandibular canal and impacted third molar. J Am Dent Assoc 2004 Mar;135(1):312-318.
15. Jerjes W, El-Maaytah M, Swinson B. Inferior alveolar nerve injury and surgery difficulty prediction in third molar surgery: the role of panomaric radiography. J Clin Dent 2006;17(2):122-130.
16. Susarla SM, Dodson TB. Estimating third molar extraction difficulty: a comparison of subjective and objective factors. J Oral Maxillofac Surg 2005 Apr;63(4): 427-434.
17. Clovis M, Eliston C, Filhio T, Lopes J. Third molar classification in the north west of Santa Catarina state of Brazil. Rev Odonto Ciencia 2006;21(2):55-66.
18. Jafar RO, Tin-Oo MM. Impacted third molars among patients attending hospital university Sains Malasyia. Arch Orofac Sci 2009;4(1):7-12.
19. Khan A, Khaitab U, Khan MT. Impacted mandibular third molar: pattern of presentations and post operative complication. Pak Oral Dent J 2010;30(1):307-312.