

STUDY OF A RELATIONSHIP BETWEEN AGENESIS & IMPACTED THIRD MOLAR (WISDOM) TEETH

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ABSTRACT

BACKGROUND: A major conclusion of evolution is that the human jaw has shrunk from its much larger ape size to the smaller modern human size as humans evolved. So there is no longer room in most of our mouths to house 32 teeth. Hence the last teeth we develop—our wisdom teeth—often become impacted, or blocked from erupting. This study makes an attempt to evaluate third molars—wisdom teeth in Indian population mainly Gujaratis. **MATERIALS AND METHODS:** This study was carried out on 350 (304 male & 46 female) mostly medical students and staff members of B. J. Medical College, Ahmedabad, Gujarat, India and few patients randomly chosen belonging to the age group 18-30. All cases were apparently healthy and most of the cases were vegetarian. For each case relevant history was taken – particularly about extraction of wisdom teeth and second molar teeth. Clinically absence of one or more third molars and partially erupted teeth were X-Rayed to detect developing and unerupted third molars. **RESULTS:** Out of 350 cases examined 22.9% (80/350) showed agenesis of one or more third molars. This missing tendency was more marked in females compare to males (14.1% vs. 11.3%). 11.63% (163/1400) molars were missing; maxilla dominated in agenesis and right side showed more of it. 15.4% of molars in males and 21.5% in females were found impacted. Mandibular third molar dominated in impaction. Mesioangular type was the most common; Distoangular impaction was almost exclusively confined to maxilla. 31.7% individuals showed both agenesis and impaction of third molars—females exceeding males. **CONCLUSION:** Thus our third molar teeth many a times get impacted, exhibit extreme diminution in size and also show agenesis as a final step towards their ultimate disappearance from our dentition.

Key words: Agenesis, Impacted, Wisdom teeth

INTRODUCTION

A major conclusion of evolution is that the human jaw has shrunk from its much larger ape size to the smaller modern human size as humans evolved. Our ancestors had larger jaws, so there was room in the human mouth for 32 permanent teeth, including third molars—wisdom teeth. But now our jaws are smaller. So, there is no room in most of our mouths to house 32 teeth. The third molars erupt last and one knows what happens to late comers. Firstly they disturb everybody—becoming a focus of attention. Secondly they may not find enough space and finally late comers are many times driven out or even not allowed to enter.

So our wisdom teeth often become impacted, or blocked from erupting. The result: the wisdom teeth are peculiar in size, shape and site etc., and hence they have become the center of attraction for everybody—laymen, dental surgeons, Anatomists, Anthropologists, and Orthodontists. These ‘centers of attraction’ have been the objects of study for several years and many facts have emerged establishing their importance. In dental terminology, an "impacted" tooth refers to a tooth that has failed to fully emerge into its expected position. This failure to erupt properly might occur because there is not enough room in the person's jaw to accommodate the tooth, the tooth's eruption path is obstructed by other teeth or because the angulation of the tooth. The prevalence of unerupted third molars varies widely and is influenced by age, gender and ethnicity. The failure of eruption of third molars is a very common condition and the extraction of impacted third molar teeth is one of the most frequent surgical procedures carried out.

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MATERIALS AND METHODS

This study was carried out on 350 (304 male & 46 female) mostly medical students and staff members of B. J. Medical College, Ahmedabad, Gujarat, India and few patients randomly chosen belonging to the age group 18- 30. All cases were apparently healthy and most of the cases were vegetarian. For each case relevant history was taken – particularly about extraction of wisdom teeth or second molar teeth. Clinically absence of one or more third molars and partially erupted teeth were X-Rayed to detect developing and unerupted third molars. However prior to radiographic examination, history was consulted to check clinical absence due to extraction. The observations were made on the following: Detection of agenesis of third molar. Detection of impaction and its classification into following:

- a) Mesioangular b) Distoangular,
- c) Horizontal, and d) Vertical

Impactions were detected and classified with the aid of both clinical and radiographic examinations. Since in most of the cases of selected age group, impacted teeth were unerupted, tooth to tooth contact was deemed essentials as basis of inspection. Winter’s¹ classification was followed but buccoangular and linguoangular, etc. types were excluded as perfect diagnosis in periapical X-Rays was not possible.

RESULTS

Agenesis of third molars Out of 350 cases examined 22.9% (80/350) showed agenesis of one or more third molars. Our rate of agenesis is located within the wide range of rates reported in other studies (9.0% to 30.8%).^{2, 3, 4, 5} Out of 304 males, 67 males were with agenesis of one or more

third molars, while 13 out of 46 females present the same. Thus missing tendency was more marked in females compared to males (28.3% vs. 22.0%), but not significant at the 5% level (p = 0.35). Out of 1,400 third molars (350 × 4) inspected, 163 (11.6%) were absent. Here also percentages of missing third molars were higher in female 14.1% (26/184) compared to males 11.3% (137/1216). This also not significant at the 5% level (p = 0.26). Table 1 makes it clear that agenesis was more commonly seen in Maxilla than mandibles; difference was significant at the 5% level (p = 0.0035). Missing third molars Maxilla 99 (60.7%) Mandible 64 (39.3%) 86 missing third molars were on the right side and 77 missing were on the left side out of total of 153 missing third molars. Thus right side dominated in agenesis. Agenesis of two molars was the most frequent (62) followed by that of four molars (48), one molar (29) and three molars (24). Out of 350 individuals, 104 were the victims of inspection. 28.4% (86/304) males and 39.1% (18/46) females exhibited impacted tooth or teeth— one more time more common in females compared to man (Table 2). However, difference in proportion is significant at 5% (p = 0.014). Moreover 15.4% molars in males and 21.5% of molar in females were found impacted. Classification of impactions revealed that Mesioangular (109/200 = 54.5%) was the most common of all, while Distoangular (15/200 = 7.5%) was the least observed (Table 2). However, left side showed little more impactions (106 vs. 94). In both sexes mesioangular impaction was more pronounced in mandible and distoangular impaction was more marked in the maxilla.

Table 1: Distribution of agenesis of third molar (N=163)

Sex	One (n=29)				Two (n=62)				Three (n=24)				Four (48)				Total
	Maxilla		Mandibles		Maxilla		Mandibles		Maxilla		Mandibles		Maxilla		Mandibles		
	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	
Males	7	4	8	5	19	19	8	6	5	7	5	4	10	10	10	10	137
Females	2	2	1	0	5	4	1	0	0	1	1	1	2	2	2	2	26

Table 2: Distribution pattern of different types of impaction (N=200)

Sex	Mesioangular (n=109)				Distoangular (n= 15)				Horizontal (n= 19)				Vertical (n=57)				Total
	Maxilla		Mandibles		Maxilla		Mandibles		Maxilla		Mandibles		Maxilla		Mandibles		
	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	R	Lt	Rt	Lt	Rt	Lt	
Males	11	9	35	35	4	7	1	1	3	1	5	9	17	17	3	8	166
Females	0	1	8	10	2	0	0	0	0	0	0	1	2	4	3	3	34

Table 3: Relation of agenesis and impaction

Sex	Cases of impaction with agenesis (%)	Cases of impaction without agenesis(%)	Total
Males	25 (29.1)	61 (70.9)	86
Females	8 (44.4)	10 (55.6)	18
Total	33 (31.7)	71 (68.3)	104

Out of 104 cases with third molar impaction, 33 (31.72%) were associated with agenesis of one or more third molars. This association was also more pronounced in females where 44.0% cases exhibited the phenomenon but not statistically significant at the 5% level (p = 0.20). No fourth molar was found. Absence of second molar was observed in only one case with an enlarged adjacent first molar and missing third molar.

DISCUSSION

The present study demonstrates that many individuals exhibit agenesis of third molars and our study (22.9%) compares well with those of Banks³ (19.7%) and Nanda and Chawla⁴ (25.8%). 22.0% of males and 28.3% of females exhibited agenesis which is little higher than in to the observations of Hellman (13.8% for females), Nanda and Chawla (12.7% for both the sexes). Agenesis was more commonly seen in the maxilla (60.7%) than mandible (39.3%). This finding conforms to those of Goblirsch² but is in sharp contrast to the findings of Nanda and Hellman. Similar is the case with the impacted teeth. In our study 28.4% of males and 39.1% of females showed impaction of one or more third molar. Nanda and Chawla also had a higher number of impacted teeth in females compare to male (25.0% vs. 16.0%). Higher percentage of Mandible teeth (61%) were impacted in comparison of maxilla teeth (39%). This tendency of more impaction in the mandible is also expressed by the results of Gunter⁶, Stones⁷, Nanda and Chawla⁴ etc. Few possess rudimentary third molars. Moreover there is a considerable correlation between missing, impacted and rudimentary third molars. No fourth molar was found. Absence of second molar was observed in only one case with an enlarged adjacent first molar and missing third molar. This finding is important when reduction of dentition is considered from evolutionary aspect. All these findings may lead one to consider our third molars as ‘vestigial’ structures. Darwin⁸, Gregory and Hellman and Gregory⁹ came to the conclusion that “third molars are decadent teeth which will eventually be lost from human dentition”. However, there are others who observed from different angles. As for instance, Goblirsch² finding low percentage of

missing teeth in his study maintained that the third molar was not a decadent tooth, and it would not disappear but would remain probably in a rudimentary condition. Nanda in his study mentions that differences in the incidence of absent third molars are associated with underlying genetic differences which make the individuals differ morphologically from each other. After adequately considering the options of above mentioned authors, the present study supports the claim of Nanda and Chawla⁴ but still favors the speculation that third molars are decadent vestigial teeth. Why then should these teeth become vestigial? This is another controversy as great as the previous one. Most advocate the lack of space as the main factor leading to this vestigial condition. Thoma and Goldman¹⁰, Salzmann¹¹, Archer and Nodine¹² – all believe that refinement of food led to lack of exercise to the jaws and teeth with resultant reduction in size. This disuse might have led to their agenesis. During the eruption, the calcified crowns of mandibular third molar are directed upwards and medially (mesially) and hence if rotation for final position fails to occur, they get impacted. An additional fact is lower third molar is larger than upper. Hence mandibular impactions are more frequent than maxillary. Again mesioangular type must be more common than others in mandibular teeth. The present study confirms all these facts. Maxilla dominated in agenesis and rudimentary teeth but the mandible presented more impaction as expected. Thus in addition to the direct relation between agenesis, impaction and rudimentary condition of third molar, there also exists indirect relation which is irregular in size, site and type.

CONCLUSION

Thus our wisdom teeth many a times get impacted, exhibit extreme diminution in size and also show agenesis as a final step towards their ultimate disappearance from our dentition- possibly and still one should not worry because ‘wisdom’ is not stored in the wisdom teeth.

REFERENCES

1. Winter GB. Impacted Mandibular Third Molar. St. Louis. American Medical Book Co. Quoted by Archer Ref. 1926.
2. Goblirsch AW. A study of third molar teeth. *J. Amer. Dent. Ass.* 1930; 21: 1849 – 1854.
3. Banks, HV. Incidence of Third Molar Problem. *J. Oral Surg.* 1934 8(1)
4. Nanda RS, Chawla TN. Status of Third Molar Teeth. *J. A. Ind. Dent. Asso.* 1959 31 (2), 19-29.
5. Hellman M. The wisdom teeth in our lower jaw. *Arch. Oral Path.* 1940 4: 171 – 186
6. Gunter, JH: Concerning impacted teeth. *Amer. J. Ortho & oral surg.* 1942. 28: 642-659
7. Stones HH, *Oral and Dental Diseases.* 4th Ed., Edinburgh and London-Livingstone. 1962
8. Darwin C., *The Decent of Man.* New York Lovell, Coryell and Company. 1881
9. Hellman M, Gregory WK, *The dentition of Dryopitheous and the origin of Man – Anthropological papers of the American museum of natural history – 28* 1926:
10. Thoma KH.: *Oral Surgery*, 4th Ed. 1 211. St. Louis. C. V. Mosby Co. 1963
11. Salzman, JA.: *Orthodontics: Principles and prevention.* Philadelphia, J.B. Lippincott, Co. 1957
12. Archer WH: *Oral surgery*, 3 Ed., Philadelphia, W.B. Saunders. 19-61.