ORIGINAL ARTICLE

Frequency of Mandibular Third Molar Impaction in Subjects with Different Facial Types in Southern Punjab

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ABSTRACT

Aims: To determine the frequency of mandibular third molar impaction in Dolicofacial and Brachyfacial face type.
Study design: Descriptive cross sectional study.
Duration: The study was conducted from March 2012 to March 2013.
Settings: Department of Orthodontics, Nishter Institute of Dentistry, Multan.
Methods: A total of sixty (60) patients (30 with Dolicofacial face type) and (30 with Brachyfacial face type) with either gender between 16-35 years of age with different type of malocclusion were included. **Results:** Majority of the patients were between 16-25 years of age and most of them were females while frequency of impaction in both facial types reveals 63.33%(n=19), among them 46.67%(n=14) in Dolicofacial face type and 16.67%(n=5) in Brachyfacial face type, which shows statistically significant higher incidence of impaction in Dolicofacial face type. We stratified our results according to gender also which shows higher incidence of impaction in females.
Conclusion: Dolicofacial face type subjects and female gender is more prone for impaction.
Keywords: Mandibular third molar impaction, Dolicofacial face type, Brachyfacial face type

INTRODUCTION

Tooth impaction is a pathological situation in which a tooth cannot, or will not erupt into its normal functioning position, unless facilitated by treatment[1-2]. Third molar is the most frequently impacted tooth. The prevalence of third molar impaction ranges from 16.7% to 68.6%[3]. Studies have shown higher frequency in white European females and Singapore Chinese females[1]. while this data is lacking in our country, especially in Southern Punjab.

Several causes have been suggested for lack of space between the anterior border of the ramus and distal of the second molar.[4] The impaction may be due to lack of mandibular development, lack of inter-proximal attrition due to modern diet(which do not allow the teeth to move in forward direction) or arch crowding[5].

One of the causes for the insufficient development at the retromolar area is the type of mandibular rotations, which also determines the type of the face whether it is brachyfacial or dolicofacial[6]. Mandibular ramus increases in size by resorption at its anterior border and deposition at the posterior surface. If the resorption is limited, the mandibular molar may be impacted. The variation in the ramus resorption is correlated with the direction of the condylar growth. Condylar growth in a predominantly vertical direction is associated with reduced resorption at the anterior aspect of the ramus and forward growth rotation of the mandible whereas backward directed growth at the condyle is associated with increased resorption and posterior growth rotation. Mandibular molar may tend to erupt more forward during the functional phase in patients with anterior growth rotation partly compensating for the limited amount of resorption at the anterior border of the ramus.[7-8] Brachyfacial(short) type of face is indicated cephalomatrcially by >93° facial axis angle or <26° mandibular plain angle. Dolicofacial (long) type of face is indicated cephalomatrically by <90° facial axis or >26° mandibular plane.

The aim of the study is to evaluate the frequency of mandibular third molar impaction in long/short face types so that the subjects with these type of faces may be determined at risk of impaction of mandibular third molar so that their timely management may be done accordingly.

MATERIAL AND METHODS

A total of 60 subjects (30 with Dolicofacial face type) and (30 with Brachyfacial face type) with either gender and 16-35 years of age with different type of malocclusion coming to Orthodontic Department of Nishter Institute of Dentistry were included while syndromic, asymmetric malocclusions, oral deformities and already under treatment of impaction were excluded from the study. The study was conducted from March 2012 to March 2013.

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The impaction was classified according to Pell and Gregory classification system[9]. This classification system includes two classes: 1, 2, 3 and A, B, C. Classes 1, 2 and 3 relate to the relationship of the third molar to the anterior border of the ramus. Class 1 when mesiodistal (MD) width of tooth is completely anterior to the ramus, Class 2 when partly within the ramus, and Class 3 when completely within the ramus. Classes A, B and C relate to the occlusal height as compared to the adjacent second molar. Class A when level with the adjacent tooth, Class B when between the occlusal and cervical margins of the adjacent tooth, and Class C when the occlusal is below the cervical margin. The facial type was determined by a measure of the facial axis angle.

The collected data was entered in SPSS version 16.0, quantitative variable i.e. age was computed as mean±sd while qualitative variables i.e. gender and impaction was calculated and presented as frequency and percentages in tabulated form. Chi square test was applied to determine any significance of impaction in both facial types. P value ≤0.05 was taken as significant.

RESULTS

Age distribution of the patients was done which shows that in both groups majority of the patients were between 16-25 years of age i.e. 18(60%) in Dolicofacial face type and 21(70%) in Brachyfacial face type group while 12(40%) in Dolicofacial and 9(30%) in Brachyfacial type of patients were between 26-35 years of age, mean age of the patients was calculated as 22.43±3.16 years (Table 1).

Gender distribution of the patients was done it shows 11(36.67%) male in Dolicofacial and 17(56.67%) in Brachyfacial face type while 19(63.33%) in Dolicofacial and 13(43.33%) in Brachyfacial type of face patients were females (Table 2).

Frequency of impaction in both facial types reveals 19(63.33%) were recorded in both groups, while it was recorded 14(46.67%) in Dolicofacial face type and 5(16.67%) in Brachyfacial face type, which shows statistically significant higher incidence of impaction in Dolicofacial face type. P value was 0.02 (Table 3).

We further analyzed incidence of impaction according to gender which shows that out of 14 cases in Dolicofacial face type 6(42.86%) were male and 8(57.14%) were females while out of 5 impacted cases in Brachyfacial face type 2(40%) were male and 3(60%) were females (Table 4).

Table 1: Age distribution (n=60)

Age in years	Dolicofacial face type (n=30)	Brachyfacial face type (n=30)
16-25	18(60%)	21(70%)
26-35	12(40%)	9(30%)

Mean±SD: 22.43±3.16

Table 2: Gender distribution (n=60)

Gender	Dolicofacial face type (n=30)	Brachyfacial face type (n=30)
Male	11(36.67%)	17(56.67%)
Female	19(63.33%)	13(43.33%)

Table 3: Frequency of impaction in both facial types (n=60)

Impaction	Dolicofacial face type (n=30)	Brachyfacial face type (n=30)
Yes	14(46.47%)	5(16.67%)
No	16(53.33%)	25(83.33%)

Table 4: Impaction according to gender (n=19)

Gender	Dolicofacial face type (n=14)	Brachyfacial face type (n=5)
Male	6(42.86%)	2(40%
Female	8(57.14%)	3(60%

DISCUSSION

Impactions may cause caries, localized periodontal issues, root resorptions, pericoronitis, infected cysts and neoplastic lesions. To avoid these complications timely management may be done by assessing the facial types. International data regarding frequency of the morbidity is showing a wide range i.e. 16.7% to 68.6%[3] while in our population, the frequency is not defined yet.

In our study, majority of the patients were between 16-25 years of age and most of them were females while frequency of impaction in both facial types reveals 19(63.33%), among them 14(46.67%) in Dolicofacial face type and 5(16.67%) in Brachyfacial face type, which shows statistically significant higher incidence of impaction in Dolicofacial face type. We stratified our results according to gender also which shows higher incidence of impaction in females. The findings of this study are in agreement with Breik O[4] who demonstrated almost two times greater risk of impaction in the Dolicofacial face type subjects.

The reason behind the greater incidence of impaction among dolicofacial face type may be due to the prolonged period facial growth in the brachyfacial patients in contrast to the dolicofacial, this hypothesis is in agreement with Nanda et al[10].

Similarly, another potential factor for higher impaction was the short mandibular length which is more prone in dolicofacial type faces, and it increases the mandibular third molar impaction, evident from a study by Eroz et al[11].

Regarding higher incidence of impaction in females is in accordance with Quek SL and Colleagues[12] who also recorded the higher incidence of impaction in females. However, we concluded that dolicofacial face type subjects and female gender is more prone for impaction.

Though, the results of the study are in agreement with other studies but the limitation of the study was sample size, however, the study may be considered as pilot and more studies with a larger size may be done to further authenticate the results of the study.

REFERENCES

1. Hassan AH. Pattern of third molar impaction in a Saudi population. Clinical, Cosmetic and Investigational Dentistry 2010;2:109-13.
2. American Association of Oral and Maxillofacial Surgery. Impacted teeth. Oral Health. 1998;88:31-2.
3. Quek SL, Tay CK, Tay KH, Toh SL, Lim KC. Pattern of third molar impaction in a Singapore Chinese population: a retrospective radiographic survey. Int J Oral Maxillafac Surg 2003;32:548-52.
4. Breik O, Grubor D. The incidence of mandibular third molar impactions in different skeletal face types. Australian Dental Journal 2008;53:320-4.
5. Sumitra, Tandur AP. Third molars and late mandibular incisor crowding---a review. J Ind Orthod Soc 2005;38:100-11.
6. Behbehania F, Årtunb J, Thalibc L. Prediction of mandibular third-molar impaction in adolescent orthodontic patients. Am J Orthodontics and Dentofacial Orthopaedics. 2006;130:47-55.
7. Bjork A. Sutural growth of the upper face studied by the implant method. European Journal of Orthodontics 2013;29:i82-8.
8. Lakhani MJ, Kadri W, Mehdi H, Sukhia H, Bano A. Anterior arch crowding —a possible predictor for mandibular third molar impaction. J Ayub Med Coll Abbottabad 2011;23:63-5.
9. Pell GJ, Gregory BT. Impacted mandibular third molars: classification and modified techniques for removal. Dent Digest 1933;39:330–8.
10. Nanda SK. Patterns of vertical growth in the face. Am J Orthod Dentofac Orthop 1988;93:103-6.
11. Eroz B, Ceylan I, Aydemir S. An investigation of mabdibular morphology in subjects with different vertical facial growth patterns. Aust Orthod J 2000;16:16-21.
12. Quek SL, Tay CK, Tay KH, Toh SL, Lim KC. Pattern of third molar impaction in a Singapore Chinese population: a retrospective radiographic survey. Int J oral and Maxillofacial Surg 2003;32:548-52.