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Original Research

Third molar impaction status of different mandibular length and facial types

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ABSTRACT:
Background: The major factors related to tooth impaction are lack of space, limited skeletal growth, increased crown size and late maturation of the third molars. The present study assessed third molar impaction status based on different mandibular length and facial type. **Materials & Methods:** 130 patients selected for the study underwent lateral cephalogram and panoramic radiograph (OPG). Parameters such as facial height, mandibular length and status of mandibular third molar was assessed. **Results:** Out of 70 males, impaction was present in 40 in which 13 had short, 22 had normal and 5 had long mandibular length. In females, 35 had impaction present in which 13 had short, 15 had normal and 7 had long mandibular length. In males in which impaction was present, 3 had Hypereuryprosopic, 12 had Euryprosopic, 7 had Mesoprosopic and 18 had Lepto/Hyperleptoprosopic facial index. In females, 6 had Hypereuryprosopic, 14 had Euryprosopic, 3 had Mesoprosopic and 12 had Lepto/Hyperleptoprosopic facial index. The difference was significant (P< 0.05). **Conclusion: A** significant association noted between mandibular third molar impaction and mandibular length. Maximum impaction was seen in patients with Lepto/Hyperleptoprosopic facial index.
Key words: Facial index, Hyperleptoprosopic, Mandibular third molar

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INTRODUCTION

Tooth impaction is a pathological situation in which a tooth cannot or will not erupt into its normal functioning position. In human dentition, the third molars have the highest impaction rate of all teeth.[1] The major factors related to tooth impaction are lack of space, limited skeletal growth, increased crown size and late maturation of the third molars.[2] Although impacted third molars may remain symptom free indefinitely, they could give cause for various symptoms and pathologies, such as pericoronitis, pain, swelling, distal caries, bone loss, root resorption of adjacent teeth, odontogenic cysts and tumors. It is considered that the occurrence of pathology resulting from impaction has a multifactorial origin.[3]

Several methods have been used to classify impaction. This classification is based on many factors, which are the level of impaction, the angulation of the third molars and the relationship to the anterior border of the ramus. The depth or level of maxillary and mandibular third molars can be classified using the Pell and Gregory classification system, where the impacted teeth are assessed according to their relationship to the occlusal surface of the adjacent second molar.[4]

The facial types may be classified basically into broad facial type (euryprosopic), normal facial type (mesoprosopic), and long facial type (leptoprosopic). Individuals with broad facial type were proposed to have greater horizontal occlusal plane length hence have more space for third molars to erupt whereas individuals with long facial type would have less space available for third molar eruption due to narrow arches.[5] The present study assessed third molar impaction status based on different mandibular length and facial type.

MATERIALS & METHODS

The present study comprised of 130 patients selected for the study after obtaining their written consent.

Data pertaining to them such as name, age, gender etc. was recorded. A thorough clinical examination was

performed. All underwent lateral cephalogram and panoramic radiograph (OPG). Parameters such as soft tissue height from nasion to menton, facial width from zygion to zygion, mandibular length from gonion to gnathion and facial index as: facial height ×100/facial width which as follows Hypereuryprosopic- <78.9%, Euryprosopic- 79–83.9%, Mesoprosopic- 84–87.9%, Leptoprosopic- 88–92.9% and Hyperleptoprosopic- >93%. Status of mandibular third molar was assessed. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Age group (Years)	Male	Female
18-20	32	25
21-23	16	20
>24	12	15

Table I shows that age group 18-20 years had 32 males and 25 females, 21-23 years had 16 males and 20 females and >24 years had 12 males and 15 females.

Table II Association between mandibular length and impaction based on gender

Gender	Mandibular length	Impaction		P value
		Yes	No	
Male	Short	13	8	0.02
	Normal	22	12	
	Long	5	10	
Female	Short	13	10	0.05
	Normal	15	12	
	Long	7	3	

Table II, graph I shows that out of 70 males, impaction was present in 40 in which 13 had short, 22 had normal and 5 had long mandibular length. In females, 35 had impaction present in which 13 had short, 15 had normal and 7 had long mandibular length. The difference was significant (P< 0.05).

Graph I Association between mandibular length and impaction based on gender

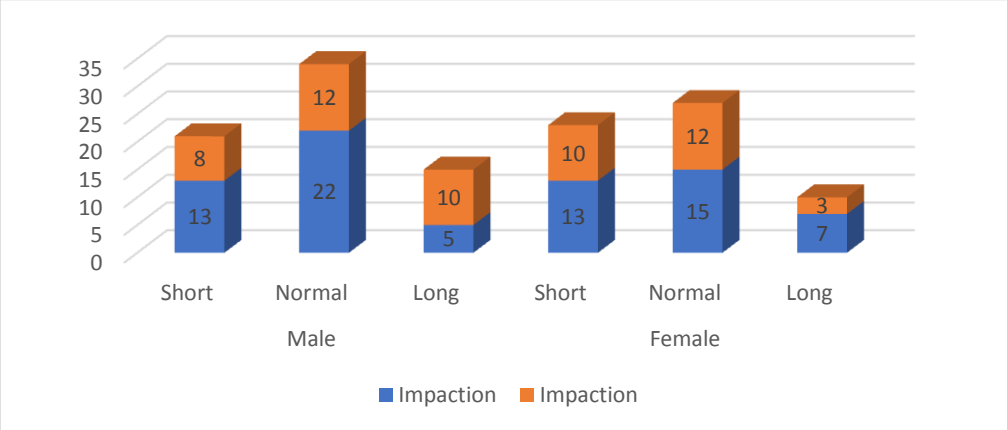


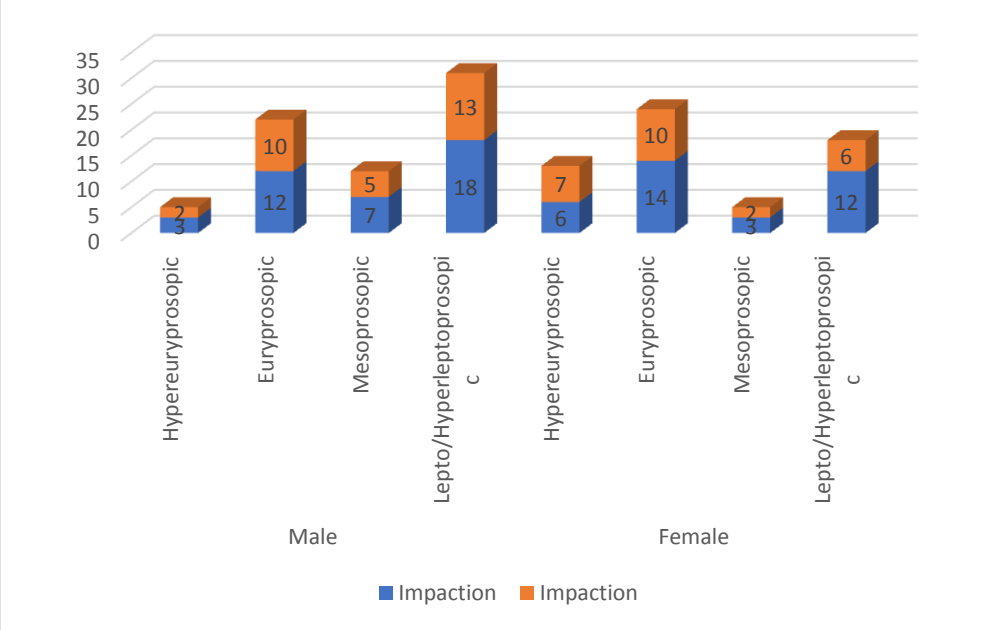
Table III Association between facial index and impaction based on gender

Gender	Facial index	Impaction		P value
		Yes	No	
Male	Hypereuryprosopic	3	2	0.04
	Euryprosopic	12	10	
	Mesoprosopic	7	5	
	Lepto/Hyperleptoprosopic	18	13	

Female	Hypereuryprosopic	6	7	0.03
	Euryprosopic	14	10	
	Mesoprosopic	3	2	
	Lepto/Hyperleptoprosopic	12	6	

Table III, graph II shows that in males in which impaction was present, 3 had Hypereuryprosopic, 12 had Euryprosopic, 7 had Mesoprosopic and 18 had Lepto/Hyperleptoprosopic facial index. In females, 6 had Hypereuryprosopic, 14 had Euryprosopic, 3 had Mesoprosopic and 12 had Lepto/Hyperleptoprosopic facial index. The difference was significant (P< 0.05).

Graph I Association between facial index and impaction based on gender



DISCUSSION

Impacted tooth is a tooth which is completely or partially unerupted and is positioned against another tooth, bone or soft tissue so that its further eruption is unlikely, described according to its anatomic position. The third molar impaction is occurring in about 73% of the young adults in Europe, these teeth generally erupt between the ages of 17 and 21 years.[6] It has also been reported that the third molar eruption varies with races, such as in Nigeria mandibular third molars may erupt as early as 14 years and in Europe it may erupt up to the age of 26 years. Factors such as the nature of the diet that may lead to attrition, reduced mesiodistal crown diameter, degree of use of the masticatory apparatus and genetic inheritance also affect the timing of third molar eruption. Various causes have been suggested in the literature for the impaction of the third molar. It has been suggested that the gradual evolutionary reduction in the size of the human mandible/maxilla has resulted in too small mandible/maxilla that may accommodate the corresponding molars.[7] It has also been found that the modern diet does not offer a decided effort in mastication, resulting in loss of growth stimulation of jaws, and thus the modern man has impacted and unerupted teeth. It has been suggested that the major basic cause of aberrant/impacted teeth is due to artificial feeding of babies, the habits developed during childhood, due to cross breeding, more consumption of sweet food by the children and youth which produces disproportion in the jaws and thus the teeth.[8] The present study assessed third molar impaction status based on different mandibular length and facial type.

In present study, age group 18-20 years had 32 males and 25 females, 21-23 years had 16 males and 20 females and >24 years had 12 males and 15 females. Hasan et al[9] study consisted of 170 patients who were assessed for facial type clinically based on facial index and mandibular length radiographically on lateral cephalogram. Of 170 patients, 18.8% of cases were with hypereuryprosopic profile, 33.5% of cases with euryprosopic profile, 24.7% with mesoprosopic profile, 21.8% with leptoprosopic, and 1.2% with hyperleptoprosopic profile were found. Nearly 42.2% of cases with hypereuryprosopic profile, 52.6% of cases with euryprosopic profile, 53.6% cases of mesoprosopic profile, and 60.3% cases of hyperleptoprosopic and leptoprosopic profile had impacted mandibular third molars. As for mandibular length assessment, 66% cases of short mandibular

length, 64.5% cases of normal mandibular length, and 27.9% cases of long mandibular length had impaction. We found that out of 70 males, impaction was present in 40 in which 13 had short, 22 had normal and 5 had long mandibular length. In females, 35 had impaction present in which 13 had short, 15 had normal and 7 had long mandibular length. Bjork et al[10] noted that, in cases of mandibular third molar impaction, the alveolar arch space behind the second molar was reduced in 90% of cases. The second most influential factor was mandibular length. A short mandibular length predisposed to mandibular third molar impaction. According to a study by Eröz et al[11] the mandibular length was shorter in the long-face facial type, consistently supporting the hypothesis that dolichofacial patients have an increased risk of third molar impaction.

We observed that in males in which impaction was present, 3 had Hypereuryprosopic, 12 had Euryprosopic, 7 had Mesoprosopic and 18 had Lepto/Hyperleptoprosopic facial index. In females, 6 had Hypereuryprosopic, 14 had Euryprosopic, 3 had Mesoprosopic and 12 had Lepto/Hyperleptoprosopic facial index. Nanda[12] also noted that the amount of time of growth differed between different facial types. It was shown that brachyfacial patients exhibited a prolonged period of facial growth in contrast to dolichofacial patients. This may also account for the greater amount of resorption of the anterior border of the ramus.

CONCLUSION

Authors found that significant association noted between mandibular third molar impaction and mandibular length. Maximum impaction was seen in patients with Lepto/Hyperleptoprosopic facial index.

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