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Original Research

Assessment of Third molar impaction in different facial types and mandibular length: An observational study

Dr. Abhishek Pathak

MDS, Oral And Maxillofacial Surgery, Ex SR Department of Dentistry JA Hospital, GRMC Gwalior, M.P.

ABSTRACT:

Background: 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 present study was conducted with the aim of analysing the third molar impaction in facial types and mandibular length. **Materials & methods:** 200 patients were enrolled in the present study. Clinical measurement was done for evaluating Facial height, and Facial width. Cephalometric measurements were done using scale and protractor. Mandibular length was assessed. Facial index was calculated based on method described by Martin and Saller in 1957. After calculation, facial indexing was divided into following types: Brachyfacial (broad face) and Dolicofacial (long face). All the results were recorded in Microsoft excel sheet and were analysed. **Results:** Short mandibular length was seen in 40.5 percent of the patients while normal length was seen in 59.5 percent of the patients. Significant association was seen between mandibular length and impaction. Dolico-facial facial index was seen in 53 percent of the patients. However; result was found to be non-significant. **Conclusion:** Dolicofacial pattern had enhanced percentage of impaction. However; significant results are still lacking and require further evaluation.

Key words: Facial type, mandibular length, Impacted

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Corresponding author: Dr Abhishek Pathak, MDS, Oral And Maxillofacial Surgery, Ex SR Department of Dentistry JA Hospital, GRMC Gwalior, M.P., India

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INTRODUCTION

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, these teeth generally erupt between the ages of 17 and 21 years.[1- 3]

Several local and systematic causes can substantially lead to the impaction of third molars. Normal eruption can be distorted or even prevented by the presence of local physical barriers such as an adjacent tooth, dense overlying bone or excessive soft tissue. Third molar is the most frequently impacted tooth. This variability can be explained by the variances in race and ethnicity, and their effects on epidemiological characteristics of third molar impaction.[3- 5]

The current general approach in dealing with impacted third molars is on the basis of clinical judgment; periodic evaluation by some clinicians and early extraction by others. Most expected complications following third molar surgery include sensory nerve damage, dry socket, pain, swelling, trismus, infection and hemorrhage [4- 6] 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- 7] Hence; the present study was conducted with the aim of analysing the third molar impaction in facial types and mandibular length.

MATERIALS & METHODS

The present study was conducted with the aim of analysing the third molar impaction in facial types and mandibular length. Ethical approval was obtained

from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. 200 patients were enrolled in the present study. Inclusion criteria included:

- Patients more than 18 years of age
- Patients with absence of gross facial asymmetry
- Patients with presence of impacted third molar

Clinical measurement was done for evaluating Facial height, and Facial width. Cephalometric measurements were done using scale and protractor. Mandibular length was assessed. Facial index was calculated based on method described by Martin and Saller in 1957. After calculation, facial indexing was divided into following types: Brachyfacial (broad face) and Dolicofacial (long face). All the results were recorded in Microsoft excel sheet and were analysed.

RESULTS

Mean age of the patients was 16.8 years. 56 percent of the patients were males while the remaining were females. Short mandibular length was seen in 40.5 percent of the patients while normal length was seen in 59.5 percent of the patients. Significant association was seen between mandibular length and impaction. Dolico-facial facial index was seen in 53 percent of the patients. However; result was found to be non-significant.

Table 1: Gender-wise distribution of patients

Gender	Number of patients	Percentage
Male	88	44
Female	112	56

Table 2: Association between mandibular length and impaction

Mandibular length	Number of patients	Percentage	p- value
Short	81	40.5	0.00 (Significant)
Normal	119	59.5	
Long	0	0	

Table 3: Association between facial index and impaction

Facial index		Number of patients	Percentage	p- value
Brachy-facial (Broad face)	Hypereuryprosopic	43	21.5	0.71
	Euryprosopic	41	20.5	
Dolico-facial (long face)	Mesoprosopic	58	29	
	Leptoprosopic	48	24	

DISCUSSION

Tooth impaction is a pathological situation where a tooth fails to attain its normal functional position. A relationship between the presence and the role of the mandibular third molar as a physical obstacle of the eruption path of the mandibular second molar has been hypothesized, even if the most recent evidences seem to confirm the results of Kaplan, who suggested that the impaction of the mandibular second molar can be related primarily to an arch length deficiency. When absence of the second molar is observed at least two years behind is scheduled time, a radiographic examination is required to disclose if the cessation of eruption of the second molar is associated to an abnormal inclination of the wisdom teeth. There are, however, conflicting opinions about the need or not to extract the gem of the third molar to facilitate the alignment of the second molar as not all authors believe that this germ can be an obstacle to the eruptive path of the second molar.[8- 11] Hence; the present study was conducted with the aim of analysing the third molar impaction in facial types and mandibular length.

In the present study, mean age of the patients was 16.8 years. 56 percent of the patients were males while the remaining were females. Short mandibular length was seen in 40.5 percent of the patients while normal length was seen in 59.5 percent of the patients. Hasan K M et al assessed whether an association exists between different facial types and mandibular length to impaction of mandibular third molars. The study consisted of 170 patients who were assessed for facial type clinically based on facial index and mandibular length radiographically on lateral cephalogram. The impaction status was determined clinically and radiographically on orthopantomogram. The facial type was categorized as euryprosopic (broad face), mesoprosopic (normal facial type), leptoprosopic (long face), hypereuryprosopic (extra broad face), and hyperleptoprosopic (extra long face). 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.[12]

In the present study, significant association was seen between mandibular length and impaction. Dolico-facial facial index was seen in 53 percent of the patients. However; result was found to be non-significant. O Breik et al assessed whether different patterns of facial growth lead to a different incidence of mandibular third molar impaction. They hypothesized that those with predominantly horizontal (brachyfacial) would have lower incidence of mandibular third molar impaction compared with those with a predominantly vertical growth pattern (dolichofacial). Ninety-eight dental records were sourced from the records of orthodontic patients in the Royal Dental Hospital of Melbourne and all lateral cephalometric radiographs and orthopantomograms were assessed. The degree of impaction was determined by the Pell and Gregory system, and the facial type categorized by the facial axis angle. The overall rate of mandibular third molar impaction was 58.76 per cent. Those with a facial axis angle >93 (brachyfacials) demonstrated an almost two times lower incidence of mandibular third molar impaction as compared to subjects with a facial axis angle <87 (dolichofacials).[13] According to Breik, mesioangular impaction of the mandibular M3 was most common in mesofacial subjects, followed by brachyfacials and dolichofacials. On the other hand, Breik showed that horizontal impaction was mostly common in dolichofacials followed by brachyfacials and mesofacials.[14]

CONCLUSION

Under the light of above obtained results, the authors conclude that dolicofacial pattern had enhanced percentage of impaction. However; significant results are still lacking and require further evaluation.

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