VARIATION OF CUSPS AND ROOTS OF UPPER WISDOM TOOTH IN PATIENTS VISITING KHYBER COLLEGE OF DENTISTRY

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Available Online 22-February 2020 at http://www.jkcd.edu.pk
DOI: https://doi.org/10.33279/2307-3934.2020.0113

Abstract

Objective: *To determine the variation of cusps and roots of maxillary 3rd molars.*

Material and Methods: *This descriptive cross-sectional study was carried out on 100 extracted 3rd molars. Informed consent was taken from the patients. The teeth with carious lesions and damaged crown were excluded from the study. Data was collected and entered into SPSS for the calculations of percentage and frequencies.*

Results: *A total of 100 maxillary 3rd molars were collected in the department of surgery. Among maxillary 3rd molars most prevalent was tricuspid 44 % and 43% followed by tetracuspids 40% and 16 % of the teeth had five cusps. Only 2% of the third molars had more than five cusps. The most prevalent were fused roots that were 46 %and 68% are followed by two roots and three roots in right and left quadrants respectively.*

Conclusion: *3rd molars are the most variable teeth in the oral cavity. cusps of the 3rd molars vary from tricuspid to more than 5cusp. Root variation is more than crown variation. Genetic, ethnic and geographical factors affect the morphology of cusps and roots.*

Keywords: *Third molar, Tricuspid, Fused roots, Ethnic, Geographic variation*

INTRODUCTION

Wisdom tooth is the term used for 3rd molar, it is derived from Latin word dens sapientiae. In Spanish countries, word wisdom tooth is known as molar of judgement because it appears in the oral cavity when the person has better sense of judgment.[1] The third molars are the most variable tooth in the oral cavity. Morphological variation in cusps and roots has always been the topic of research for long time. Anthropological studies need the determination of these structural variations in and it should be determined in different population or a race. Previous studies reported that the variation in the morphology of the tooth is the indicator of genetic disturbances.[2]

During the cap stage of development enamel knot release signaling molecules which determine the cuspal morphology of teeth.[3] The development of a tooth is a complex event in which epithelial mesenchymal interaction occurs. There are expression of signaling proteins within developing teeth which are responsible for crown patterns.[4] Maxillary 3rd molars predominantly exhibit 3 cusps or four cusps in its occlusal table. There are usually four cusps on

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maxillary 3rd molars, two buccal and two palatal. Nonetheless, for this tooth, there are great variances among third molars, and a true specific description is still yet to know in the case of 3rd molars.[5]

A study reported a maxillary 3rd molar having six cusps along with dens evaginatus.[6] Signaling protein during the development of teeth determine the location and patterning of teeth.[4] The current study aims to determine the frequency of cusps and roots of the maxillary 3rd molar. Studies in Asia have reported the higher frequency of fusion of roots between 19.5% to 41.4%. Lower frequency on the radicular fusion has been reported in the united states and Brazil which revealed 0.9% and 7.8% respectively.

The natural feeding has the great advantage to ensure the growth of the dental maxillary apparatus and to influence the development of its component elements.[7] The industrialization has now a day changed the fibrous diet to the refined one. The need for strong mastication has been reduced which has also reduced the lengths of the jaws.[8] These evolutionary changes have a great impact on the need of research on the masticatory apparatus.

Present study aims to assess the variation in the cusps and roots of maxillary 3rd molar.

MATERIALS AND METHODS

The study was descriptive cross-sectional study, ethical consent was taken from the ethical committee of Khyber college of dentistry. Convenient sampling was done, patient visited for the extraction of maxillary 3rd molar were included in the study. Informed consent was taken from the patients. Maxillary 3rd molars were collected after the extraction is done in the maxillofacial surgical department. Sound maxillary third molar were included in the study. maxillary third molars with carious lesion and damaged crown morphology were excluded from the study. Data was collected and entered in SPSS and the percentage, frequencies were calculated.

RESULTS

A total of 100 maxillary 3rd molars were collected in the department of surgery. Among maxillary right 3rd molar cusp 44 % were tricuspid, followed by tetracuspid 37%, five cuspid 17% and only 2% had more than five cusps. Similarly, roots of the same side show that 46% were fused roots 40% were two rooted and 14% were three rooted teeth. (Table1)

Table 2 presents the morphology of maxillary left 3rd molar with 43% tricuspid, 41% tetracuspid followed by 5 cuspid which is 15%. A single left 3rd molar had more then 5 cusps. Among these 3rd molars 68% had fused roots 24% were two rooted and 8% had 3 roots

Table 1: Maxillary right 3rd molar cusps and roots

Types of cusps	Frequency	Percent	Types of roots	frequency	Percent
tricuspid	44	44	fused roots	46.0	46
Four cuspid	37	37	two roots	40.0	40
Five cuspid	17	17	three roots	14.0	14
more then five cusp	2	2			
Total	100	100.0	Total	100	100

Figure 1: Presenting maxillary 3rd molars

Table 2: Maxillary left 3rd third molar cusps and roots

Types of cusps	Frequency	Percent	Types of roots	frequency	Percent
tricuspid	43	43	Fused roots	68.0	68
Four cuspid	41	41	Two roots	24.0	24
Five cuspid	15	15	Three roots	8.0	8
More then five cusp	1	1			
Total	100	100	100	100	100

DISCUSSION

The nature through evolutionary changes is bringing about great variation in the structures of the body. The things which are not in use is getting decreased in size or obliterating from the earth. The morphology of the last molar is sometimes more important particularly in those situations where the endodontist and the prosthodontist wants to conserve it due to early loss of Ist and 2nd molars. The wisdom tooth is the last molar whose agenesis is common in 25 to 40% of the population.[8] The genes influence the development of teeth and their morphology.[4] The present study revealed different cusps patterns in maxillary 3rd molars. Accessory or supernumerary cusps are common variations of tooth morphology that are occasionally encountered clinically.[6] In the crown morphology of maxillary 3rd molar six cusps have been reported in the literature.[6] Variation in the cuspal morphology is not unusual in upper wisdom teeth.[9] Tetra cuspid and tricuspid 3rd molars are commonly observed in the crown morphology of the present study. This may be due to ethnic, geographical as well as genetic differences amongst the population.

Yang et al in his study on the Chinese population revealed prevalence of fused roots in maxillary 3rd molars.[10] In that study, it was also observed that C shaped roots were common in the Chinese population along with 51% of the maxillary third molars had three separate roots; the other half had fused or conical roots.[10] The present study revealed the same findings. In contrast to this study maxillary third molar with four roots was also reported in a previous study.[11] This may be due to ethnic, geographical as well as genetic differences amongst the population.

Sidow et al. have investigated 150 maxillary extracted third molars in a study which revealed that maxillary 3rd molar had one root in 15 % of the teeth, 32 % had two roots, 45 % had three roots and 7% had four roots. The single-root teeth presented the most unusual morphology, the number of canals ranging from one to six. The authors suggest an in vivo study of the morphology of the treated root of the third molar. It would help the dentist understand the clinical effects of wisdom tooth root anatomy.[12]

There are more than 300 genes responsible for the process of odontogenesis a. Defects in these genes are one of the reasons for an alteration of the morphology of tooth.[13] Fibroblast Growth Factors (FGF) stimulate the proliferation of mesenchymal as well as epithelial cells, and they may also regulate the growth of the cusps. Characteristics in shape, size, and structure of teeth are recognized as indicators of dental differences in populations. For example, Africans have bigger teeth with thicker enamel, whereas Europeans have smaller teeth and a reduction in tooth mass[14]

CONCLUSION

Crown of the upper wisdom teeth vary greatly from tricuspid to five cuspid teeth. Roots also show great variation from fused to four roots. They have identified at least three and a maximum of five cusps.

ACKNOWLEDGEMENTS:

I would like to thank DR. Waqar Ali, Assistant Professor, Community Medicine, Rehman Medical College for supervising us throughout the course of this study and helping us guide through challenging situations.

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