

Prevalence and Characteristics of Distomolar Teeth Among Dental Patients of Dental Section Sandeman Provincial Hospital, Quetta

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ABSTRACT

Background: A distomolar is a supernumerary tooth that is located distal to the third molars. They appear more frequently in men than in women. Several theories had been suggested to explain this phenomenon with the “Dental Lamina Hyperactivity Theory” to be the most accepted. Supernumerary molars (distomolars) are usually impacted. They can be associated with complications or stay asymptomatic.

Objective: This study aimed to determine the prevalence and characteristics of distomolar teeth among dental patients reported to the Radiology Department Dental Section Sandeman Provincial Hospital Quetta.

Methods: This descriptive retrospective cross-sectional study was conducted in Dental Radiology Department. Data were obtained from digital panoramic radiographs of patients who reported to the Radiology Department Dental Section in Sandeman Provincial Hospital Quetta from 1st January 2019 till 31st December 2019.

Results: Among 500 panoramic radiographs, 6 (0.012%) distomolars were noted, 4 (0.8%) were detected in maxilla 1 (0.2%) in mandible and 1 (0.2%) recorded in both jaws. 5 (1%) were noted impacted and only 1 (0.2%) was erupted. Morphologically 5 (1%) maxillary distomolars were tuberculated and 1(0.2%) mandibular distomolar was conical in shape.

Conclusion: Even though the frequency of distomolars is low, the dental practitioner should always be aware of the presence of distomolars in radiographs or clinically.

Keywords: Prevalence, characteristics, distomolars, teeth, dental patients.

INTRODUCTION

The term supernumerary teeth (ST) may be defined as the presence of an additional number of teeth either in primary or permanent dentition. This condition is also termed hyperdontia [1]. They may be unitary or many, unilateral or bilateral, located in maxilla or mandible or both jaws and may be present in both types of dentition, may be erupted or impacted, symptomatic or asymptomatic, they appear in all areas of dental arches. Mostly they are nonsyndromic clinical findings but sometimes they may present as a clinical finding of certain syndromes such as Cleidocranial dysplasia, Down syndrome, Ehler Danlos syndrome and cleft lip and palate [2].

Hyperdontia can be classified according to the shape and location of the tooth in the dental arch. According to a location in the dental arch they are categorized as mesiodens, paramolar, distomolar and parapremolar. According to the morphology they are grouped of teeth that are rudimentary or supplemental. Additional tooth in the maxillary incisor region is called mesiodens. A

distomolar is located distal to the third molar, paramolar is situated either buccally or lingually to a molar. Distomolar teeth along with paramolar are also termed as fourth molar or distodens. They are either eumorphic or dysmorphic in shape. The majority of times it expresses as tuberculated or molariform shape or they may be peg or conical in shape. In various studies it was observed that a fourth molar exhibited three different forms; a paramolar shape with one root, a premolar shape that only has a crown but no root and a rudimentary conical shape [3, 4].

The prevalence of hyperdontia ranges between 0.1 to 4%, it is more frequent in males as compared to females with a ratio of 2:1. The frequency of distomolar teeth is from 0.02 to 0.16 % and is more commonly present in the maxilla with a percentage of 1.15% and 0.021% in the mandible. The prevalence of bilateral distomolar teeth is uncommon and present in only 0.07% of the population [5, 6]. The ratio of erupted distomolars to impacted ones is 1:5. According to research carried out on the Greek population its prevalence is 5-times lower in primary dentition as compare to permanent dentition. The rate of incidence of distomolars in the Indian and Turkish communities is 2.1% and 0.32% respectively. Research conducted in Pakistan on orthodontic patients, frequency is 0.3% to 3.9% and the ratio of distomolars is 0.43% [7].

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Received: August 03, 2021; Revised: October 12, 2021; Accepted: October 22, 2021
DOI: <https://doi.org/10.37184/lnjpc.2707-3521.3.17>

The exact etiology of distomolar teeth is unknown but current knowledge suggests that they develop as a result of both genetic and environmental factors. A theory suggests that these teeth are created as a result of the dichotomy of tooth buds resulting in two equal or different sized tooth structures. Hyperactivity theory is a well-supported and accepted one that states that these additional denticles are formed as a result of local hyperactivity of dental lamina [8, 9]. Genetics is an important etiological factor in the development of distomolars. Genetic research states that their inheritance pattern is autosomal recessive with lesser penetrance in females and different authors mention a high frequency in East Asian origin and African origin as compared to whites [10, 11].

It is important to identify the presence of distomolars clinically and radiographically for definitive diagnosis and treatment. Two-dimensional techniques that are panoramic and periapical radiographs may be inadequate to detect the exact location and relation of these teeth to adjacent structures, these techniques are routinely used but due to the superimposition of anatomical structures, these teeth are overlooked on conventional radiographs. Cone Beam Computed Tomography (CBCT) provides exact and accurate information on pathological conditions such as odontomas, developmental anomalies and traumatic injuries. Advantages of CBCT are multidimensional view of dental tissues, short exposure time and less radiation dose compared to other conventional radiographs and ease of data transfer [12].

The majority of times undetected distomolar teeth does not cause any complication but sometimes they are associated with some complications such as delay or failure of eruption of a permanent tooth, tooth displacement, crowding, root resorption, dilacerations, loss of vitality of adjacent teeth, periodontal disease, cyst, neoplasms and neuralgias. The treatment depends upon the position of distomolar teeth in the dental arch and also how it affects adjacent hard and soft tissue structures. Extraction is considered to be a treatment of choice if it is causing any above-mentioned problems but it can also be kept under observation without extraction, if not causing any functional or aesthetic interference. Indications for careful observation of distomolars without removal are where satisfactory eruption has occurred, no active orthodontic treatment is required there is no associated pathology such as a cyst or where extraction will damage the vitality of related teeth [13]. The purpose of this study was to analyze the prevalence and characteristics of distomolar teeth among the dental patients reported to the Radiology Department Dental Section Sandeman Provincial Hospital Quetta.

MATERIALS AND METHODS

This descriptive retrospective cross-sectional study was conducted at the Dental Radiology Department Dental Section Sandeman Provincial Hospital Quetta. Ethical

approval was granted by the Head of Dental Section Sandeman Provincial Hospital Quetta. A previously conducted study showed a prevalence of 2.1% [14] at 95% confidence interval and 1.5% margin of error a sample of at least 351 patients needs to be studied. Data were obtained from digital panoramic radiographs of patients who reported to the Radiology Department Dental Section Sandeman Provincial Hospital Quetta from 1st January 2019 till 31st December 2019. Those patients who visited the Radiology Department Dental Section Sandeman Provincial Hospital Quetta for their panoramic radiographs (OPG) and patients from 18 to 60 years having their 3rd molars were considered in this study. Patients without any radiographic proof are excluded from this study. Demographic variables including age and gender, location, eruption status and morphology were recorded. Data was analyzed on statistical package SPSS version 21. Data were summarized as frequency and percentages.

RESULTS

A total of 500 panoramic radiographs were reviewed. According to the recorded data of 500, 296 (59.2%) were males and 204 (40.8%) were female (**Fig. 1**). The mean age of the total patients was 40 years. Among 500 panoramic radiographs 6 (0.012%) distomolars were noted, 4 (0.8%) were detected in maxilla 1 (0.2%) in mandible and 1 (0.2%) was recorded in both jaws. While 5 (1%) were noted impacted and only 1 (0.2%) erupted. Morphologically 5 (1%) maxillary distomolars were tuberculated and 1 (0.2%) mandibular distomolar

Table 1: Characteristics of Distomolar teeth found in the studied sample.

Characteristics of Distomolars		n	Percentage
Gender	Distomolar in Male	5	1.6
	Distomolar in Female	1	0.49
Location	Maxilla	4	0.8
	Mandible	1	0.2
	Maxilla/ Mandible	1	0.2
Eruption status	Erupted	1	0.2
	Impacted	5	1
Morphology	Conical	1	0.2
	Tuberculate	5	1



Fig. (1): Distomolar teeth.

was conical in shape. The distribution of distomolar teeth according to gender, location, eruption status and morphology is depicted in Table 1.

DISCUSSION

Distomolars are also termed retromolar due to their distal or posterior location with respect to third molars. They are considered the second most common type of supernumerary teeth after mesiodens [15]. Distomolars can be heteromorphous or eumorphous and they may be erupted or impacted. Various researches have been carried out regarding the frequency of distomolar teeth in different communities. Fourth, fifth, sixth and even seventh molars have been observed, among them, distomolars were noted most commonly [16].

The reasons for the occurrence of distomolar teeth are still not clear, different studies showed different results about the frequency of distomolar teeth in patients. Few theories are there to advocate the presence of distomolars, namely; atavism theory, dichotomy theory, and dental lamina hyperactivity theory. Among these theories, the dental lamina hyperactivity theory is most widely used. Dental lamina hyperactivity theory states that distomolar teeth may occur due to local, independent and conditioned hyperactivity of dental lamina.

The prevalence of distomolar teeth in this study was 1.2%. The frequency of distomolars in the present study was higher than that found in a previous study done on the Turkish population by Arslan who reported a value of 0.57%. Kara noted the frequency of distomolars was 0.33%, Casseta recorded the prevalence of about 0.18%. Another study, reported the percentage of distomolar teeth on Indian residents, by Gopakumar reveals that distomolars were noted in 0.03% of the population [17]. Prevalence of distomolars in the present study runs side by side with the study of Stafene who noted that the frequency of distomolar teeth was 1% and Luten who proposed a recorded percentage of distomolars about 2% [18, 19].

The frequency of distomolar prevalence differs, depending upon the population under study. Different studies showed different results about the occurrence of distomolar, such as the work of Luten showed significant presence of distomolars in their study [19]. However, Esenlik studied the occurrence of distomolar in their population [20]. Another study conducted on the Caucasian population reported a range between 0.1% and 3.8% of supernumerary molars in their sample [21]. Similarly, Anibor reported a prevalence of 12.7% for Nigerian residents in his work [22]. These differences are may be due to different demographic characteristics of the population but still, no concrete evidence is available to justify the presence of distomolar in patients.

In the current study distribution of distomolars in males is 5 (1.6%) and in females, 1 (0.49%) and the ratio of distomolars between males and females was 5:1. A

study done by Watanable reported that the male-female ratio was 2:1 [23]. The results in the current study are similar to the work of Watanable who also reported the prevalence of distomolar is more in males as compared to females. Similar results of higher incidence of distomolar in males are reported by Yousaf who found male and female ratio was 9:2 [24]. In this study, the prevalence of distomolars among males and females is higher than the study carried by Yousaf. The higher prevalence in males may be due to the relation of supernumerary teeth with an autosomal recessive gene that has a greater male infiltration [25].

In the current study, the number of distomolars in the maxilla is 4 (0.8%) while in the mandible it is 1 (0.2%) and 1 (0.2%) of distomolar was noted in both jaws. A study done by Ohata reported 1.15% of distomolars in the maxilla and 1 (0.021%) distomolars in the mandible [26]. Ohata also determines the higher distomolar frequency in the maxilla than mandible which is similar to this study. The same study reported cases of distomolars in the maxilla were (0.8%) on both right and left maxilla, but it is in contrast with the mandible in which (0.2%) distomolar were noted unilaterally. Another study done by Mitsea reported the prevalence of maxillary distomolar teeth between 0.1% to 0.95%. The prevalence of distomolar teeth in our study is similar to a study of Mitsea however the findings of our study are in disagreement with the work of Kurt's who reported 9 (0.063%) bilateral maxillary distomolars and no case in the mandible [27]. Our study recorded that distomolar had a predilection for maxilla and noted the bilateral occurrence of distomolars that is different from the previous work that mentions distomolars mainly occur solitary and bilateral occurrence is rare [28].

In the current study 5 (1%) distomolars are impacted and seen as multicuspid teeth only 1 (0.2%) of distomolar noted erupted. Distomolars can erupt completely and line up themselves in the dental arch or they can show partial or complete impaction [29]. In some cases impacted distomolars may cause some pathologies, on the other hand, some impacted distomolars remain asymptomatic. In the current study, we found that all the distomolars are asymptomatic and there is no radiopaque and cystic lesion noted on impacted distomolars. The present study agrees with Schofield's work who states that mostly distomolars remain impacted and rarely erupt in the oral cavity and are generally discovered through radiographs [30].

A distomolar tooth can have normal morphology with a completely developed crown, single root and distinct from adjacent third molar or it can be different from normal morphology. The distomolars in the present study exhibited two different forms tuberculation and conical. We noted 5 (1%) distomolars have a tuberculated shape while 1 (0.2%) has a conical morphology. A study done by Casseta declares eight out of 13 supernumerary molars had a tuberculate shape while the other 5 had a conical

shape [31]. This is in agreement with Casseta's work. In this study, we disagree with Kaya who found higher proportions of conical distomolars in his study [32].

It was observed that the size of distomolars was smaller as compare to erupted 3rd molars. We agree with the work done by Stafene who states that most of the distomolars were blunt multicuspid and are much smaller than the 3rd molar [33]. The maxillary distomolars were likely to dwarf as compare to the mandibular one. This could be due to the less bone mass in the posterior maxillary tuberosity region while in the mandible comparatively more bone mass in the ramus area makes it easier for the tooth to develop but could also leave the tooth more prone to impaction [34].

In conclusion, permanent dentition consists of three molars in both maxilla and mandible. Supernumerary teeth that occur distally to 3rd molar tooth describe as distomolar teeth or fourth molar. They were noted mostly in the maxilla. They may erupt normally or remain impacted and distomolar teeth could be symptomatic or asymptomatic. The size of distomolar teeth is usually smaller than the 2nd and 3rd molars.

CONCLUSION

This study profiled demographic data as well as the location, impaction and shape of distomolars teeth were noted by using panoramic radiographs among the patients in the Dental Section Sandeman Provincial Hospital Quetta. The reported data showed that distomolars were mostly found in males as compared to females and are most frequently located in the maxilla. They may erupt normally or remain in an ectopic position, but a majority of times found impacted. A variety of complications are associated with distomolars. Even though the frequency of distomolars is low, the dental practitioner should always be aware of the presence of distomolars in radiographs or clinically. Further research works are needed to identify the prevalence and characteristics of distomolars among different populations.

ETHICS APPROVAL

This article does not contain any studies performed on human subjects, as it was a retrospective study done after the approval of Head of Dental Section Sandeman Provincial Hospital Quetta.

CONSENT FOR PUBLICATION

Not applicable.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGEMENTS

We would like to express our sincere and deep appreciation to our friends and loved ones, whose

encouragement and help have always been a sense of inspiration during this study. We are also thankful to the entire team of Dental Radiology, Dental Section Sandeman Provincial Hospital Quetta for their help and support. We are also thankful to Mr. Muhammad Ali from Balochistan University of Information Technology, Engineering and Management Sciences Quetta for their statistical support. This project was purely self-administered.

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