

PREVALENCE AND PATTERNS OF IMPACTED MAXILLARY CANINE IN A PESHAWAR SAMPLE

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ABSTRACT

Maxillary canines are important aesthetically and functionally, but impacted canines are more difficult and time consuming to treat. Permanent maxillary canine impaction has been reported in about 1% to 5% of the population.

The objective of this study was to determine the prevalence of impacted maxillary canine in patients visiting to Khyber college of dentistry, Peshawar.

A total of 500 patients of 15 years and above were examined clinically. Those having maxillary canine impaction were advised Anterior Occlusal View and panoramic radiograph to determine the patterns of impaction by vertical parallaxing technique. Data were processed in SPSS version 16.0. The chi-squared test was used to reveal any differences in the distribution of impacted maxillary canines when stratified by gender and location (left or right). A p-value of <0.05 was accepted as statistically significant.

Out of 500 patients examined 20(4%) had maxillary canine impaction. The mean age was 19.05±3.15 years. Age was ranged from 15 to 25 years. Female to male ratio was 1.85:1. Females had more impaction of maxillary canine than males (p=0.000). Palatal were the most common in males while buccal were in females. Left side was commonly involved in impaction in both genders.

Key Words: *Impacted maxillary canine, patterns of impaction, vertical parallaxing technique.*

INTRODUCTION

Maxillary canines are important aesthetically and functionally, but impacted canines are more difficult and time consuming to treat.¹ The eruption of permanent maxillary canine represents a complex series of events, mostly genetically based, whereby eruptive movements of the tooth germ taking place at a predetermined time and route enable the maxillary canine to find its antagonist at a predetermined occlusal plane.² Maxillary canines are among the last teeth to develop in anterior maxilla and have the longest period of development. They also have the longest and most devious path of

eruption from the formation point lateral of the pisiform fossa to the final position in the dental arch.³

Impacted teeth are those with a delayed eruption time or that are not expected to erupt completely based on clinical and radiographic assessment.⁴ In impacted teeth, root development might have finished, but unaided eruption is not expected to occur. Occasionally, malposition of a permanent tooth bud can lead to eruption at a wrong place. This condition is called an ectopic eruption and the tooth is called ectopic tooth.⁵ Permanent maxillary canine impaction has been reported in about 1% to 5% of the population.^{6,7} This makes the maxillary canine the second most commonly impacted tooth, after third molars.⁸

The following factors are known to play role in impaction of maxillary canine: (a) tooth size-arch length discrepancies (b) prolonged retention or early loss of the deciduous canine (c) abnormal position of the tooth bud (d) the presence of an alveolar cleft (e) ankylosis (f) cystic or neoplastic formation (g) dilaceration of the root (h) iatrogenic origin and (i) idiopathic condition with no apparent cause.^{9,10}

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Impacted canines vary greatly in the inclination and location and can lead to resorption of neighboring incisors, as well as cystic degeneration. Some common sequelae of canine impaction are: (i) Labial or lingual malpositioning of the impacted tooth (ii) Migration of the neighboring teeth and loss of arch length (iii) External root resorption of the impacted tooth as well as the neighboring teeth (iv) Infection particularly with partial eruption resulting in pain and trismus and (v) Referred pain.¹¹

It is known that the impaction of maxillary canines occurs twice as much in females than males.¹² In general, it has been reported that palatal impactions occur more frequently than buccal impactions with a ratio from 2:1 to 6:1.^{13,14} However, it was mentioned that there seems to be more buccal impactions in the Asian population. This finding refers to the possibility of a greater occurrence of buccal maxillary canine impactions in Asians.¹⁵

The present study was done to determine the prevalence of impacted maxillary canine in patients visiting to Orthodontics department, Khyber college of dentistry, Peshawar.

METHODOLOGY

This study was conducted on a sample of Peshawar population that had been treated in the Orthodontics Department at Khyber college of dentistry Peshawar from August 2013 to February 2014. The study consisted of clinical and radiographic examination of 500 patients coming to the department for treatment. The patients were examined for any evidence of impacted maxillary canines (i.e., visual inspection, palpation, and/or radiographs). Clinical examination was done by conventional methods and included whole-arch inspection; palpation to identify any retained deciduous canine; visualization of the canine "bulge," splaying of the lateral incisors, lost space, crowding, or fibrous tissue overlying the canine region, and mobility of the primary canines; and a review of the patient's chronological age and history of dental eruption/exfoliation patterns. Clinical examination was supplemented with a radiographic evaluation to produce an accurate diagnosis. Panoramic and Anterior Occlusal Radiographs, were used to determine the position of the impacted canine by parallaxing technique for patients having canine impaction. All radiographs were placed on a viewing screen and the area surrounding the radiographs was shielded with a dark material to block interfering lateral light and improve viewing contrast. All radiographs were assessed by two experienced investigators.

The inclusion criteria

- Age of above 15 years

- Both genders
- Pakistani nationality

Exclusion criteria

- Any disease, trauma or fracture of the jaw that might have affected the normal growth of permanent dentition.
- Possessing many impacted teeth and, thus, possibly implying the presence of a syndrome e.g. Down's syndrome or cleidocranial dysostosis.
- Exhibiting cases with a definite obstacle, like odontomas or supernumerary teeth.

Data were processed in SPSS version 16.0. The chi-squared test was used to reveal any differences in the distribution of impacted maxillary canines when stratified by gender and location (left or right). A p-value of <0.05 was accepted as statistically significant.

RESULTS

Out of 500 patients examined 20(4%) had maxillary canine impaction. The mean age was 19.05 ± 3.15 years. Age was ranged from 15 to 25 years. Female to male ratio was 1.85:1. Females had more impaction of maxillary canine than males. (Table 1) Palatal were the most common in males while buccal were in females. Table 2. Left side was commonly involved in impaction in both genders. (Table 3)

TABLE 1: DISTRIBUTION OF MAXILLARY CANINE IMPACTION ACCORDING TO GENDER

Gender	N*	n**	%age	p-value	χ^2
Male	200	7	1.40		
Female	300	13	2.60	0.000	5.684
Total	500	20.0	4.0		

*No of patients examined

** No of patients having maxillary canine impaction

χ^2 = chi square value

TABLE 2: PATTERNS OF MAXILLARY CANINE IMPACTION

Gender	Pattern of impaction		
	Buccal	Palatal	Buccopalatal
Male	2(10%)	5(20%)	0(0%)
Female	6(30%)	4(20%)	3(15%)
Total	8(40%)	9(45%)	3(15%)
P-value*	0.444	0.035	0.168
χ^{2***}	0.586	4.432	1.90

*Asymp. Sig. (2-sided)

**Pearson Chi-Square

TABLE 3: DISTRIBUTION OF MAXILLARY CANINE IMPACTION ACCORDING TO SIDE

Gender	Pattern of impaction		
	Unilateral Left	Right	Buccopalatal
Male	2(10%)	0(0%)	5(20%)
Female	6(30%)	4(20%)	3(15%)
Total	8(40%)	4(20%)	8(40%)
P-value*	0.069	0.035	0.035
χ^{2**}	5.348	4.432	4.432

*Asymp. Sig. (2-sided)

**Pearson Chi-Square

DISCUSSION

Besides third molars, the impaction of maxillary canines is the most common eruption disturbance in permanent dentition. There has been a long history of research on this subject. Through this research, the general tendencies of maxillary canine impaction have been repeatedly proven by many researchers.^{6,7} The most representative tendency would be a prevalence for impaction that is greater in females and greater on the palatal side.¹⁶ Comparison of the results from this study with those reported previously is complex because of differences in sample size, grouping methods, clinical examination methods, and the radiographic techniques used to make the diagnosis.

Numerous studies¹⁷⁻¹⁹ have been conducted to investigate the incidence and prevalence of impacted maxillary canines in different populations. The prevalence of maxillary canine impaction appears to vary within a range of 0.9-3.5%, depending on the population examined. In this study, the overall incidence of impacted maxillary canines was 4%, suggesting that ethnicity and geographic location have influence on the incidence of maxillary canine impaction. Female patients have been reported to be more commonly affected^{19,20} and current results support this conclusion. It is possible that this higher frequency in female patients is associated with the smaller cranium in female patients, which may lead to diminution of the facial skeleton²¹ and the jaws. This would be expected to increase the probability of maxillary canine impaction. Other authors^{19,21} have hypothesized that the higher female incidence may simply reflect a trend whereby female patients are more likely to seek orthodontic treatment and thus have their impacted canines discovered.

Sridharan et al²² conducted a study to determine the prevalence of impacted maxillary canine in 14069 patients by intraoral examination, palpation, dental records and followed by radiographs. It was found that the prevalence of canine impaction was 2.6% in

males and 3.6% in females suggesting that prevalence of impacted maxillary canines is more in females than males and it was statistically significant. The overall prevalence for maxillary impacted canines was found to be 3% which are comparable to the current study. The small dissimilarities may be attributed to the sample selection, method of the study and area of patient selection, which suggest racial and genetic differences.

Ericson²³ in his study has found that the rate of impacted maxillary canines was in the range of 0.9-2%.⁸ One more study by Stewart showed that the prevalence of impacted canine was in the range of 1-3%, and it was also found that impaction of maxillary canines have 10 times more prevalence than the mandibular canines.

Ali Gashi et al²⁵ investigated the incidence of impacted maxillary canines in a Kosovar population using the records of 8101 patients. The chi-squared test was used to examine potential differences in the distribution of impacted maxillary canines stratified by gender, age, location (left or right), and position. It was found that the incidence of impacted maxillary canines was 1.62%. There was statistically significant difference among gender. Ages were in the range of 9 to >20 years, with a mean age of 24.38 ± 8.09 years. Of these subjects, 99 (75.57%) had unilaterally impacted maxillary canines, while 32 (24.43%) had bilateral impactions, a statistically significant difference. Impacted canines in 92 subjects (70.2%) were palatally placed, and 18 (13.7%) were labially placed. In the current although the sample size was much smaller than Ali Ghashi the overall prevalence was greater (4%) which indicates ethnic differences. In this we select age range from 15 years and above to make sure the fully eruption of canine which is not impacted (eruption time 11-13 years in maxilla).

CONCLUSION

The prevalence of maxillary impacted canine was 4% which is higher than previous studies.

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