

## Prevalence of Maxillary Canine Impaction in Orthodontics At Eastern Riyadh Specialized Dental Center

Ahmed Ali Al Fawzan<sup>1</sup>, Moataz Alruwaithi<sup>2</sup>, Sultana Alsadoon<sup>3</sup>

<sup>1</sup> Orthodontic Demonstrator, College Of Dentistry, Qassim University, Ksa

<sup>2</sup> Orthodontic Consultant, Eastern Riyadh Specialized Dental Center, Ksa

<sup>3</sup> General Dentist, Armed Forces Hospital, Ksa

**Abstract:** Objective of this study is to highlight the prevalence of impacted canines in patients who had attended the orthodontic screening clinic at Eastern Riyadh Specialized Dental Center, Kingdom of Saudi Arabia, from January 2014 to December 2016. This was a retrospective study on 507 panoramic radiograph. All panoramic radiographs were taken with standardized equipment and specifications. Frequency and prevalence of the patients were recorded. Total number of males was 203 (40%) and 304 (60%) was female. The mean age of the patients was 16.78 years. A total number of 38 (7.5) patients was diagnosed with impacted canine 23 (4.5%) in females. Impacted canines were seen mostly as unilateral 24 (63.2%). Left was the most common site of impaction 16 (66.7%).

**Keywords:** canine impaction, maxillary canine.

### I. Introduction

With the exception of the third molars, impaction of the maxillary permanent canines is the most common form of tooth impaction.<sup>(1)</sup> An impacted tooth is one that is erupted, partially erupted, or unerupted and will not eventually assume a normal arch relationship with the other teeth and tissues.<sup>(2)</sup> The eruption of permanent teeth includes series of events, mostly genetically based, whereby tooth germ eruption taking place at a predetermined time and path enables the tooth to find its antagonist at the occlusal plane. As the eruption is a complex process, it is not uncommon that problems may arise, which lead to failure of eruption.<sup>(3,4)</sup> The most common causes for canine impactions are usually localized and are the result of any one, or combination of the following factors: (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.<sup>(5,6,7)</sup> Relatively recent studies into the frequency with which maxillary canine impaction occurs in the general population have indicated prevalence from 0.27% in a Japanese population<sup>(8)</sup> to as much as 2.4% among Italians,<sup>(9)</sup> with the condition affecting female patients 2.3 to 3 times more frequently than males.<sup>(8, 9, 10, 11)</sup> The aim of the present study was to determine the prevalence of impacted maxillary canine in a sample of patients attending the Orthodontics Clinic at Eastern Riyadh Specialized Dental Center (ERSDC), KSA.

### ii. Materials And Methods

This retrospective study involved 507 panoramic radiographs of subjects aged 13 to 32 years who had attend the orthodontic screening clinic at Eastern Riyadh Specialized Dental Center, Kingdom of Saudi Arabia, seeking orthodontic treatment from January 2014 to December 2016. All panoramic radiographs were taken with standardized equipment and specifications. The tooth was considered impacted when it was not aligned with the rest of the teeth in either of the dental arches or has no chance to erupt in its position. Data regarding age, sex, number of impacted teeth, arch involved, and type of maxillary canine impaction either unilateral or bilateral from patients records and panoramic radiographs were examined by a single investigator<sup>1</sup>. Data collected was entered into a spreadsheet (Excel 2010) and analyzed subsequently using (SPSS) version 16.0. The prevalence of impacted canine teeth in relation to age, gender and type was assessed and displayed by frequency and percentage. The *p* value was analyzed by using the Pearson Chi-square test.

### III. Result

There were total 507 panoramic radiographs subjected for evaluation, among them 203 (40%) were male and 304 (60%) were female (Table 1, Figure 1). The age ranges from 13 to 32 years with a mean age 16.78 years (Table 2). A total number of impacted maxillary canines were found 38 (7.5%) of which were 15 (3%) in males and 23 (4.5%) in females (Table 3, Figure 2). Unilateral impaction was seen higher in both male and female patients than bilateral impaction with 24 (63.2%) out of 38 case of impaction (9 in males and 15 in

females) (Table 4, Figure 3). Out of 24 case of unilateral impaction 16 (66.7%) were in the left side (6 in male, 10 in female) (Table 5).

**Table 1.** Number and percentage of male and female patients

Gender	No.	Percentage
Male	203	40%
Female	304	60%
Total	507	100%

**Table 2.** Descriptive statistics of age of all sample and mean age of female and male patient

Gender	Mean	Std. deviation
Male	16.25	3.57
Female	17.14	4.01
Overall	16.78	3.86

**Figure 1.** Percentage of male and female Patients.

**Table 3.** Number and percentage of canine impaction in each gender and among all the sample

Gender	Criteria	Canine impaction		Total
		No impaction	Impaction	
Male	Count	188	15	203
	% gender	92.6%	7.4%	100.0%
	% Total	37.1%	3.0%	40.0%
Female	Count	281	23	304
	% gender	92.4%	7.6%	100.0%
	% Total	55.4%	4.5%	60.0%
Total	Count	469	38	507
	% Total	92.5%	7.5%	100.0%

**Figure 2.** Number and percentage of canine impaction in each gender and among all the sample

**Table 4.** Number and percentage of unilateral vs bilateral canine impaction and among all sample and within each gender

Gender	Criteria	Canine impaction		Total
		Unilateral	Bilateral	
Male	Count	9	6	15
	% impaction	60.0%	40.0%	100.0%
	% Total	1.8%	1.2%	3.0%
Female	Count	15	8	23
	% impaction	65.2%	34.8%	100.0%
	% of Total	3.0%	1.6%	4.5%
Total	Count	24	14	38
	% impaction	63.2%	36.8%	100.0%
	% of Total	4.7%	2.8%	7.5%

**Figure 3.** Percentage of unilateral Vs bilateral canine impaction and among all sample and within each gender.

<b>Table 5.</b> Number and percentage of Right vs Left canine impaction and among all sample and within each gender				
Gender	Criteria	Canine impaction		Total
		Right canine	Left canine	
Male	Count	3	6	9
	% Unilateral	33.3%	66.7%	100.0%
	% Total	0.6%	1.2%	1.8%
Female	Count	5	10	15
	% Unilateral	33.3%	66.7%	100.0%
	% of Total	1.0%	2.0%	3.0%
Total	Count	8	16	24
	% Unilateral	33.3%	66.7%	100.0%
	% of Total	1.6%	3.2%	4.7%

#### **IV. Discussion**

Any permanent tooth in the dental arch can be impacted, but the teeth most frequently involved in a descending order are the mandibular and maxillary third molar, the maxillary canines, the mandibular and maxillary second premolar, and maxillary central incisors.<sup>(12)</sup> Maxillary canines impaction are common finding in orthodontic practices. Many studies have been performed to evaluate their prevalence of impaction.

The present study, conducted to determine the prevalence of impacted maxillary canine in a sample of 507 patients using panoramic radiographs. The data indicated that the prevalence of maxillary canine impaction was more than those reported in other studies. The present study has shown the prevalence of maxillary canine impaction to be 7.5 %, which is much higher than the percentage of 3.8% reported in other study.<sup>(13)</sup>

In this study, the prevalence of unilateral impaction was statistically significant higher (63.2%) than bilateral impaction (36.8%) *p* value of 0.002. This in agreement with a study conducted by Ali Gashi et al which showed that unilateral impaction was more common (75.6%).<sup>(14)</sup> Left maxillary canine impaction was higher (66.7%) than right side impaction (33.3%) which is consistent with studies conducted by Alrwuili et al and Ali Gashi et al.<sup>(13,14)</sup> This study shows that females have higher percentage of impaction (7.6%) than male patient (7.4%). Most of studies about impacted maxillary canine; for example Altaee in her study on patients from Ramadi city in Iraq stated that female: male ratio was 2:1. Sridharan et al., found prevalence of 2.6 % in males and 3.6 % in females.<sup>(15, 16, 17)</sup>

Early detection, accurate treatment planning and execution are the main stay for these dental conditions. If properly and timely done, might prevent the patient from esthetic and functional discrepancies. A dental surgeon should also have an idea of the prevalence of these dental anomalies among the population he or she is dealing with in dental offices. By doing so, early detection and better treatment results can be achieved which will benefit the patient in long term.<sup>(13)</sup>

#### **V. Conclusion**

The overall prevalence of impacted maxillary canines is found to be 7.5% among the selected sample of patients attending orthodontic treatment screening clinic in ERSDC. The occurrence of left maxillary canine impaction is higher than right maxillary canine.

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