

The Prevalence of Impacted Permanent Canines in a Saudi Subpopulation: An Original Research.

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Abstract: Objective: The purpose of this study was to investigate the incidence of impacted permanent canines in patients attending AL Rass General Hospital, Surgery department. **Methodology:** The study consisted of a retrospective analysis of the panoramic radiographs of 930 patients attending the surgery clinic of AL Rass General Hospital between 2016 to 2017. the chi-squared test was used to examine potential differences in the distribution of impacted canines stratified by gender, age, location (left or right), and position (upper or lower). $\alpha < 0.05$ was accepted as statistically significant. **Result:** It was found that the incidence of impacted canines was 9.6%. Of the 89 impacted maxillary canines, 59 were in female patients and 30 were in male patients, not a statistically significant difference ($P=0.149$). Ages were in the range of 13 to 33 years, with a mean age of 24.81 years. Of these subjects, 87 (9.4%) of these impaction cases were found to be in the maxilla while 7 (0.8%) were in the mandible. This difference was statistically significant (P value= 0.000). In 74 patients (8%), we found unilateral impaction, whereas the remaining 15 (1.6%) were bilateral which was also not statistically significant ($P=0.254$). Right maxilla was the most common site of impaction 53 (5.7%). **Conclusion:** The incidence of impacted canines in the sample of Saudi population was 9.6%, which is higher than the findings from previous studies.

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Keywords: impaction, impacted canine, impacted maxillary canine.

1. Introduction:

An impacted tooth is one that is erupted, partially erupted, or un-erupted and will not eventually assume a normal arch relationship with the other teeth and tissues. ⁽¹⁾ Canine plays a role in functional occlusion and form the foundation of an esthetic smile. ^(2,3) The maxillary permanent canines impaction is the second most common form of tooth impaction after third molars. ⁽¹⁾ The most common causes for canine impactions are usually localized and are the result of any one, or combination of the following factors: prolonged retention or early loss of the deciduous canine, tooth size-arch length discrepancies, the presence of an alveolar cleft, abnormal position of the tooth bud, cystic or neoplastic formation, ankylosis, dilacerations of the root, iatrogenic origin and idiopathic condition with no apparent cause and some systemic factors such as: endocrine deficiencies, malnutrition, fever, or irradiation. ⁽⁴⁻⁸⁾ 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 ⁽¹⁰⁾ to as much as 2.4% among Italians, ⁽¹¹⁾ with the condition affecting female patients 2.3 to 3 times more frequently than males. ⁽¹⁰⁻¹¹⁾ Both the maxillary and mandibular canines may be impacted, although maxillary canine impaction is considerably more common. ⁽¹²⁾ Unilateral impaction is more prevalent than bilateral impaction. ⁽⁶⁻⁸⁾

The aim of the present study was to determine the prevalence of impacted canine in a sample of patients attending the sugary Clinic at AL Rass General Hospital, KSA.



Figure 1: shows Upper right canine impaction.



Figure 2: shows bilateral canine impaction.



Figure 3: shows canine impaction on the upper left and lower right sides.

2. Materials and Methods:

In this retrospective study with ethical approval code EA/6005/2018, a total of 930 (380 males and 550 females) panoramic radiographs of subjects aged between 13 to 33 years who attend the surgery department of ARrass General Hospital were collected. Panoramic radiographs were taken using an Orthopantomograph® OP100 D unit (Instrumentarium Corp., Imaging Division, Tuusula, Finland). All these panoramic radiographs were examined for the presence of canine impaction. The canine 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. (figure 1,2,3) The data regarding the age, gender, number of impacted canines, position (maxilla or mandible), location (unilateral or bilateral) from the radiograph has been recorded by single examiner. (13)

Statistical analysis:

Table 1: Distribution of impacted canines according to gender

Gender	N (sample size)	n (impacted canine)	Percentage within impaction	Percentage within gender
Males	380	30	33.7	7.9
Females	550	59	66.3	10.7
Total	930	89	100	9.6
Chi-Square Test		P= 0.149		

Ages were in the range of 13 to 33 years, with a mean age of 24.81years (Table 2). 87 (9.4%) of these impaction cases were found to be in the maxilla while 7 (0.8%) were in the mandible. This difference was statistically significant (P value= 0.000) (Table 3) (chart 2).

Table 2: Mean age of sample.

Mean	N	Std. deviation
24.81	930	5.139

Data collected was entered into a spreadsheet (Excel 2010) and analyzed subsequently using (SPSS) version 21. 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. A P value of < 0.05 was accepted as statistically significant.

3. Result:

There was a total of 930 (380 were males and 550 were females) panoramic radiographs for evaluation. From them 89 (9.6%) were found to have impacted canines, 30 (33.7%) of those were males and 59 (66.3%) were females, which there was no statistically significant difference (p=0.149) (Table 1) (chart1).

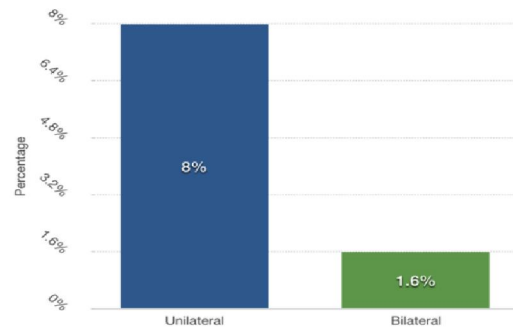


Chart 1: Gender distribution of impacted canines.

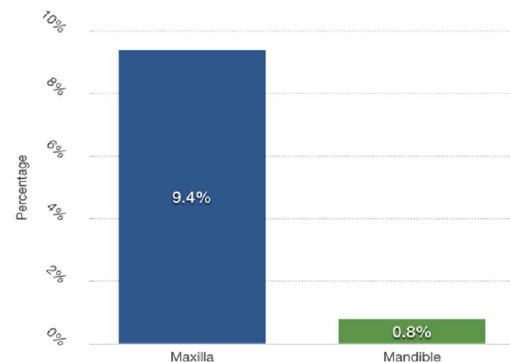


Chart 2: Distribution of impacted canines according to location.

Table 3: Distribution of impacted canines according to location (maxilla or mandible).

Location	N	%
Maxilla	87	9.4
Mandible	7	0.8
Chi-Square Test	P=0.000	

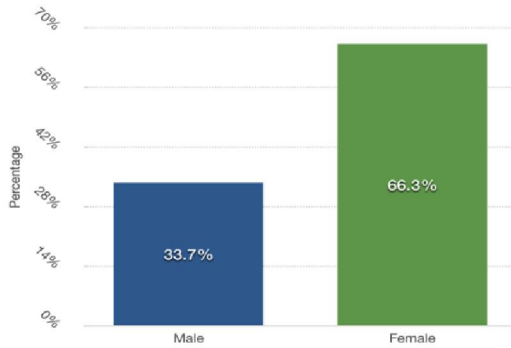


Chart 3: Distribution of impacted canines according to side.

In 74 patients (8%), we found unilateral impaction, whereas the remaining 15 (1.6%) were bilateral. This difference was also not statistically significant (P=.254) (Table 4) (chart 3).

Table 4: Distribution of impacted canines according to side.

Side	N	%
Unilateral	74	8
Bilateral	15	1.6
Chi-Square Test	P=.254	

The highest prevalence of impacted canine has been found in right maxilla 53 (5.7%) while the lowest value was in left mandible 5 (0.5%) (Table 5) (chart 4).

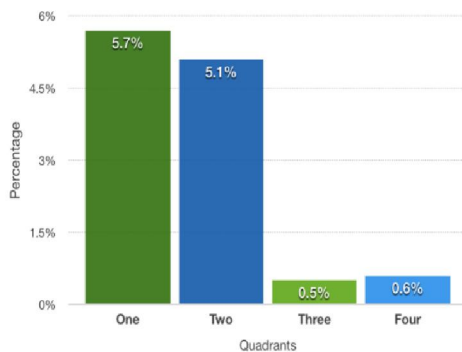


Chart 4: Frequency of impacted canines in each quadrant.

Table 5: Frequency of impacted canine in each quadrant.

Quadrant	N	%
One	53	5.7
Two	47	5.1
Three	5	0.5
Four	6	0.6

4. Discussion:

Comparison of the results from this study with those reported previously is complex and not precisely comparable due to differences in sample size, examination methods, grouping methods, and the radiographic techniques used to make the diagnosis.

Numerous studies have been conducted to investigate the incidence and prevalence of impacted maxillary canines in different populations. (13-18) however, few studies studied the prevalence of impacted permanent canines (upper and lower) at the same time. (19,20)

The prevalence of maxillary canine impaction appears to vary within a range of 0.9–7.5%, depending on the population examined as reported by other studies, while this percentage is much higher in our study of 9.6%. (11,20-23) the 7.5% rate reported by ALFawzan A. et.al. of a Saudi population is the closest to our study suggesting that ethnicity and geographic location have influence on the incidence of canine impaction. (13) The present study found that there was a female predilection for canine impaction which was in accordance with several studies reported in literature, but in few studies, there was no statistical significance. (15,20) According to a study by Cooke J. described that the female patients have small cranium, which may lead to abnormalities of the facial skeleton and the jaws. (24) This would be expected to increase the probability of maxillary canine impaction in such cases. Another theory was introduced in several studies 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. (21,25) Most of the studies published on impacted maxillary canines have predilections of unilateral impactions such as in Kosovar, Mexican, Chinese and Saudi populations, (13-15,17,18,20) on the contrary, a study on a Brazilian population concluded that Majority of the impacted canines were bilateral in nature. (26) Our findings are in line with previous studies mentioned that unilateral impaction is more prevalent than bilateral. Furthermore, the side of the impacted maxillary canines varied widely. In Saudi (Riyadh) and Kosovar

populations, left canine impaction was more frequent.^(13,14) In contrast, Mexican and Turkish populations had higher impaction tendency for right canines which were consistent with our findings.^(15,20) The present study found high frequency of impacted maxillary canines in a Saudi subpopulation. However, the study has several limitations, including difficulty in comprehensively tracing every appropriate dental record, note, and orthopantomographs. Some dental records also contained incomplete data.

5. Conclusion:

Canine impaction occurs with a frequency of 9.6% in this population. The female patients had higher prevalence than male. The occurrence is higher in maxilla than mandible and in unilateral than bilateral. The most common affected side is the right maxilla followed by left maxilla then right mandible and lastly left mandible.

Recommendations:

Further studies are likely to be required to identify the etiology behind the high prevalence of impacted maxillary canine teeth in Saudi subjects.

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