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Prevalence and Classification of Maxillary Canine Impaction among Iraqi patients at An-Najaf City

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Abstract

Canines play an important role in functional occlusion, occlusion protection and in aesthetic smile. So the proper knowledge of permanent canine impaction incidence and its position is essential before orthosurgical procedures. The aim of this study is to highlight the prevalence and difficulty of the treatment of maxillary impacted canine. A 1995 panoramic radiographs were taken, total number of males were 737 (37%) and 1258 (63%) were females, a 79 (3.9%) patients were diagnosed with canine impaction where females were 3.6 times more than males, also most patients diagnosed with unilateral, right-sided and type II impactions.

Keywords: *Maxillary canine, impacted canine, classification*

Introduction

An impacted tooth is any tooth that fails to erupt into the oral cavity and occupies its proper anatomical position after completion of its root formation. Maxillary canine represents the second most common form of impaction after wisdom teeth[1,2,3]. The prevalence of canine impaction ranging from 0.27% in Japanese population[4] to as much as 7.5% among Saudi people[5]. females seem to be affected by 2.3-3 times more than males[4,6,7,8]. Panoramic radiographs assist in localization of impacted canines in antero-posterior position in relation to adjacent teeth, classification of maxillary canine impaction described according to the long axis angles of canine with occlusal plane[9]. So understanding the location and angulation of maxillary impacted canine is important in the treatment plan for both oral surgeons and orthodontics for proper flap design and approach and orthodontic appliances and techniques. The aim of this study was to determine the prevalence of maxillary impacted canine and its classification among sample of Iraqi people.

Materials and Method

This retrospective study collected data from 1995 panoramic radiographs for patients aged 16-37 years old who had attend oral and maxillofacial radiology center in An-Najaf city. All the panoramic radiographs were examined for the presence of impacted maxillary canines that fails to erupt into oral cavity in the future. All the impacted maxillary canines were matched to the seven subtypes of Yamamoto et al [9] classification system according to the long axis angles and occlusal plane [figure 1]. The collected data were analyzed in relation to gender, side either unilateral or bilateral, right or left and classification.

Results

Among 1995 panoramic radiographs there were 737 (37%) males and 1258 (63%) were females, the patients diagnosed with impacted maxillary canines were 79 (3.95%) patients. Females represented the highest proportion of impaction 62 (4.9%) patients compared to males 17 (2.3%) [table 1]. Table 2 described the unilateral impaction (72%) was higher than bilateral impaction (28%) in both males and females. The highest impaction matched type II (53.46%) followed by type IV (27.22%), type I (17.82%), type III (0.99%) and there were no cases for type V,VI and VII in this sample. Also this study reported that the right side of maxilla was highly affected by impaction than the left side [table 3].

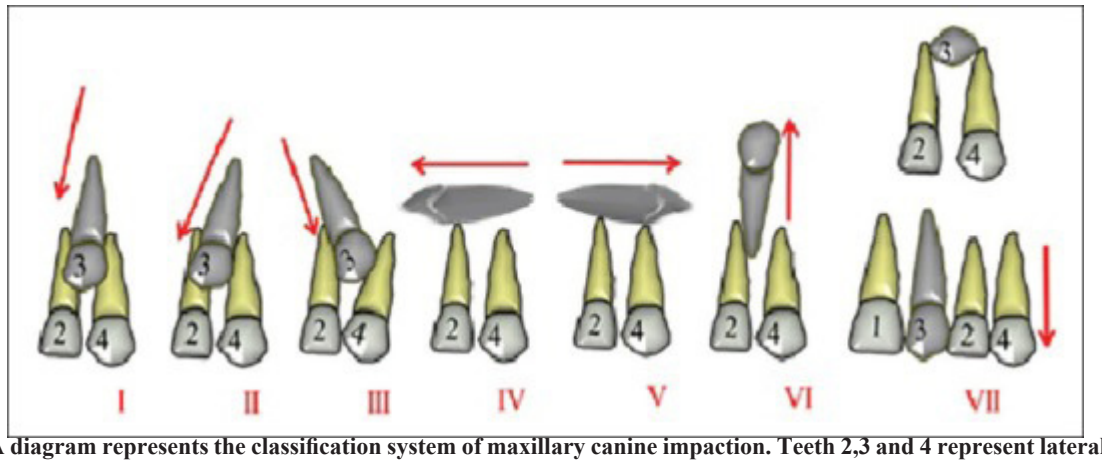

Figure 1. A diagram represents the classification system of maxillary canine impaction. Teeth 2,3 and 4 represent lateral incisor, canine and first premolar, respectivly.

Table 1. Number and percentage of male and female patients and canine impaction in each gender and among all the sample.

Gender	Criteria			Total
		No Impaction	Impaction	
Male	Count	720	17	737
	Percent %	97.69 %	2.3 %	100%
	Total %	36.09 %	0.85 %	36.94 %
Female	Count	1196	62	1258
	Percent %	95.07 %	4.92 %	100 %
	Total %	59.94 %	3.1 %	63.06 %
Total	Count	1916	79	1995
	Total %	96.05 %	3.95 %	100 %

Table 2. Number and percentage of canine impaction for both unilateral and bilateral sides of maxilla for each gender.

Gender	Criteria	Canine Impaction		Total
		Unilateral	Bilateral	
Male	Count	11	6	17
	Percent %	64.71 %	35.29 %	100%
	Total %	13.92 %	7.59 %	21.51 %
Female	Count	46	16	62
	Percent %	74.19 %	25.81 %	100%
	Total %	56.96 %	21.51 %	78.49 %
Total	Count	57	22	79
	Percent %	72.15 %	27.85 %	100%

Table 3. Number and percentage of types of maxillary canine impaction for each side for each gender

Gender	Criteria	Right Canine Impaction					Left Canine Impaction					Total
		I	II	III	IV	V,VI & VII	I	II	III	IV	V,VI & VII	
Male	Count	2	5	No	5	No	No	7	No	4	No	23
	Percent %	8.69	21.73	0	21.73	0	0	30.43	0	17.39	0	100%
	Total %	1.98	4.95	0	4.95	0	0	6.93	0	3.96	0	22.77
Female	Count	10	25	No	6	No	6	17	1	13	No	78
	Percent %	12.82	32.05	0	7.69	0	7.69	21.79	1.28	16.66	0	100%
	Total %	9.9	24.75	0	5.94	0	5.94	16.83	0.99	12.87	0	77.23
Total	Count	12	30	0	11	0	6	24	1	17	0	101
	Percent %	11.88	29.7	0	10.89	0	5.94	23.76	0.99	16.83	0	100%

Discussion

The current study had shown the prevalence of impacted maxillary canine of 3.9% that lied within the range of other studies that had shown as 0.27% among Japanese[4], 2.1% among Chinese[10], 2.4% among Italian[6],5.1% among Turkish[11], 5.4% among Hungarian[12] and 7.5% among Saudi population[5]. This variation in proportions indicated that the incidence of maxillary canine impaction varied among different ethnic populations. There are many factors contributing to the impaction of maxillary canine as late maxillary canine tooth germ development and its long path of eruption also the delay in its eruption accompanied by increasing bone density and pressure from surrounding bony cavities such as nasal and orbital cavities and maxillary sinus[13]. Although the first premolar tooth germ developed later than canine tooth germ, its eruption earlier than canine due to its short path of eruption in comparison to the long path of eruption of canine, so the space between lateral incisor that erupted earlier to them and first premolar must be maintained to facilitate eruption of canine[14]. The current study reported that 17 patients were men and 62 were women meaning that maxillary canine impaction was 3.6 times more in females than males, these finding were in agreement with other studies[15,16]. The difference between genders related to fact that the sizes of skull, maxilla and mandible are larger in males than in females so there will be adequate space for canine to erupt[14]. This study reported a unilateral impaction (72.15%) was more common than bilateral impaction (27.85%), this result was in agreement with other studies[5,16,17]. The current study reported a higher right side impaction than the left side impaction and this finding was confirmed by Altaee ZH study[18]. This study reported that type II canine impaction was more predominant followed by type IV, type I and type III respectively and it was in agreement with Hassan AL-Zoubi et al[16] study. Canines play an important role in both occlusal stability and aesthetics so giving a complete picture - for oral surgeons and orthodontics according to population - about their prevalence and type of impaction is essential for proper treatment plan.

Conclusions

The prevalence of impacted maxillary canine is 3.9 % among sample of Iraqi population. Females are more affected by impaction than males by 3.6 times. Unilateral impaction is more common than bilateral impaction, and the right side is more affected by impaction than the left side. Type II maxillary canine impaction represents the majority of impactions followed by type IV, I and III respectively.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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