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PREVALENCE OF CANINE IMPACTION IN A SELECTED SAMPLE OF SULAIMANI CITY POPULATION

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ABSTRACT

A tooth with delayed eruption or not exposing to erupt is called impacted tooth. Third molars, maxillary canines, maxillary and mandibular premolars, and maxillary central incisors are the teeth most frequently involved. The impacted tooth makes many problems to orthodontic treatment. When impacted canine is identified early, extraction of the deciduous canines may allow the impacted canines to correct their paths of eruption and erupt into the mouth in relatively good alignment.

Methodology: the panoramic radiographs of 1050 patients (441male and 609female) aged from 15 to 25 years, who attended the x-ray department of Shorish dental center for radiographic examination from 1st January 2014 to 1st Oct 2015. The data analysis was done by statistical software named SPSS version 17.

Result: A total of 1050 patients, 73 cases (6.95%) had impacted canines (27 males and 46 females). There was high significant relation ($P < 0.001$) of the prevalence of impacted canine and the dental arches; higher prevalence in the upper arch than the lower (6.29% vs. 0.66%).

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INTRODUCTION

Impacted teeth are those with a delayed eruption time or that are not expected to erupt completely based on clinical and radiographic assessment (Richardson and Russel, 2000). All teeth can be impacted, however, third molars, maxillary canines, maxillary and mandibular premolars, and maxillary central incisors are the teeth most frequently involved (Rajic, Muretic and Percac, 1996). Impacted teeth present many problems for the orthodontist. They can compromise tooth movement, esthetics, and functional outcomes (Cooke and Wang, 2006). The most common etiology for canine impaction are the local factors and the result of any one, or combination of the following factors: 1-tooth size-arch length discrepancies, 2-abnormal position of the tooth bud, 3-the presence of an alveolar cleft, 4-ankylosis, 5-prolonged retention or early loss of the deciduous canine, 6-associated cysts or tumors, 7-dilaceration of the root, 8-iatrogenic causes, and 9-idiopathic condition with no apparent etiology (Jacoby, 1983). Systemic factors such as genetic disorders, endocrine deficiencies, and previous irradiation of the jaws are also

associated with a failure of tooth eruption and impaction. In systemic conditions multiple teeth are usually impacted. In most cases, however, the specific cause of failure of eruption remains unknown (Fonseca, 2000) The different methods of diagnosis that may allow for early detection and prevention should include a family history, visual and tactile clinical examinations by the age of 9-10 years and a thorough radiographic assessment (Grace, 2000, Deepti, 2010 and Nagan, 1987). A large number of completely impacted teeth may be retained asymptomatic (Deepti, 2010). However, Bishara *et al.* suggested the following sequelae of canine impaction: (Bishara, 1976 and Bishara, 1992).

- Labial or lingual malpositioning of the impacted tooth
- Migration of the neighboring teeth and loss of arch length
- External root resorption of the impacted tooth as well as the neighboring teeth
- Infection particularly with partial eruption resulting in pain and trismus
- Referred pain

When the condition is identified early, extraction of the deciduous canines may, in specific cases, allow the impacted canines to correct their paths of eruption and erupt into the mouth in relatively good alignment. Clinical signs that may

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indicate ectopic or impacted cuspids include lack of a canine bulge in the buccal sulcus by the age of 10 years, over retained primary cuspids, delayed eruption of their permanent successor and asymmetry in the exfoliation and eruption of the right and left canines (Bishara, 1992). This interceptive treatment may further reduce complications associated with palatally impacted canines including root resorption of the lateral incisors and the need for more complex surgical and orthodontic intervention (Bjerklin, 1992)

MATERIALS AND METHODS

This study was a retrospective study based on the panoramic radiographs of 1050 patients (441 male and 609 female) aged from 15 to 25 years, who attended the x-ray department of Shorish dental center for radiographic examination from 1 January 2014 to 1 Oct 2015. Digital panoramic radiographs were taken with a Planmeca PM 2002 cc Proline set at 1.25 magnification. All digital radiographs were stored in a computer database using the manufacturer's software (Dimaxis Pro, version 4.0.5, Planmeca). The examiners considered the delayed eruption of the permanent canine or prolonged retention of the deciduous canine beyond 14–15 years of age as indicative clinical signs of canine impaction (Bishara, 1992 and Manne, 2012). After the examination of the patient records, patients who exhibited any pathological conditions, trauma, or fracture of the jaw that might have affected the normal growth of permanent dentition or any hereditary diseases or syndromes such as Down's syndrome or cleidocranial dysostosis and those with mixed dentition were excluded from the study. The numbers and locations (right/left, upper/lower) of impacted canine teeth, as well as patient sex, age, retained deciduous canines and any other associated pathologies, were noted. All radiographs were re-examined 2 weeks after the initial examination by two observers for the reliability of the results. The statistical analysis was done by a statistical software SPSS version 17.

RESULTS

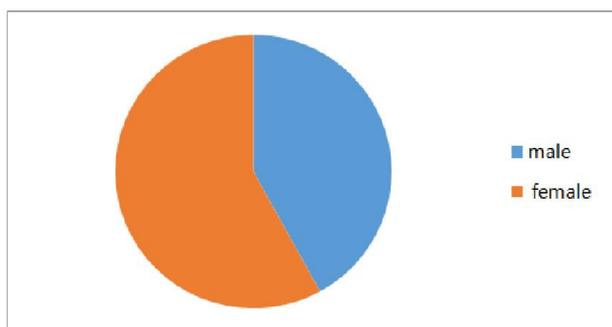


Figure 1. Showed the general distribution of the sample according to gender

Table 1. shows the general characteristics of the sample. A total of 1050 cases 73 cases (6.95%) had impacted canines. Out of 73 cases, 27 cases were males, and 46 cases were females

Gender	No impaction	Occurrence	Total
Male	414 (39.43%)	27 (2.57%)	441 (42%)
Female	653 (53.62%)	46 (4.38%)	609 (58%)
Total	977 (93.05)	73 (6.95%)	1050 (100%)

Table 1. Shows the general characteristics of the sample. A total of 1050 cases 73 cases (6.95%) had impacted canines. Out of 73 cases, 27 cases were males, and 46 cases were females. Table 2. Shows presence of impacted canine according to gender, pattern and site of the impaction. Prevalence was higher in females (4.3%) than males (2.57%) but this difference was not significant statistically. In regard to dental arch, prevalence of impacted canine was higher in the upper arch than the lower (6.29% vs. 0.66%) and this difference was statistically highly significant ($P < 0.001$). Impacted canine in unilaterally or bilaterally (6.2% vs. 0.77%) showed a highly significant statistical difference ($P < 0.001$), with higher prevalence unilaterally. Site of the impacted canines showed a statistical significant difference ($P < 0.05$) between right impacted and left impacted canines (2.66% vs. 4.29%).

Table 2. Presence of impacted canine in relation to gender, pattern and site of the impaction

Potential risk factor	impacted Number (%)	No impacted Number (%)	P value
Gender			
Male	27 (2.57)	414 (39.43)	$\chi^2 = 0.735$
Female	46 (4.38)	569 (53.62)	$P = 0.391$
Dental arch			
Upper	66 (6.29)	984 (93.71)	$\chi^2 = 49.4$
Lower	7 (0.66)	1043 (99.34)	$P = 0.0000$
Pattern			
Unilateral	65 (6.2)	985 (93.8)	$\chi^2 = 46.11$
Bilateral	8 (0.77)	1042 (99.23)	$P = 0.0000$
Site			
Right	28 (2.66)	1022 (97.34)	$\chi^2 = 4.1$
Left	45 (4.29)	1005 (95.71)	$P = 0.0428$

DISCUSSION

The permanent canines are the foundation of an esthetic smile and functional occlusion; it is an important tooth of the dentition because it is placed strategically in the mouth. It makes the transition between the anterior teeth (central and lateral incisors) and the posterior teeth which are the first and second premolars. This tooth has a very long root, the longest of all teeth, and therefore, its position is unique in the dental arch (Thilander and Jakobsson, 1968). The present data indicated that the prevalence of canine impaction was more than those reported in other studies. Our data has shown that the prevalence of canine impaction to be 6.95%, which is much higher than the range of 0.8% to 3.6% reported in other studies (Grover and Lorton, 1985; Aras, 2008; Aydin *et al.*, 2004; Mazinis *et al.*, 2012 and Javid, 1985). This may be due to the ethnic background of the sample that may result in higher or lower rates of some anomalies (Baccetti, 1998) some traits that may occur more commonly in certain ethnic groups may be considered specific to that population⁽²¹⁾.

Permanent maxillary canines are the second most frequently impacted teeth; the prevalence of their impaction is 1–2% in the general population. According to our data the prevalence of maxillary canine impaction was 6.29%. This is most likely due to an extended development period and the long, tortuous path of eruption before the canine emerges into full occlusion, (King *et al.*, 2008 and Rayne, 1969; Bass, 1967 and Hitchin, 1956) 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. Apart from the eruption process, the successful development of permanent canine involves the synchronized forward and lateral growth of the maxilla. As the eruption process is so complex, it is not surprising that problems may arise, which lead to complications including tooth retardation or failure of eruption (Adrian Becker, 1998; Becker, 1995). Canine impaction is more prevalent in the maxilla than the mandible. According to the literature, the Mandibular canine impaction is relatively rare (Becker, 1995; Aras, 2008; Aydin, 2004; Aktan *et al.*, 2010; Fardi, 2011; D'Amico *et al.*, 2003; Aydin, 2004; Alaejos-Algarra *et al.*, 1998; Camilleri, 2003; Rohrer, 1929) same as our findings. The dissimilarity between maxillary and mandibular canine impactions can be attributed to the fact that, maxillary canines is the last teeth to develop and travel a long path before eruption into the dental arch, thus increasing the potential for mechanical disturbances resulting in displacement and impaction (McSherry and Richardson, 1999).

According to our findings, the Prevalence of canine impaction was higher in females (4.3%) than males (2.57%) but this difference was not significant statistically, this result supports the same results with many previous researches which indicates that women are more likely to have impacted canines (Park, 2012; Nidhal *et al.*, 2013 and Zahrani, 1993). This difference could be explained by the fact that more female patients than male patients seek dental treatment, although there still remains no consensus on the domination of sex (Joshi, 1982). Also Peck (Peck, 1994), reported that gender difference attributed to biological phenomena with genetic links involving the sex chromosomes. According to the present study most of the patients (6.2%) had single impaction (0.77%) had bilateral canine impactions. In the other hand Ericson and Kurol (Peck, 1994), observed 8% of bilateral canine impactions. This different percentages may be due to the different sample size and different ethnics but they are in line in a fact that most of patients have a unilateral canine impaction if compared to those have bilateral canine impaction. The present results indicate that left canines were more impacted if compared with the right one (4.29% vs.2.66%), this finding agrees with other researchers who reported similar results (Syryńska *et al.*, 2008; Bahl, 2013; Tito, 2008 and Caovilla, 2005).

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