

## FREQUENCY OF IMPACTED CANINES IN ORTHODONTIC PATIENTS PRESENTING TO ARMED FORCES INSTITUTE OF DENTISTRY

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### ABSTRACT

**Objective:** The aim of our study was to observe the frequency of patients presenting with impacted canines in our subset of population.

**Study Design:** This is cross-sectional observational study.

**Place and Duration of Study:** The study was conducted in the Orthodontic Department at Armed forces Institute of Dentistry Rawalpindi.

**Patients and Methods:** Orthopantomographs (OPGs) of 1956 consecutive patients were observed for impacted canines. Thirty two patients were excluded for various reasons. Age and gender was recorded Orthopetomographs (OPGs) and intra-oral photographs were observed to detect the impaction of canines.

**Results:** Out of 1924 orthodontic patients (64) 3.33% were found to have impacted canines. The mean age of the patients presenting with impactions was 18.3 years. The male to female ratio was 1:2. The 87.5 % of the impactions were unilateral. Single tooth impactions were the most common followed by two or three impactions in the same patient. The most frequently impacted tooth in 51.56% of the cases was the right maxillary cuspid. The least common was the right mandibular cuspid, 4.7%.

**Conclusion:** A frequency higher than the previously quoted prevalence was found in our study. Racial and ethnic factors may have a role, further large scale studies are required to validate this assumption.

**Keywords:** Impacted canines, frequency, maxillary cuspids, mandibular canines.

### INTRODUCTION

Impacted teeth are those with a delayed eruption time or that which are prevented from eruption into their normal functional positions because of malposition, lack of space or some other barriers and are not expected to erupt completely based on clinical and radiographic assessment [1]. The maxillary canine is the second most frequent tooth to be impacted after the third molars [2]. The prevalence of impacted canines in the general population is 1-2.2% and only one study reports it to be as high as 3.85% [3]. A total of 70-85% of these are located palatal to the dental arch [4, 5]. Females tend to be affected by this condition twice as frequently as males [6, 7]. The etiology is multi-factorial and includes, extended development time, long path of eruption, and late sequence of eruption than any other tooth in the anterior

maxillary region [8-10]. Furthermore palatal and buccal impactions are considered to be two entirely different entities with different etiologies, where lack of space accounts for buccal impaction and excess space is held responsible for palatal impactions, this is supported by the finding that 85% of palatal impactions had sufficient space in the arch to erupt [11]. Authors explain this phenomenon by assuming the canine has sufficient space to move from a more buccal to palatal position rendering it impacted [12].

Some incriminated the congenital absence, or presence of aberrant lateral incisor in the impaction of maxillary cuspids [13] whereas others still, blamed arch width deficiency [14].

Mandibular canine impaction is far rare and only a few studies have been carried out revealing its frequency [3]. Data from various

studies depicts, however an occurrence of 0.07-1.29% most of which are located labially [15].

The management of impacted canines, orthodontically is a daunting task for most clinicians and knowledge of the extent of this problem in our society is as important as finding a solution. Since prevalence and frequency of impacted canines is variable for different races, it is important to determine the extent of this condition in our subset of population. Therefore this study was conducted to determine the frequency of impacted maxillary and mandibular canines in a subset of our population.

**PATIENTS AND METHODS**

The study was conducted in the Orthodontic department of Armed Forces Institute of Dentistry, Rawalpindi. A total of 1956 consecutive orthodontic patients presenting between June 2001 and April 2008 were included in the study.

**Inclusion criteria**

All orthodontic patients in their permanent dentition with complete canine root development were included in the study. Adequate dental records and histories were considered mandatory for inclusion.

**Exclusion criteria**

Patients in their mixed dentition were excluded from the study as by definition a tooth is labeled impacted only if it fails to erupt after the designated root development. Patients with craniofacial syndromes were also excluded as were patients with unsatisfactory histories or records.

Orthopantomographs (OPGs) and intra-oral photographs were observed to detect the impaction of canines. Examination history sheets taken at their first appointment were also consulted.

The OPGs were taken on the Siemens Cephalostat and examined on a viewer by a

single observer (A.A) under adequate magnification where required.

Radiographs were observed for impacted canines, the quadrant they were in and multiple impactions in a single patient if present.

Gender and age distribution was also observed.

**Statistical Analysis**

Data had been analyzed using SPSS version 15.0 descriptive statistics were used to describe the data.

**RESULTS**

Out of a total of 1956 patients 9 were excluded because they had unsatisfactory records and 23 were excluded because they were in their mixed dentition, therefore the total number of patients were 1924.

Sixty fore (3.33) patients found to have one or more impacted canine in any quadrant. The mean age of the patients presenting with impacted canines was 18.375 years (SD=8.5).

Female patients were 67.18% and 32.81% male, leading to a male to female ratio of 1:2.

Single tooth impactions were the most frequent 84.4%, two canines were impacted in 12.5% cases, three were impacted in 1.5% cases and all four canines were also impacted in 1.6% of the cases.

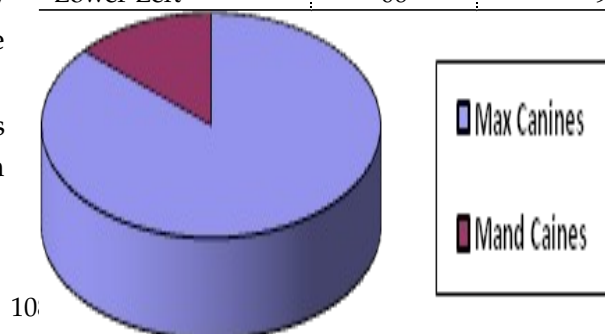
Bilateral maxillary canines were impacted in 12.5% of the cases whereas 87.5%

12.3  
-

87.67%

**Table: Frequency of impact of individual teeth (n=64)**

	Frequency	%
Upper right	33	51.56
Upper Left	30	46.87
Lower right	03	4.7
Lower Left	06	9.4



**Figure: Maxillary Vs Mandibular impactions**

were unilateral. Mandibular bilateral impactions were found in only 12.5% of lower impactions.

A total of 64 canines were impacted, 87.67% of which were maxillary and 12.32% were mandibular (Figure). Mandibular canines were found impacted in 0.42% patients from the total sample. The tooth found impacted in most of the patients was the maxillary right cuspid, 33 (51.56%), followed by the left maxillary cuspid, 30 (46.87) the left mandibular canine, 6(9.4%), the least impacted was the right mandibular canine which was found impacted in only 3 (4.7%) of the cases (Table).

## DISCUSSION

The frequency of impacted canines in our study was 3.33%, higher than most other studies quoted so far [16]. A higher ratio could be attributed to the fact that our study sample comprised of orthodontic patients rather than general population. Racial factors and familial trends also govern the prevalence of canine impaction [17, 18], and could be contributory to the disparity between results.

The gender predisposition in our study was comparable to most other studies [6, 7] where females were found affected twice as often as males. There is still some controversy over the reason behind this trend.

Occurrence of bilateral impactions is variable and most studies show that maxillary canines are affected bilaterally in 8-10% of impactions [19]. Our study revealed that 12.5% of maxillary impactions were bilateral.

Maxillary impactions are believed to occur 10-20 times more frequently than mandibular [17, 18]. In our subset of population maxillary impactions were 7 times more frequent than maxillary. This is depicted by the fact mandibular impactions occurred with a frequency of 0.42% where the

range in other studies varies from 0.07-1.29% [17].

Frequency of individual tooth impactions in our study revealed that the right maxillary cuspid was impacted the most followed by the left maxillary cuspid. We found no quotable studies that compared the occurrence of impactions between two sides of the same arch. Through the difference was small but mandibular left canines were found impacted more frequently.

Impactions if, unresolved may increase the risk of infection and cystic follicular lesions and compromise the lifespan of neighbouring lateral incisors due to root resorption. Clinical studies have determined that 12% of lateral incisors that are adjacent to ectopically erupted canines have some degree of external root resorption, while the prevalence of lateral incisor root resorption in 10-13 year olds is 0.7% [20].

A few factors related to impacted canines were not discussed in this study. There is an association between the presence of peg shaped maxillary lateral incisors and impaction of maxillary canines [12].

We did not focus on this factor. Furthermore we did not observe other pathological problems that impactions could be a cause of for instance, cystic change, pressure resorption or mobility of adjacent teeth adjacent teeth.

## CONCLUSION

1. A higher frequency of impacted maxillary and mandibular canines was observed in our subset of population.
2. Maxillary canines were impacted 7 times more frequently than mandibular.
3. Right sides canines were impacted more frequently in the maxilla and the converse was found true for the mandible.

## REFERENCES

1. Thilander B, Jakobsson SO. Local factors in impaction of maxillary canines. *Acta Odontol Scand* 1968; 26:145-68.
2. Shah RM, Boyd MA, Vakil TF. Studies of permanent tooth anomalies in 7886 Canadian individuals. *J Can Dent Assoc.*1978; 44: 262-4
3. Aydin U, Yilmaz HH, Yildirim D. Incidence of canine impaction and transmigration in a patient population. *Dentomaxillofac Radiol* 2004; 33, 164-69.
4. Thilander B, Myrberg N. The prevalence of malocclusion in Swedish school children. *Scand J Dent Res*1973;81:12-20
5. Nordenram A, Stromberg C. Positional variation of impacted upper canine. *Oral Surg Oral Med Oral Pathol.*1966; 22: 711-4
6. Bishara SE. Impacted maxillary canines: a review. *Am J Orthod Dentofacial Orthop* 1992; 101:159-71.
7. Becktor KB, Steiniche K, Kjaer I. Association between ectopic maxillary canines and first molars. *Eur J Orthod* 2006; 27: 186-9.
8. Rayne J. The unerupted maxillary canine. *Dent Pract Dent Rec* 1969; 19:194-204.
9. Bass TB. Observations on the misplaced upper canine tooth. *Dent Pract Dent Rec* 1967; 18:25-33.
10. Hitchin AD. The impacted maxillary canine. *Br Dent J* 1956; 100:1-14.
11. Jacoby H. The etiology of maxillary canine impactions. *American J Orthod.*1983; 84: 125-32
12. Al-Nimri K , Gharaibeh T. Space conditions and dental and occlusal features in patients with palatally impacted maxillary canines: an aetiological study. *Eur J Orthod.*2005; 27: 461-5.
13. Becker A, Sharibi s, Chaushu S. Maxillary tooth size variation in dentitions with palatal canine impaction. *Eur J Orthod* 2002; 24: 313-8.
14. Langberg B J, Peck S. Tooth-size reduction associated with occurrence of palatal displacement of canines. *Angle Orthod*;2000; 70: 126-8
15. Fonseca JR. *Oral and Maxillofacial Surgery*. Philadelphia: W. B. Saunders, 2000: Vol. 1:342-71.
16. Dachi SE, Howell FV. A survey of 3,874 routine full mouth radiographs. *Oral Surg Oral Med Oral Pathol.* 1961; 14: 1165-9.
17. Camilleri S, Scerri E. Transmigration of mandibular canines-A review of the literature and a report of five cases. *Angle Orthod* 2003; 73:753-62.
18. Kuftinec MM, Stom D, Shapira Y. The impacted maxillary canine: I. Review of concepts. *ASDC J Dent Child.* 1995; 62(5):317-24.
19. Mulick JF. James F. Mulick on impacted canines. *J Clin Orthod.*1979; 13: 824-34.
20. Power SM, Short MB. An investigation into the response of palatally displaced canines to the removal of deciduous canines and an assessment of factors contributing to favourable eruption. *Br J Orthod* 1993; 20:217-23.

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