FREQUENCY OF ECTOPIC CANINES — A STUDY

[1]AMIR KHAN, BDS, FCPS II Trainee
[2]HAMEED ULLAH JAN MARWAT, BDS, MCPS, FCPS (Pak), OJT (USA)
[3]SUNDAS ALI, BDS, FCPS II Trainee
[3]FAIZA MALIK, BDS, FCPS II Trainee
[4]SADIA NAUREEN, BDS, FCPS-II
[3]MUHAMMAD ARIF MAHMOOD, BDS, MCPS Trainee

ABSTRACT

The purpose of this study was to assess the frequency of ectopic canines in patients' reporting to the 28 Military Dental Centre Lahore Cantt, seeking orthodontic treatment during the last twelve months. A total of 173 patients were evaluated. Out of which 41(24%) patients (11 were males and 30 were females) with an approximate male to female ratio of 1:3. Most frequent location was labial, 38 out of 41(93%).

Key words: *Ectopic canines, impaction, patients, orthodontics, MDC.*

INTRODUCTION

Ectopic teeth or simply dental ectopia, as it is self evident from its name, is a condition whereby a tooth is erupted and positioned in a location which was not destined for that. This abnormal location of the tooth has great detrimental effects not only on the teeth, periodontal health but it also compromises pro-per function and at times esthetic level of the patient. An ectopic tooth may be fully erupted, impacted or even transposed with the neighboring tooth. If impacted it may cause root resorption of the abutted tooth.

Maxillary canine is second only to the mandibular third molar in its frequency of impaction. Its prevalence is about 1.5%. It is observe that canine becomes ectopic more often palatally than labially with over double the frequency. Its frequency varies from less than 0.8% to 2.8%. The condition is more than twice as common in girls as in boys. Canine impaction is found palatal to the arch in 85 percent of the cases and labial in 15 percent of the patients. There is some evidence that patients with class II division-Z malocclusions and dental hypo or aplasia, may be at a higher risk to the development of an ectopic canine.[1-3]

Various myths have been associated with the causes of ectopic or impaction of teeth. The exact etiology of the palatal ectopic canine remains obscure but is likely to be polygenic and multifactorial. In case of ectopic maxillary canines, cause has been suggested to be genetic, as it is associated with incisor-premolar hypodontia as well as with various other anomalies. It has also been claimed that there is some autosomal dominant transmission.[4,5]

There is substantial evidence of palatally ectopic canines that they occur more often among family members. They may be linked with missing or peg lateral incisors, an absence of crowding, and late developing dentitions.[6,7]

Management of ectopic canines often pose challenging situation to the general dental practitioners. Instead of conservative approach, this tooth is most commonly extracted in Pakistan, particularly for esthetic reasons in a female when she is close to her marital life. The same is the situation in other developing countries. If finances permit, orthodontic consultation and management will be a prudent and wise decision, so as to maximize benefit to the patient.

[1]28 MDC Lahore Cantt.
[2]28 MDC Lahore Cantt. E-mail: huj100@hotmail.com
[3]28 MDC Lahore Cantt.
[4]Resident Orthodontics, Islamabad

Mismanagement and failures in diagnosis may be costly in terms of clinical time both for the practitioner and patient alike. Chances of professional risk to litigation will be on the rise if a serious damage is caused to the adjacent teeth with out being noticed by the patient and/or not being addressed by the family professional.[8]

Orthodontic treatment of cases in which an ectopically positioned maxillary canine is complicated by associated resorption of an incisor root varies according to various factors as the position of the canine, lack of space and guidance, developmental stages of neighboring teeth, and site and severity of the root resorption. The most common approach is surgical exposure of the impacted canine and orthodontic repositioning, sometimes in combination with extraction of premolars. The question arises as to whether in the long term the root resorption progresses, ceases, or undergoes cemental repair.[9] If the lesion is still active, it has to be monitored and controlled as quickly as possible.

To minimize incidence of dental ectopia, all preventive and interceptive measures are to be adapted at all levels by those who are immediately concerned and professionally responsible. Majority of normally erupting maxillary canines should be palpable in the labial sulcus by ten to eleven years of age. Those maxillary canines erupting after approximately 12.3 years in girls and 13.1 in boys may be considered delayed. During routine dental or orthodontic consultation, all future dentofacial problems are to be timely envisioned, analyzed, conveyed to the patient and parents and then managed on prioritized basis, through a prudent and customized treatment plan as timely as possible. This strategized protocol will effectively help in combating the inevitable devastating situation which was bound to impact the overall physicomental and psychosocial health and wellbeing of the patient.[10,11]

METHODOLOGY

This study was conducted in the department of orthodontics, 28 Military Dental Centre (MDC), the oldest dental centre in the country, which is located in a tertiary care teaching hospital, CMH Lahore. Final screened sample comprised of 173 patients, of both genders. The idea was to determine the frequency of ectopic canines in this diversified sample of patients, who reported to this centre during the last 12 months time period, which spanned from May 2009 to May 2010.

All the patients were in permanent dentition stage, with complete adequate dental records were included in the study. The dental casts and photographs of the patients were assessed by a single technical operator (A.K). Sample comprised of males and females. Female were more, as is commonly anticipated in orthodontics, probably because of their great esthetic concern. Gender distribution, mean age and position of the ectopic canines were evaluated.

All patients suffering from complete anodontia, patients impacted with syndromes or having sever dentofacial anomalies, children suffering from rampant caries, patients having primary teeth only, patients with poor orthodontic record, and smokers were excluded from the study.

The inclusion criteria was; patients willing for orthodontic treatment, all patients in the permanent dentitions patients with no history of dental extraction, patients well motivated to act as an active participant in research and other study projects and all patients who showed reasonably good dental and periodontal health.

RESULTS

A total sample size of 173 patients, comprising of either gender and diversified ages, was evaluated, out of which only 41 (24%) patients were found to have ectopic canines. (Fig 1)

The mean age of the patients was 14.46 years, with the mean age of males being 15.27 years and that of the females was 14.16 years. (Table 1)

Out of the 41 (24%) patients having ectopic canines, 11 were males and 30 were females, with an approx. male to female ratio of 1:3 (Fig 2)

The spatial location of the ectopic canines was also assessed. Most frequent was the buccal/labial ectopic eruption, 38 out of 41 (93%), followed by palatal impaction, 2, (5%) and the lingually blocked out ectopic canines, 1 (2%). The frequency of canines in relation to their site of eruption is shown in Fig 3.

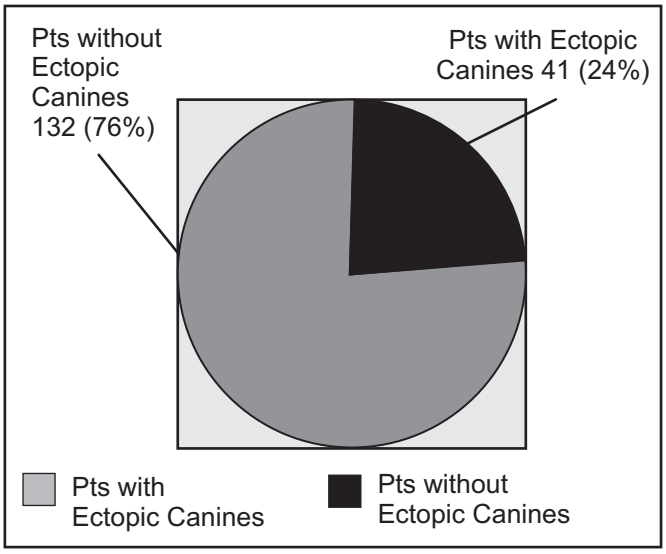

Fig. 1: Patients with ectopic canines

TABLE 1: MEAN AGES OF THE PATIENTS

Mean Age	14.46 years
Males	15.27 years
Females	14.16 years

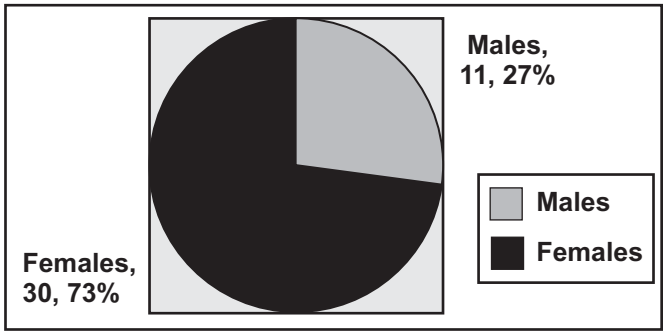

Fig 2: Gender frequency of resorption

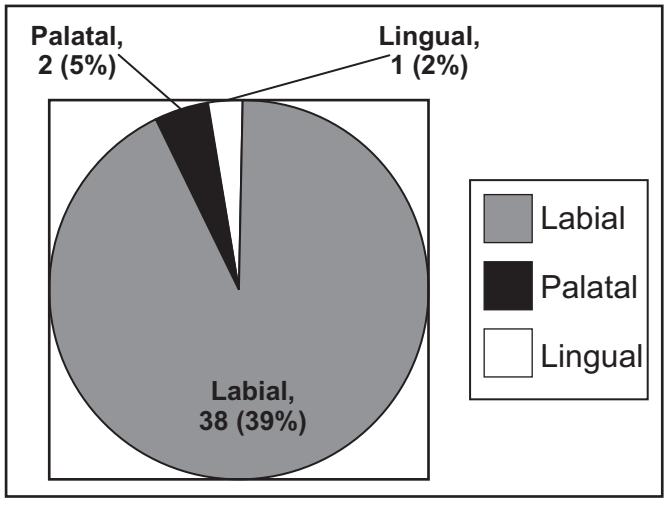

Fig 3: Ectopic eruption sites

DISCUSSION

Early detection of ectopic canine and/or its impaction, diagnosis and assessment of the extent of resorption of the neighboring teeth, is of fundamental importance for prevention or early intervention to reduce the subsequent complications.[12-14]

In maxillary canine mal positioning, site specific tooth agenesis also called hypodontia and/or transposition have been associated in various studies, although not focused on in our MDC study sample, carries great orthodontic leverage in dentistry. The canine aberration has been claimed to occur far more frequently on the side of the diminutive lateral incisor. A study conducted on two samples of nonsyndromic subjects possessing either maxillary canine-first premolar transposition (Mx.C.Pl; N=43, M9:F34) or palatal displacement of the maxillary canine (PDC; N=58, M21:F37). Agenesis of permanent teeth was identified by a radiograph. Significantly high tooth-agenesis frequencies were noted in both samples.[15]

Statistically significant differences between the MX.C.Pl and PDC samples were found in locations of tooth agenesis, indicating site-specificity of tooth agenesis associated with these canine malpositions. In Mx.C.Pl, agenesis of third molars (M3) occurred at a near-normal rate (19%) while maxillary lateral incisor (12) agenesis showed a thirteen-fold increase (26%). In PDC, the prevalence rate for associated M3 agenesis was 40%, twice the normal rate, while 12 agenesis was 3%. These new findings provide us food for thought and warrant a hypothesis of anteroposterior site-specific shift in the occurrence of tooth agenesis, associated genetically or epigenetically with distinct anomalies of maxillary canine position. These type of linkages have been found in Pakistani patients but so far no one has scientifically accepted and unraveled this challenge, but hopefully this segment will not be passed unnoticed by our professionals in their prospective research program conducted on our local population.[15]

In this study sample although no major consequences of ectopic teeth particularly associated with the maxillary canines were noted, although a long discharging sinus tract connected to right maxillary third molar ectopically located in paraorbital region and creating havoc for the patient was diagnosed and managed by the surgeon, stationed in CMH Rawalpindi.

There are however, bizarre reports of ectopic maxillary canines which are occluding or distorting the tract of nasolacrimal duct (NLDO) leading to serious ophthalmic problems. Two cases from the Bascom Palmer Eye Institute, University of Miami School of Medicine, Florida, USA, were diagnosed with this type of squeal, obstruction of duct (NLDO), due to maxillary canine ectopia. Only two interventional case reports were focused on and addressed. A 3-year-old girl who complained of epiphora and recurrent dacryocystitis of the right eye. Previous medical and surgical management was unsuccessful. Another 32 year-old female, quoted with a long history of right eye discomfort and epiphora. Previous examinations and workup were traced negative.[16]

As per the researcher record, a computed tomographic (CT) scan of the orbits and sinuses was performed in both patients. The ectopic teeth were surgically removed. Nasolacrimal system function and response to treatment at the last follow-up were recorded. In the first patient, CT imaging disclosed two teeth within the right inferior meatus compressing the nasolacrimal duct. In the second patient, CT revealed a large dental structure in the maxillary sinus compressing the nasolacrimal duct.[16]

Endoscopic tooth extraction and nasolacrimal duct probing in the first patient and surgical removal of the dental structure in the second patient effected complete resolution of symptoms. Both patients were symptom free at last follow-up. These cases suggest that ectopic eruption of teeth should be added to the differential diagnosis of NLDO. Surgical removal of the ectopic teeth compressing the nasolacrimal duct results in resolution of the lacrimal drainage obstruction. This revealed that the deleterious effects of ectopic teeth should never be under estimated.[16]

Some time we also come across maxillary incisor root resorption related to the presence of ectopic canine. Usually resorption is three times more in girls than in boys, which might be due to genetic make up. The resorption tend to be extensive, in some teeth only pulpal tissue is involved while in others, middle or apical 1/3rd of the root is under attack. Despite the extensive nature of the involvement there, only few clinical signs and symptoms are usually reported by the patients. This problem is often diagnosed late both in relation to the patient's age and the extent of resorption present. It is suggested that the problem should never be underestimated by dental practitioners; otherwise dental loss on part of the patient and above all vulnerability of the dental professionals to litigations will be exponentially increased.

Normally, the potentially resorption cases are those in which the canine cusp in periapical film is positioned medially to the midline of the lateral incisor. Such situations should be carefully investigated, if necessary. The risk of resorption also will increase with a more mesial horizontal path of eruption.[17]

Luckily no case of resorption was noticed in this study, inspite of quite a big size of a sample of 173 patients with 24% frequency of canine ectopia. Both overt and incipient resorption, if there, would have become definitely appeared, both clinically and radiographically, in our patients lot, of either of the gender, at this mean age of 14.46 years, where canine roots are fully formed and eruptive forces are completely over. It is again emphasized that although our female gender, in concord to international studies, showed approximately three times more dental ectopia (73%) than boys (27 %), but even then no apparent aftermath was detected. Findings regarding spatial location or the site of eruption of ectopic canines come out with diversified results. In present study, the most common site was the buccal/labial ectopic eruption, 38 out of 41 (93%), followed by palatal impaction, 2, (5%) and the lingually erupted aberrant canines, 1 (2%).

CONCLUSION

Ectopic eruption should not be underestimated by our dental professionals at any cost, as it can impact and undermine not only the health and integrity of neighboring dentitions but can also create havoc for smooth functioning of the other vital structures located in the closer vicinity of this tooth. Its aberrant position at times acts as a stumbling block for other entities and may completely choke the biological system.

From 10 years of age or younger, biannual intraoral examination by palpation of the canine eruption path is recommended. This clinical examination should be supplemented with a stepwise serially extended radiographic procedure in cases in which ectopic eruption of the maxillary canines is suspected.

Time bound detection of malposed canine, its effective diagnosis and assessment of the extent of resorption of the neighboring teeth, is of fundamental importance for prevention and/or early intervention to control the subsequent and looming complications.

ACKNOWLEDGEMENT

I acknowledge the zeal and enthusiasm shown, regarding sorting and collection of this data, by my devoted staff, Sep Muhammad Ashraf, DT, and Mr Usman Nasir, DSA, under the dynamic supervision of my FCPS resident Dr Amir Khan. My thanks are also due to my daughters, Ms Kaukab Hameed, an apprentice of psychology and Ms Saadia Hameed, a neophyte of genetics, for their true technical help in the completion of this study project.

REFERENCES

1 Hameed Ullah Jan, Ayesha Anwar, Sadia Naureen. Frequency of Impacted canines in orthodontic patients presenting to Armed Forces Institute of Dentistry. *Pak Armed Forces Med J 2009;* 59(3):363-66

2 Rozina Nazir, Erum Amin, Hameed Ullah Jan. Prevalence of impacted and ectopic teeth in patients seen in a tertiary care centre. Pakistan oral & Dental Journal 2009; 29 (2): 297-300.

3 Ericson S, Kurol J. Radiographic examination of ectopically erupting maxillary canines. *American Journal of Orthodontics and Dentofacial Orthopaedics* 1987; 91: 483-92.

4 The Maxillary ectopic canine: A review. Patrick. M McSherry, British Journal of Orthodontics, Vo1.25/1998/ 209-16.

5 Peck S, Peck L, Kataja M. The palatally displaced canine as a dental anomaly of genetic origin. Angle Orthodontist 1994; 64: 249-56.

6 Peck S, Peck L, Kataja M. Concomitant occurrence of canine malposition and tooth agenesis: Evidence of orofacial genetic fields. American Journal of Orthodontics and Dentofacial Orthopaedics 2002; 122: 657-60.

7 Zilberman Y, Cohen, Becker A. Familial trends in palatal canines, anomalous lateral incisors and related phenomena. European Journal of Orthodontics 1990; 12: 135-39.

8 Brin I, Becker A, Shalhav M. Position of the maxillary permanent canine in relation to anomalous or missing lateral incisors: A population study. European Journal of Orthodontics1986; 8: 12-16.

9 Becker, A., A. Shteyer , and J. Lustman . Surgical exposure of impacted teeth. In: Becker A, ed. *The Orthodontic Treatment of Impacted Teeth.* London, UK: Martin Dunitz Ltd; 1998: 26-35.

10 Chausu S, Sharabi S, Becker A. Dental morphologic characteristics of normal versus delayed developing dentitions with palatally displaced canines. *American Journal of Orthodontics and Dentofacial Orthopaedics* 2002; 121: 339-46.

11 Ericson S, Kurol J. Longitudinal study and analysis of clinical supervision of maxillary canine eruption. *Community Dentistry and Oral Epidemiology* 1986; **14:** 172-76.

12 Hurme V. Ranges of normality in the eruption of permanent teeth. *Journal of Dentistry for Children* 1949; 16: 11-15.

13 Ericson, S. and J. Kurol. Radiographic examination of ectopically erupting maxillary canines. Am J Orthod Dentofacial Orthop 1987. 91:483-92.

14 Ericson, S. and J. Kurol . Early treatment of palatally erupting maxillary canines by extraction of the primary canines. Eur J Orthod 1988. 10: 283-95.

15 Speck, L peck, M kataja, Site-specificity of tooth agenesis in subjects with maxillary canine malpositions. Angle orthod.1996; 66 (6): 473-76.

16 Alexandrakis, A R Hubbell, P A Aitken. Nasolacrimal duct obstruction secondary to ectopic teeth. Ophthalmology. 2000; 107 (1): 189-92.

17 S. Ericson, J Kurol. Resorption of maxillary lateral incisor caused by ectopic eruption of the canines. Am J Orhtod Dentofacial Orhtop. 1988; 94 (6): 503-13.