Prevalence of Impacted Maxillary Canines in Patients Attending Out Patient Department of Sri Siddhartha Dental College and Hospital of Sri Siddhartha University, Tumkur, Karnataka.

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Abstract:
The objective of the present study was to determine the prevalence of impacted maxillary canine in patients visiting out patient department of Sri Siddhartha dental college and hospital. This study comprises data from 14069 patients who attended the O.P.D. of Sri Siddhartha Dental College & Hospital of the Sri Siddhartha University, Tumkur, Karnataka between Jan 2009 to Dec 2009. Patients were examined in order to detect the impacted maxillary canines by intraoral examination, palpation, dental records and followed by radiographs. It was found that the prevalence of canine impaction was 2.6 % in males and 3.6 % in females suggesting that prevalence of impacted maxillary canines is more in females than males and it is statistically significant. The overall prevalence for maxillary impacted canines was found to be 3 % which suggested that it is much higher than previous studies. The results of this study were slightly different than other studies, while the dissimilarities may be attributed to the sample selection, method of the study and area of patient selection, which suggest racial and genetic differences.

Keywords: Impacted canines, prevalence, Clark’s rule, panoramic radiography.
Introduction:

The 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\textsuperscript{1}. 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\textsuperscript{2,3}. Failure of the eruption of permanent maxillary canine is a common dental anomaly. The most common causes for canine impactions are usually localized and are the result of any one, or combination of the following factors: (a) tooth size-arch length discrepancies, (b) prolonged retention or early loss of the deciduous canine, (c) abnormal position of the tooth bud, (d) the presence of an alveolar cleft, (e) ankylosis, (f) cystic or neoplastic formation, (g) dilaceration of the root, (h) iatrogenic origin and (i) idiopathic condition with no apparent cause\textsuperscript{2,3,4}.

The prevalence of impacted maxillary canine in different populations and ethnic groups has been the subject of several studies\textsuperscript{1,2,5,6}. The prevalence of impacted maxillary canine has been reported to vary between 0.2 to 2\%\textsuperscript{1-6}. The present study was performed to determine the prevalence of impacted maxillary canine in patients visiting outpatient department of Sri Siddhartha dental college and hospital.

Materials and methods:

This study comprised data from 14069 patients who attended the O.P.D. of Sri Siddhartha Dental College & Hospital of the Sri
Siddhartha University, Tumkur, Karnataka, between Jan 2009 to Dec 2009 out of which 7791 were males and 6278 were females. Patients were examined in order to detect the impacted maxillary canines by intraoral examination, palpation, dental records and followed by radiographs.

All radiographs were examined carefully by a single skilled dentist on a transparency projector under constant lighting conditions. A tooth that was prevented from erupting by a physical barrier was defined as an impacted tooth. Taking into account the mean eruption time, canines were considered as impacted when they remained in the jaw minimum two years after the respective mean age of tooth eruption. For the purpose of this study the cases of age more than 15 years were considered and were defined in groups according to the gender. Whenever Ericson’s criteria for palpation was breached, radiographs were advised.

For each case thorough clinical examination was done by conventional methods like inspection and palpation to find out any retained deciduous canine, bulge of canine, splaying of lateral incisors, lost space, crowding or fibrous tissue overlying canine region. Cases in which conventional examination methods revealed that the maxillary canine was impacted and if the patient was ready for the orthodontic treatment then radiographs were advised which helped in determining the type of impaction i.e. palatal or labial and whether it was favorable or non-favorable. Radiographs such as intraoral periapical radiographs which follow the Clark’s rule and panoramic radiographs or dental CT scans were advised. The mandibular canine is much less of a concern because it is almost 10 times less frequently impacted. After the examination of the patient records,
patients who exhibited one or more of the following pathological situations were excluded from the study:

- Any disease, trauma or fracture of the jaw that might have affected the normal growth of permanent dentition.
- Any hereditary diseases or syndromes such as Down’s syndrome or cleidocranial dysostosis.

Data was gathered and analyzed using the SPSS statistical package (version 12 software). The differences between the groups were tested using the Chi-square test, and Mann Whitney test.

**Results:**

Of the 14069 patients, 7791 were males (55.38%) and 6278 were females (44.62%); the mean age was 24 ± 15.71 years, ranging from 15 to 62 years. A total of 195 impacted maxillary canines were found in 170 males and 221 were in 168 females. The prevalence of canine impaction was 2.6 % in males and 3.6 % in females suggesting that prevalence of impacted maxillary canines is more in females than males and ‘p’ value suggested that it is statistically significant, which is shown in table 1 and fig 1. The prevalence for maxillary impacted canines in all the cases was found to be 3 % which suggest that it is much higher than previous studies.

**Discussion:**

The present data indicated that the prevalence of maxillary canine impaction in cases visiting to Sri Siddhartha Dental College was more than those reported in other studies. Our data has shown that the prevalence of maxillary canine impaction to be 3%, which is much higher than the range of 0.2% to 2% reported in other studies. The incidence of impacted upper permanent canines within the general population is approximately 1.5 – 2 % with up to 85 % of these being palatal impactions²,⁵.
Ericson in his study has found that the rate of impacted maxillary canines was in the range of 0.9 - 2 %\textsuperscript{6}. One more study by Stewart showed that the prevalence of impacted canine was in the range of 1-3 %, and it was also found that impaction of maxillary canines have 10 times more prevalence than the mandibular canines\textsuperscript{9}.

In any population, the prevalence of impacted maxillary canines is low, but it seems to have a variable distribution with regard to ethnic origin. The lowest frequency reported in the literature relates to the Japanese, where the anomaly occurred in only 0.27% of the sample population\textsuperscript{2}. A study of a large series of full mouth dental radiographs among patients in the USA revealed a figure of 0.92 %\textsuperscript{2}. While Brin et al in a study of an Israeli population, found a level of 1.5 %\textsuperscript{2}. The highest figure for the anomaly found is 1.8%, which has been reported in the study of an Icelandic population\textsuperscript{2}.

A strong prevalence of impacted canines is found among females, with a ratio of 2.3:1 \textsuperscript{2} in the group of American patients, 2.5:1 \textsuperscript{2,3,10} in an Israeli orthodontic group, and 3: 1 in both a Welsh orthodontic group\textsuperscript{2} and in a US orthodontic sample\textsuperscript{2}. Also it was 2.4:1 in Greek population as per Anastasia Fardi’s observations and in the same study the impacted canine prevalence was also found to be increased\textsuperscript{1}. However, a random Israeli population study has shown an approximately equal male-female occurrence of the anomaly\textsuperscript{11}.

To compare the prevalence found in this study with the different frequencies reported in the dental literature from other studied populations, one should consider the methodology used for detection of impacted maxillary canines as well as the clinical differences of the epidemiological studies, including sample selection, definition of impacted tooth and the age range of subjects. It is not
Prevalence of Impacted Maxillary Canines

To determine the actual prevalence of tooth impaction, a representative and randomized sample of the general population is required. Undoubtedly, it is not straightforward to collect such information, as exposing patients to radiation for research purposes conflicts with medical ethics. The most common practical approach is to examine radiographs from specific populations, which will inevitably involve the risk of bias in the data analysis.

Taking into account the source of the analyzed data, which were derived from our study, the large age range of the examined sample and the limited exclusion criteria, one might consider that the results of this study are not representative of the general population. However, the primary aim of this study was to investigate the frequency of impacted maxillary canines in patients who attended our outpatient department. The different results from these studies may arise from racial differences and differences in the methodology of the study. Because of the rarity of impacted canines in the mandible, they were not considered in this study. Indeed, most of the impacted canines were located in the maxilla, which had also been established as the predominant location by others.

The early recognition of canine impaction is very important from a therapeutic point of view. Impacted canines result in many complications and their early detection is imperative. The results of this study showed increased prevalence of impacted maxillary canines than data reported in other studies, while the dissimilarities may be attributed to the sample selection, method of the study and area of patient selection, which suggest racial and genetic differences.
Conclusion:

1. The prevalence of impacted maxillary canine was higher in cases who attended the O.P.D. of Sri Siddhartha Dental College & Hospital of the Sri Siddhartha University, Tumkur, Karnataka.

2. The prevalence of impacted maxillary canine was higher in females than in males and it is statistically significant.

Our data has shown that the prevalence of maxillary canine impaction is a common dental anomaly. The early recognition of canine impaction is very important from a therapeutic point of view. Impacted canine results in many complications and their early detection is imperative. The results of this study were slightly different than other studies, while the dissimilarities may be attributed to the sample selection, method of the study and area of patient selection, which suggest racial and genetic differences

References:


Fig. 1: Prevalence of Impacted Maxillary canines.

Table 1. Prevalence of impacted maxillary canines

<table>
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<tr>
<th>No. of months</th>
<th>Male</th>
<th>Female</th>
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<td></td>
<td>No.</td>
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