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INCIDENCE OF CANINE IMPACTION IN PATIENTS VISITING A DENTAL COLLEGE IN CHENNAI - A RETROSPECTIVE STUDY

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ABSTRACT:

INTRODUCTION: Impaction is defined as a cessation of eruption of a tooth caused by a clinically or radiographically detectable physical barrier in the eruption path or by an ectopic position of the tooth. Maxillary canines correspond to the most common impacted tooth following third molars. Canine impaction occurs more often in the maxilla than in the mandible. With this background, the aim of the present study is to assess the incidence of Impacted Canine among the the patients visiting a Private Dental Hospital in Chennai and also assess the Age and Gender predilection of Canine Impaction among the patients.

MATERIALS AND METHODS: The present study pilot descriptive study. The data for the present study was collected by analysing case sheets of patients who visited Saveetha Dental College from June 2019- February 2021. The collected data was subjected to statistical analysis using the SPSS software by IBM of version 23.

RESULTS: From the Results of the Present study it is seen that Impacted Canines slightly has a Male Predilection with incidence rate of 52.3% in Males and 47.8% were females, higher incidence of 40.4% was seen in 10-20 years age group. 59.5% of the Impacted Canines were the Maxillary Canines .
CONCLUSION: From the present study it is evident that Impacted Canines have a Male predilection. Maxillary canines were highly prevalent for impaction when compared to the mandibular canines

KEYWORDS: Canine, Impaction, Gender, Unilateral Impaction, Innovative study

INTRODUCTION:
Impaction is defined as cessation of eruption of a tooth caused by a clinically or radiographically detectable physical barrier in the eruption path or by an ectopic position of the tooth.(1,2). Tooth impaction is a pathological condition in which teeth are prevented from erupting into their proper positions due to a variety of factors including a lack of room in the dental arch, dental injury in the primary dentition, malposition, and other hindrances. Overlying gum, bone, or another tooth may prevent the tooth from erupting into the oral cavity (3,4) .
Canines are the most prominent teeth in the dental arch, serving as the base and cornerstone of an aesthetic smile and functional occlusion and it also forms the canine eminence at the corner of the dental arch, which supports the alar base and upper lip (5). Functionally, the canine assisting the dentition contributes to disarticulation of lateral movement in certain people because of its root length and volume, canine makes the best abutments for prosthetic replacement of other maxillary teeth when the need arises (6,7).
Maxillary canines, second only to third molars, are the most frequently impacted teeth, the rate of the impaction is about 2% of the population, and it is twice as prevalent in women as it is in men. However, the prevalence of mandibular canine impaction is at least 20 times less common than that of maxillary canine impaction. Canine impaction occurs more often in the maxilla than in the mandible (8,9). 8%of patients with affected maxillary canines have bilateral impactions. One-third of affected maxillary canines are labially located, while the other two-thirds are palatally located. Some of the common causes of canine impaction includes Ankylosis, irregular location of tooth bud, tooth length and size difference, cyst and tumours, delayed shedding or early loss of deciduous canine, iatrogenic, dilaceration, Malposed tooth germ, Alveolar cleft defect, Hereditary and idiopathic (10).
Caries, periapical lesions, periodontal disease, temporomandibular joint disorder, root resorption of adjacent teeth, and oral cysts and tumours are all complications that may occur as a result of impaction. For precise localization for diagnosis and treatment of impacted teeth, a panoramic radiograph and computed tomography may be used (11,12). Clinically, radiographs, both intraoral and panoramic, are known to be one of the most reliable ways to measure tooth impaction. Clinical diagnosis of Impacted Canine include Beyond 14–15 years of age, delayed eruption of the permanent canine or prolonged retention of the deciduous canine, Delayed eruption, distal tipping, or migration (splaying) of the lateral incisor in the absence of a regular labial canine bulge, and presence of a palatal bulge (13).
When the condition is detected early, extractions of deciduous canines cause the impacted canines to correct their eruption paths and erupt into the mouth in reasonably good alignment. This interceptive treatment can also minimise problems associated with palatally impacted canines, lateral incisor root resorption and the need for complex surgery and orthodontic intervention (14). Treatment of affected maxillary canines is a common problem that dental practitioners face on a regular basis. The biggest challenge is to align impacted canines with reduced morbidity to neighbouring teeth and periodontium (15,16).
Our team has extensive knowledge and research experience that has translated into high quality publications(17),(18),(19),(20),(31)(32–34)(35,36). With this background, the aim of the present study is to assess the incidence of Impacted Canine among the the patients visiting a Private Dental Hospital in Chennai and also assess the Age and Gender predilection of Canine Impaction among the patients.

MATERIALS AND METHODS:
Study Setting: The study was conducted with the approval of the Institutional Ethics Committee [SDC/SIHEC/2020/DIASDATA/0619-0320].
Study Design: It was a Retrospective study. The study was designed to include all dental patients of ages between 10-50 years with Impacted Canine teeth included in the study. The patients who did not fall into this inclusion criteria were excluded.
Sampling Technique: The study was based on a non probability consecutive sampling method. To minimise sampling bias simple random sampling was done. The advantages of the present study include the large availability

of data and similar ethnicity, and the disadvantages of this particular study were mainly the geographical limitations and the isolated populations.

Data Collection and Tabulation: A total of 5,35,951 patient treatment records between June 2019 to February 2021 were assessed for the study. The data collection and analysis were done by two examiners. Cross verification was done with the help of Photographs and radiographic evidence. The inclusion criteria were children between the ages of 10-50 years of age, patients who had Impacted Canine teeth, and complete records of the patient and treatment done in the case sheet with photographic evidence. Exclusion criteria for the study were patients below 10 years of age, incomplete case records, and missing photographic proof of completed treatment. To avoid sampling bias, simple random sampling was done. Based on the inclusion and exclusion criteria, dental records of 82 patients who had Impacted Canine teeth were finalised for data analysis.

Statistical Analysis: The extracted data were tabulated in a spreadsheet (Excel 2017: Microsoft Office) and analysed using SPSS Software by IBM Version 23.0 (SPSS, Inc., Chicago). Descriptive statistics and chi-square tests were performed with the level of significance at 5% ($p<0.05$).The results were obtained in the form of graphs and tables.

RESULTS:

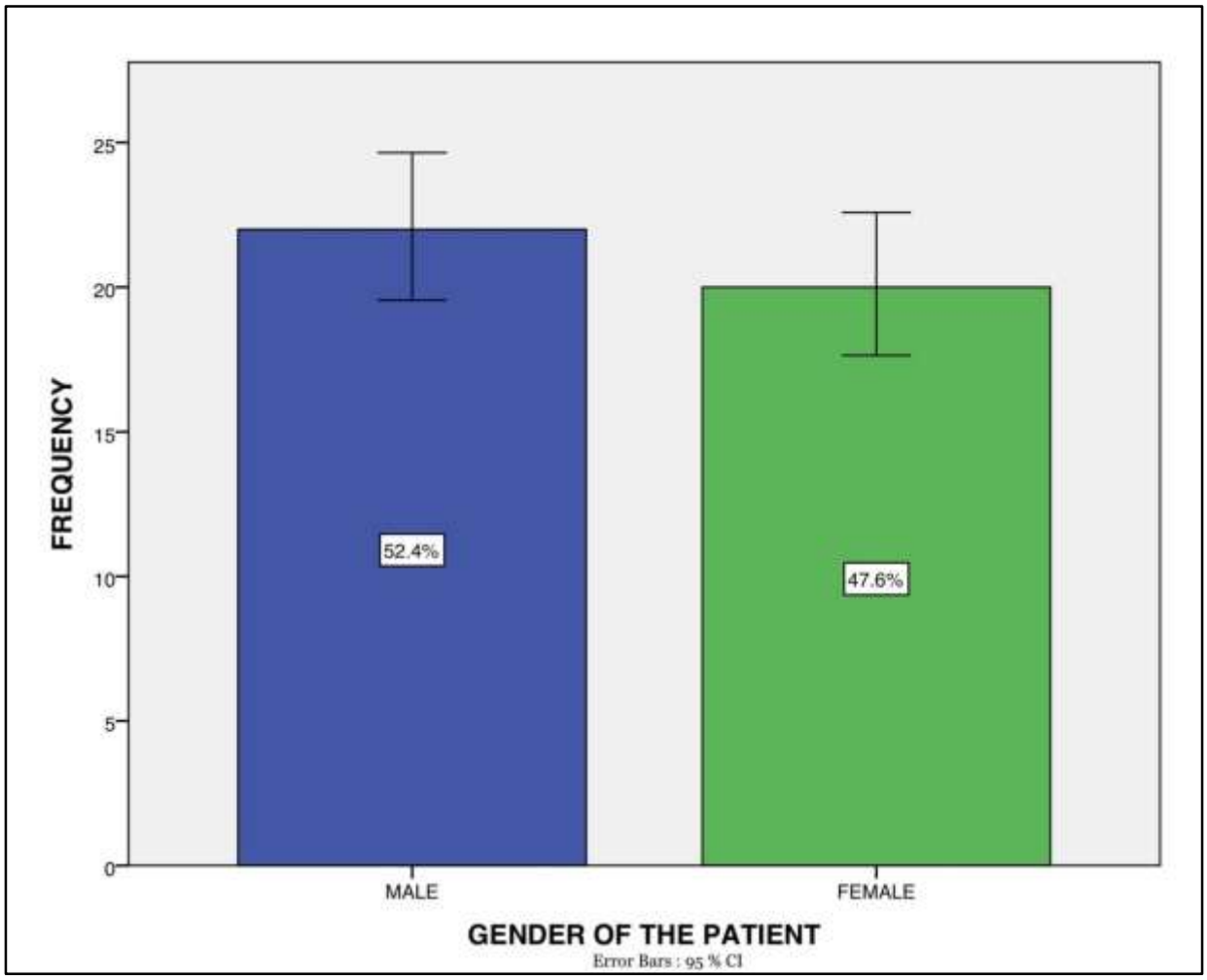

Figure 1, depicts the Gender of the Patient included in the present study. 52.3% were males represented in blue colour and 47.8% were females represented in Green colour.

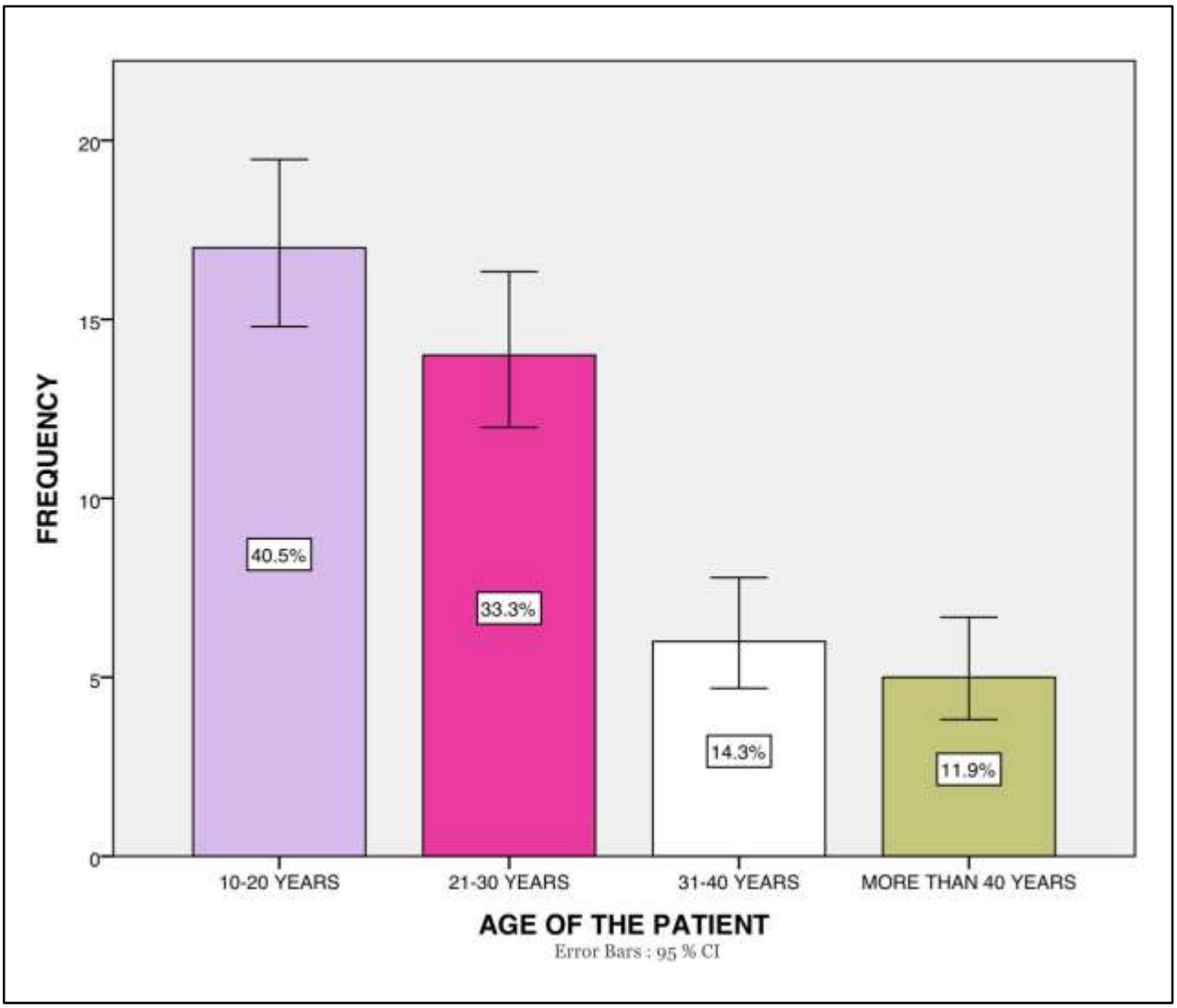

Figure 2, depicts the age group of the Patients with Impacted Canines 40.4% were in the age group of 10-20 years represented by Indigo colour, 33.3% were in the age group of 21-30 years represented by Pink colour, 14.2% were in the age group of 31-40 years represented by White colour, 11.9% were in the age group of More than 40 years of Age represented by Light Brown colour.

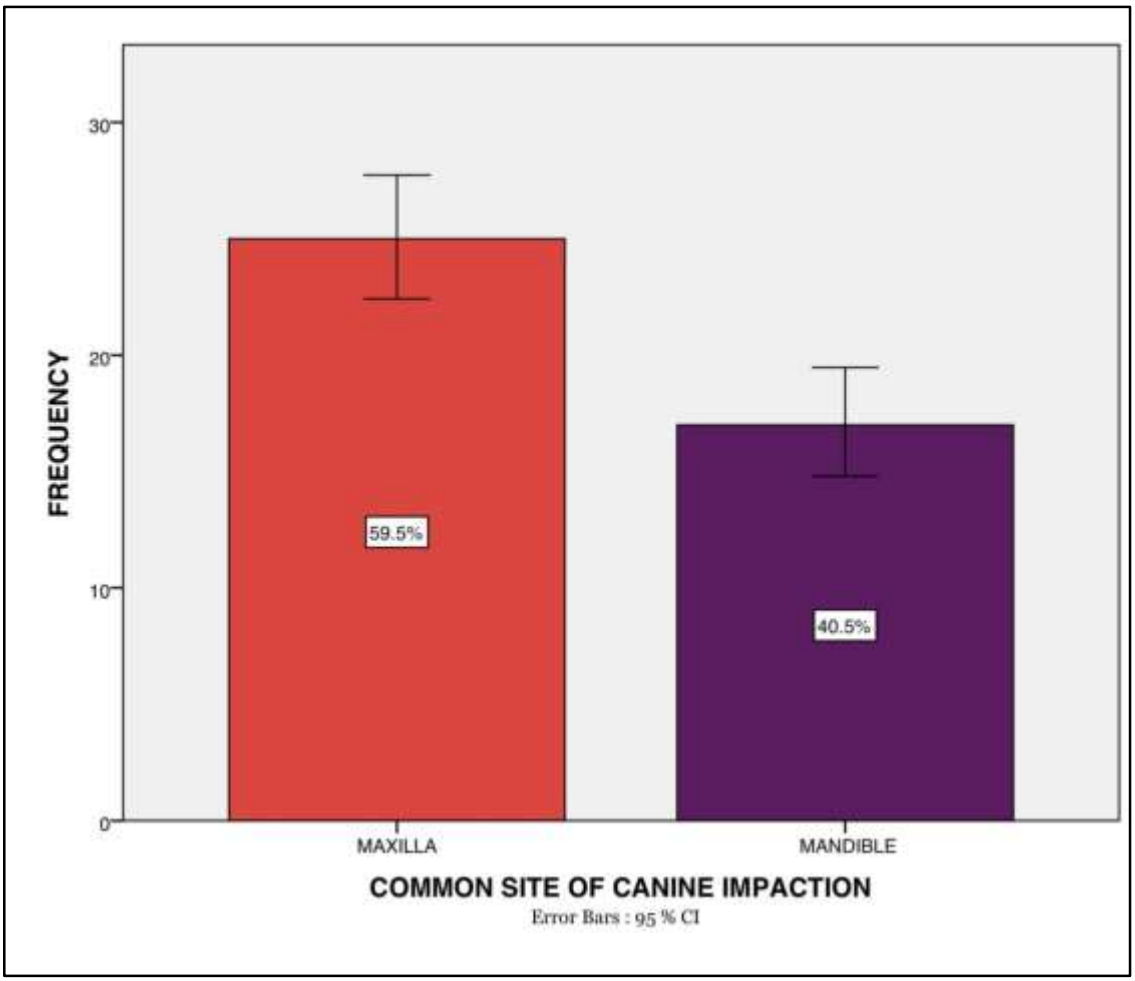

Figure 3, depicts the Location of commonly Impacted Canine in the present study. 59.5% of the Impacted Canines were the Maxillary Canines represented in Red colour and 40.8% of the Impacted Canines were the Mandibular Canines represented in Violet colour.

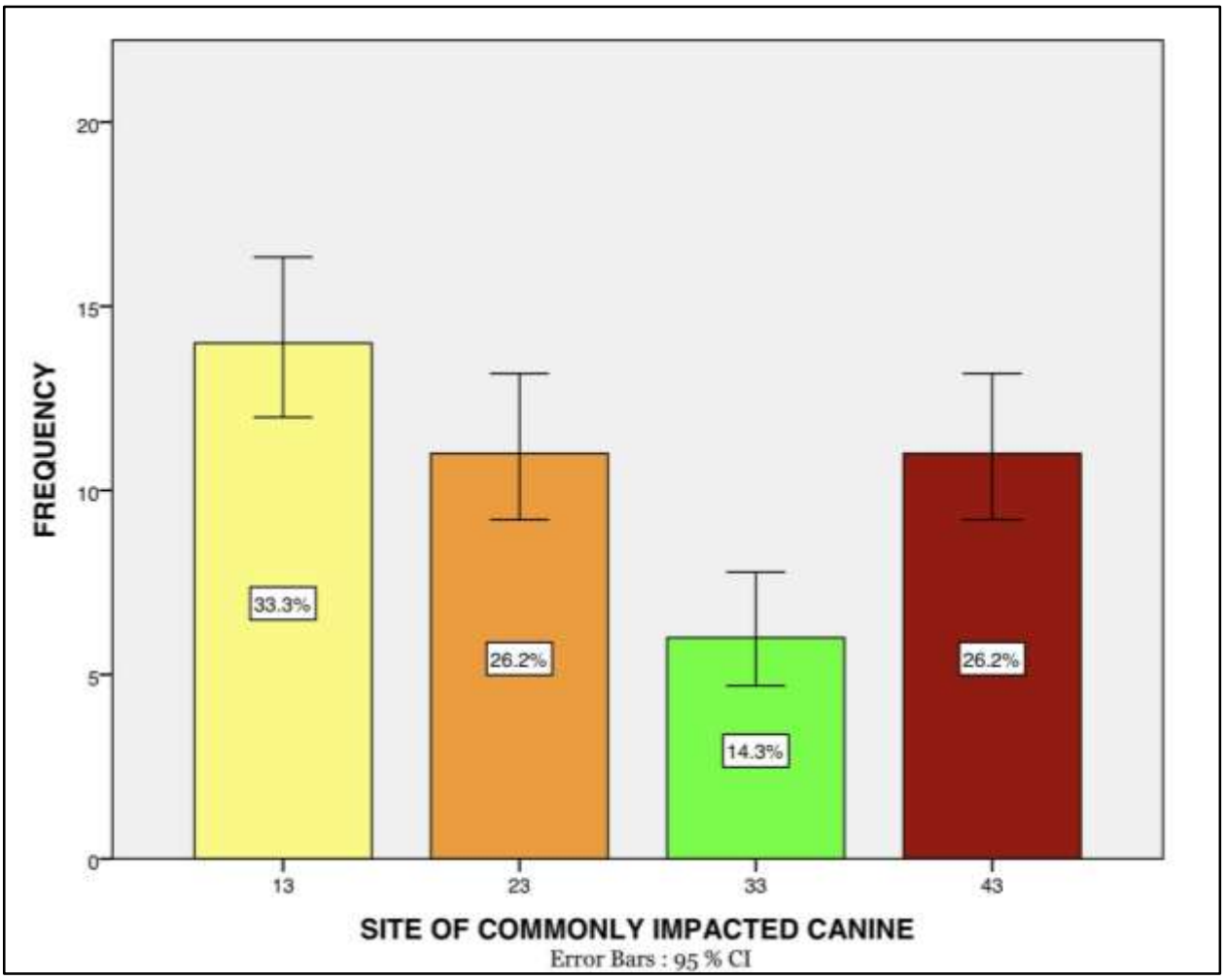

Figure 4, depicts the Site of Commonly Impacted Canine among the Patients, 33.3% had Impacted Canine in the Maxillary Right side of the Arch, 13 represented by Yellow Colour; 26.1% had Impacted Canine in the Maxillary Left side of the Arch, 23 represented by OrangeColour, 14.2% had Impacted Canine in the Mandibular Left side of the Arch,33 represented by Light Green Colour, 26.1% had Impacted Canine in the Mandibular Right side of the Arch,43 represented by Maroon Colour

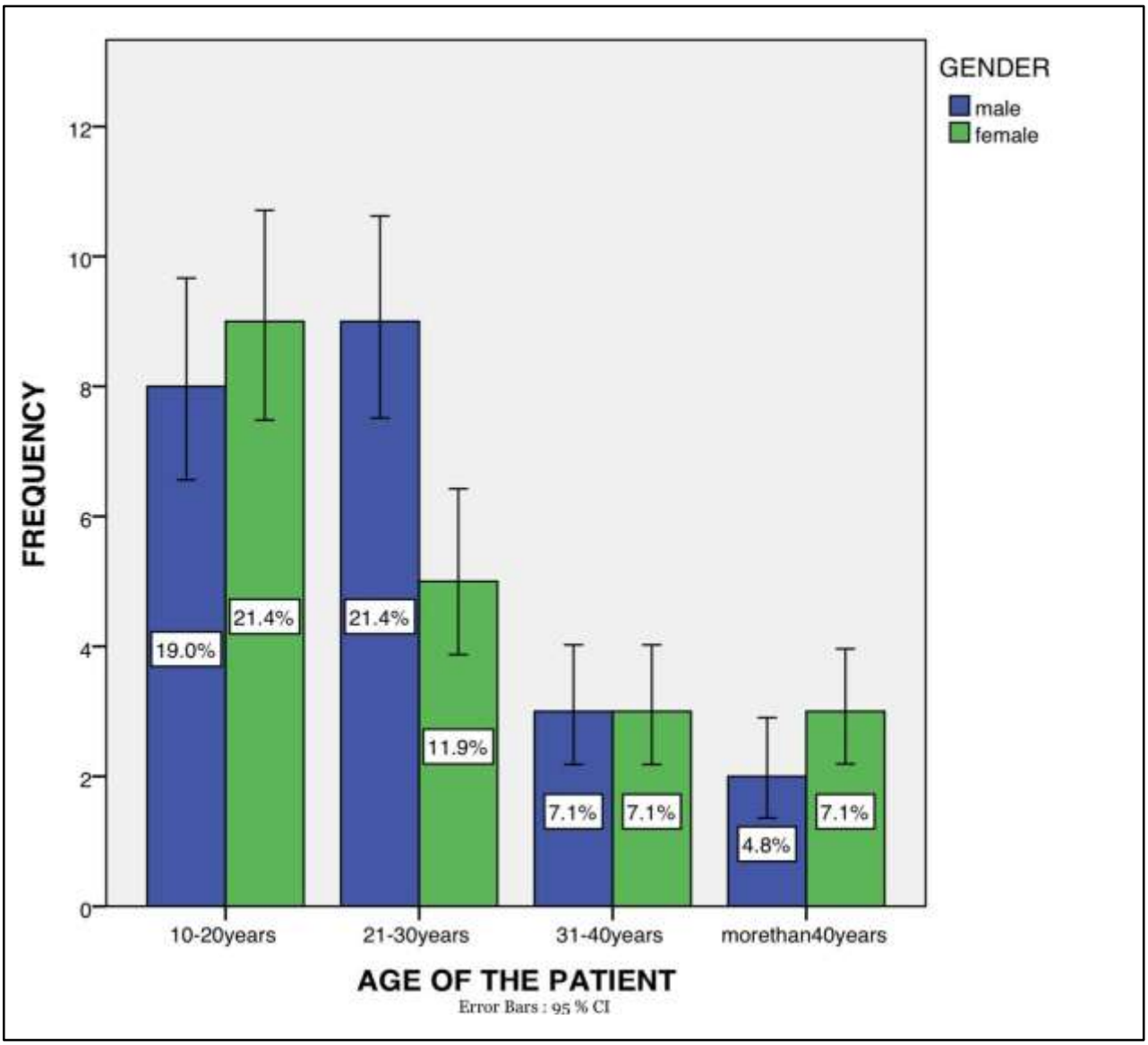

Figure 5, represents the association between Age and Gender of the patient with Impacted Canine. The X-axis represents the Gender of the Patients according to their Age group and Y-axis represents the Frequency of the Patients with Impacted Canines. Blue colour represents the Males and Green colour Females. Around 21.4% of Males incident with Impacted Canine were in the age Group of 21-30 years, whereas 21.4% of Females incident with Impacted Canine were in the age Group of 10-20 years. However, this association between Age and Gender of the patient with Impacted Canine included in the present study is Statistically insignificant with chi-square value - 30.42 and p-value = 0.2 (p-value > 0.05) hence insignificant.

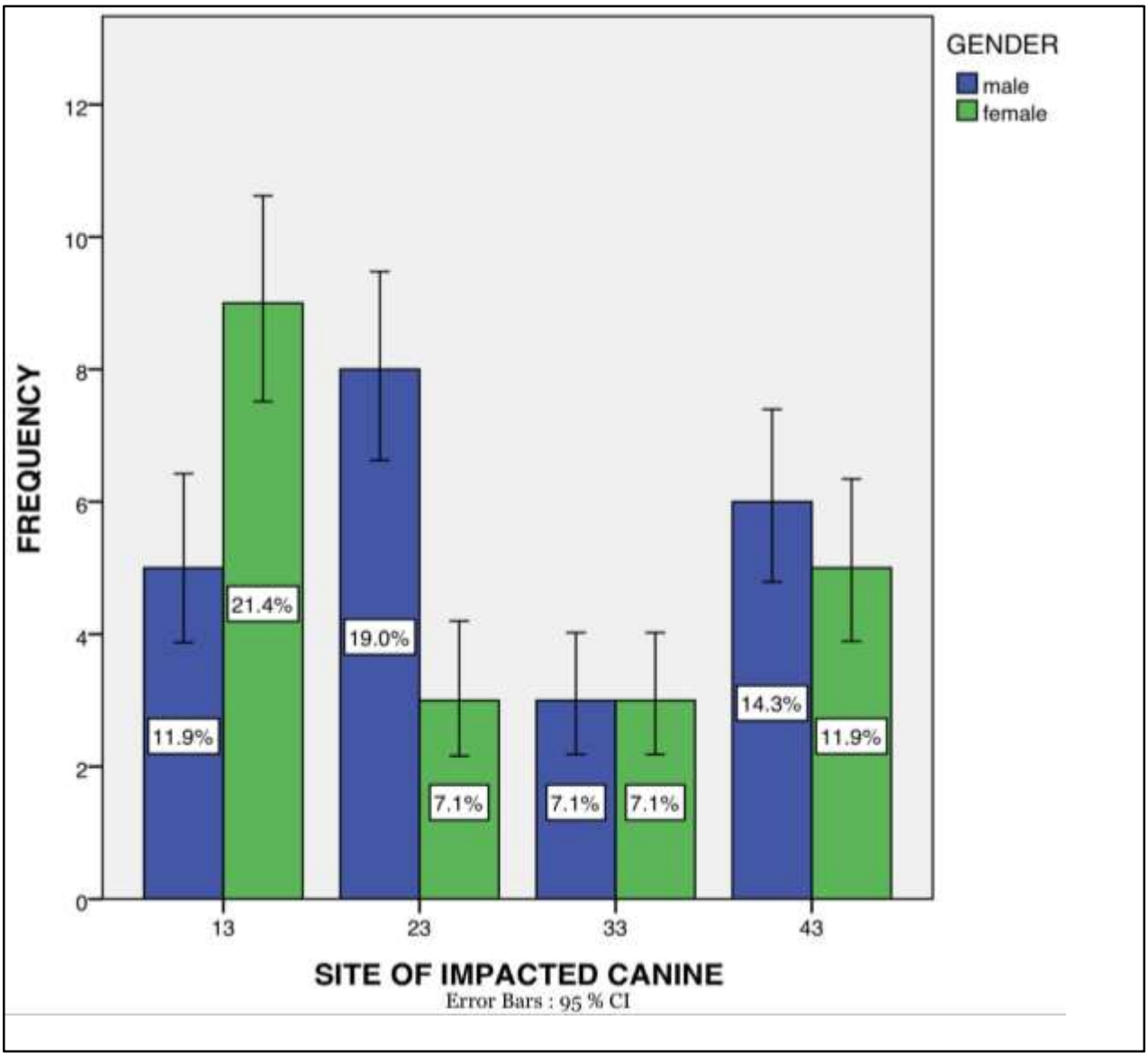

Figure 6, represents the association between Site of Commonly Impacted Canine and Gender of the patient with Impacted Canine. The X-axis represents the Gender of the Patients according to the Site of Impacted Canine and Y-axis represents the Frequency of the Patients with Impacted Canines. Blue colour represents the Males and Green colour Females. Around 19.05% of Males were incident with Impacted 23, whereas 21.4% of Females incident with Impacted 13. There is also Statistical Significance between Site of Commonly Impacted Canine and Gender of the patient with Impacted Canine included in the present study with chi-square value - 20.42 and p-value = 0.02 (p-value < 0.05) hence significant proving that Maxillary Arch Canines are more prone for Impaction compared to the Mandibular Canines.

DISCUSSION:

An unerupted or impacted tooth is considered a clinical problem and also a hindrance in regular functions of mastication, creating an issue also for the orthodontist in terms of diagnosis, anchorage control, and treatment period. From the current study, it is inferred that 1265 patients had impacted teeth of which 92 patients had impacted canines, with an incidence rate of 7.2%. It was evident from the present study that males had more incidence with impacted canines than females with an incident rate of 52.4% and 47.6% respectively. In accordance with present study Joshini et al., also reported an increased incidence of impacted canine in males compared to females

(37).Contrastingly a study by Nagpal et al., reported with higher incidence in females (38).The variations between male and female Canine Impaction can be attributed to the fact that skull, maxilla and maxillary measurements in women are smaller than in men (39).

Maxillary canines erupt at an average age from 11-12 years of age. Canines that are positioned buccally are more common than those that are positioned palatally. Canines that were placed buccally had enough room for eruption, while canines that were placed palatally had insufficient room for eruption (40). Increased incidence of Impacted Canine was seen in the 10 - 20 years age group with a rate of 40.4% and least incidence of 11.9% was seen in patients more than 40 years age group (Fig 2) . Prevalence of impacted teeth gradually decreased with the progression of age. In contrast, Nurul et al., reported an increased of Impacted teeth in 21-30 years age (41).

From the results we infer that, 59.5% had Canine Impaction in the Maxilla and 40.8% had Mandibular Canine Impaction (Fig 3) , 33.3% had impacted canine in the right maxilla followed by the 26.1% in the left maxilla (Fig4). In concordance with this study Rohuma et al., also reported increased Maxillary impacted Canines than the Mandibular impactions (42). Around 8% of patients with affected maxillary canines have bilateral impactions. One-third of affected maxillary canines are labially located, while the other two-thirds are palatally located. Surgical exposure with natural eruption and surgical exposure with the placement of an auxiliary attachment are two of the most widely used techniques for treating the Impacted Canine Teeth. Following this process, orthodontic pressures will be used to lift the impacted tooth. This is appropriate because the canine has a proper axial tendency and does not need to be uprighted during eruption (43).

Age and Gender of the patient incident with canine impaction was correlated with the frequency it is evident that 21.4 % of impaction in males were in the age group of 21-30 years wherein in 21.4% Females were in the age group of 10-20 years. (Fig 5). Early detection and prevention of possible impaction is the best way for treating impacted maxillary canines. Clinicians should consider orthodontic care accompanied by surgical exposure of the canine to put it into occlusion, in worst cases extraction of the impacted canine should be done to avoid complications. Surgically exposing the teeth and allowing them to erupt spontaneously during early or late mixed dentition, as well as surgically exposing the teeth and inserting a spacer, are the two most common methods for bringing palatally impacted canines into occlusion (44,45).

The association between site of commonly impacted canine and gender of the patient with impacted canine revealed that, around 19.05% of males had impacted 23 teeth and 21.4% of females had impacted 13 teeth (fig 6). However, maxillary canines were more prone for impaction than the mandibular canines. The majority of the studies report bilateral impactions are more common than the unilateral impaction. Palatal canine impaction was five times more common in European populations than in an asian populations (46,47). Labial impactions are 2.1 times more common than palatal impactions among the Chinese population (48).

To restore impacted maxillary canines, a variety of surgical and orthodontic procedures may be used. However, careful control of these teeth necessitates the use of the proper surgical procedure and the ability of the clinician to apply calibrated forces in a desirable direction (49,50). This allows for complete control over the impaction's correction and the prevention of damage to neighbouring teeth. The successful alignment of impacted canines requires careful selection of surgical and orthodontic techniques (51).

The limitations of the present study include the reduction or lack of availability of the amount of data collected, the uneven distribution of events, it is a Retrospective study, minimal external validity and the lack of location-specific data. As a result, the findings of this study must be interpreted in light of its limitations, and further cohort studies with a larger sample size must be conducted. Other relevant variables, such as the treatment plan, surgical operation, and so on, should be included in such a report.

CONCLUSION:

From the present study it can be concluded that Impacted Canines have a Male predilection and 10-20 years of age patients were more likely susceptible to be incident with impacted canines. The odds of the maxillary canines being impacted are higher than the mandibular canines. The eruption of canine plays a vital role in facial appearance, dental aesthetics, arch development and functional occlusion. Thus, the early diagnosis of canine impaction at an early stage is crucial to carry out a proper and successful orthodontic treatment.

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CONFLICT OF INTEREST :
The authors declare no conflict of interest

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