Volume 10, Issue 5, May – 2025 International Journal of Innovative Science and Research Technology
ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886

# Knowledge and Attitude Regarding the Management of Impacted Maxillary Canine Teeth among Undergraduate Students

Dr. Sharath Kumar Shetty[1]; Dr. Mahesh Kumar. Y[2]; Dr. Sharanya. P[3]

[1, 2, 3] K.V.G Dental College and Hospital

Publication Date: 2025/06/4

**Abstract:**

- ***Purpose:***
  **The purpose of the study was to assess the knowledge of Maxillary Impacted Canine among BDS undergraduates.**
- ***Materials and Methods:***
  **The participants included 200 BDS graduates. The participants Knowledge regarding Impacted Maxillary Canine were recorded using a specially designed Questionnaire with 19 questions.**
- ***Results:***
  **The results were interpreted in pie chart, in which they were aware of Impacted Maxillary Canine and various procedures involved in managing the impacted canine.**
- ***Conclusion:***
  **The knowledge, awareness on management of impacted maxillary canine teeth among undergraduate students is necessary for patient management and efficient treatment.**

**How To Site:** Dr. Sharath Kumar Shetty; Dr. Mahesh Kumar. Y; Dr. Sharanya. P (2025). Knowledge and Attitude Regarding the Management of Impacted Maxillary Canine Teeth among Undergraduate Students. *International Journal of Innovative Science and Research Technology,* 10(5), 3299-3309. https://doi.org/10.38124/ijisrt/25may1886

## I. INTRODUCTION

An impacted tooth refers to one that fails to follow its normal eruption path and remains embedded within the soft tissue or alveolar bone. Maxillary canine teeth are the most frequently impacted, second only to third molars. The prevalence of canine impaction ranges from 0.92% to 4.3%, with females being twice as likely to experience impaction compared to males. Additionally, maxillary canine impaction occurs more frequently than mandibular impaction, with a ratio of 2:1. In terms of location, the buccal plate is involved in one-third of cases, while the palatal aspect is affected in the majority of cases.[1]

During the development of the maxillary canine, the tooth is initially angled mesially and situated over the apical third of the lateral incisor roots. As the canine moves downward along the distal side of the lateral incisor roots over the next two to three years, it exerts pressure on the central and lateral incisors, aiding in the uprightness of the incisor crowns. However, impacted maxillary canine teeth deviate from this typical developmental path due to various factors, including overcrowding, insufficient space in the dental arch, irregularities in tooth shape or size, or genetic predisposition.[2]

Clinical indicators of canine impaction include distal crown tipping of the lateral incisor, over-retention of the primary canine, delayed eruption of the permanent canine, and the absence of a labial bulge in the buccal sulcus by the age of 10 to 11. However, the absence of the canine bulge at younger ages may not always be a sign of canine impaction, and radiographic assessment is required for proper diagnosis. Traditional 2D imaging techniques like orthopantomography and occlusal and periapical radiography might not be very effective for this purpose. Cone-beam computed tomography (CBCT) provides more detailed and higher-resolution images than traditional 2D radiography, allowing for clearer visualization of internal and external root resorptions. CBCT aids in precise diagnosis and treatment planning by visualizing the position and degree of impaction. The sensitivity and accuracy of treating canine impaction have been greatly increased overall by CBCT, which may also lead to a better prognosis.[3]

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886

The lack of symptoms, particularly in palatally impacted canine teeth, presents a barrier in identifying tooth impaction. As a result, these cases often go unnoticed until the primary canine exfoliates on its own later in life. Canine impaction may be discovered incidentally during regular dental exams. This delayed diagnosis can make treatment choices more challenging and increase the risk of negative effects associated with dental impaction, such as dentigerous cysts, internal/external root resorption, decrease of arch length, and migration of nearby teeth with referred discomfort, infection, and formation. Therefore, it is essential to monitor tooth development and eruption as part of routine dental checkups for developing children between the ages of 10 and 13. In this age group, ectopic eruption of maxillary canine teeth may cause resorption of permanent incisors in about 0.71% of children.[4]

The complexity of the situation and the position, angulation, and morphology of the impacted tooth will determine how long it takes to rectify malocclusion and relocate an impacted canine tooth; on average, this process may take 24 months. In contrast to treating a similar malocclusion without tooth impaction, the duration of treatment may be greater when treating an impacted canine accompanied by malocclusion. Furthermore, because of increased bone mineral density, treatment may last much longer in adult patients, especially after puberty. The impacted canine is more difficult to reposition into its proper place due to its increased density.[5] Several methods for treating canine impaction have been proposed, including auto-transplantation, implant placement, orthodontic traction, and extraction of the primary canine tooth to allow the impacted tooth to emerge spontaneously. It is important to consider the patient's overall malocclusion when treating an impacted canine. Orthodontists should create a comprehensive treatment plan that takes into account all of the current skeletal and dental abnormalities to ensure effective and suitable treatment of the impaction. By doing so, orthodontists can increase their chances of achieving good results for their patients.[6]

## II. MATERIALS AND METHODOLOGY

A total of 200 BDS graduates participated in the study, and their knowledge of Impacted Maxillary Canines was evaluated using a custom-designed questionnaire.

- *Questionnare*

**1. The Maxillary Canines erupts at the age of**

a. 6-7 years
b. 9 years
c. 11-12years
d. 11-12years

**2. What is the prevalence of maxillary canine impactions in the general population?**

a. 3%
b. 2%
c. 4%
d. 1%

**3. what is the most common Etiology of labial Canine impactions?**

a. Narrow maxillary arch
b. idiopathic or iatrogenic factors
c. Retention or ankylosis of primary canine
d. Cyst or apical pathology of primary canine

**4. Which of the following is the definite diagnostic tool for detecting canine ankylosis?**

a. Absence of PDL space on a periapical radiograph
b. CBCT evaluation
c. Impaction depth
d. None of above

**5. When examining a patient with canine impaction, which factor is the most important success predictor?**

a. Patient's age
b. Angulation of impaction
c. Depth of impaction
d. None of above

**6. what is the most common type of impaction for maxillary canines?**

a. Unilateral palatal impaction
b. Unilateral labial impaction
c. Bilateral palatal impaction
d. Bilateral labial impaction

**7. what is the guidance theory for canine eruption?**

a. Canines erupt along the root of the central incisor
b. Canines erupt along the root of the first premolar
c. Canines erupt along the root of the lateral incisor
d. Canines erupt along the root of the second premolar

**8. What is a potential challenge in orthodontic management of Maxillary impacted canines?**

a. Incorrect diagnosis of the impaction
b. Insufficient space creation in the arch
c. Inadequate bonding of the orthodontic bracket
d. Deviation from the predicted path of eruption

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886

**9. What is the ratio of females to males affected by Maxillary impacted canines?**

a. 4:1
b. 1:1
c. 2:1
d. 3:1

**10. What is the potential complication of surgical exposure in Maxillary impacted canines?**

a. Root resorption of adjacent teeth
b. Inadequate orthodontic movement
c. Root fracture or damage
d. All of the above

**11. What is the primary reason for arch length discrepancy in Maxillary impacted Canines?**

a. Prolonged retention of primary canines
b. Overcrowding
c. Abnormal tooth development and eruption
d. Genetic predisposition

**12. What is the common symptom associated with Maxillary impacted canines?**

a. Dry mouth
b. Pain, swelling and infection
c. Bleeding gums
d. Swollen lymph nodes

**13. Extraction of the primary canine as an interceptive treatment can reduce the chances of canine impaction**.

a. I agree
b. I have no opinion
c. I disagree

**14. In space-deficient cases, when would you gain space for an impacted canine?**

a. Before canine exposure
b. While distalizing the canine away from the lateral incisor root
c. After exposing the canine and before orthodontic force application
d. None of above

**15. How are Impacted Maxillary Canines classified?**

a. Into five classes based on their location in the oral cavity
b. Based on relation to the second molar
c. Based on Winter's classification
d. Based on depth in the bone

**16. Should Bonding be done on the same day as the exposure, followed by immediate orthodontic force application.**

a. I agree
b. I have no opinion
c. I disagree

**17. In which of the following conditions would treating maxillary canine impaction be difficult?**

a. Absence of PDL space on a periapical radiograph
b. 50% of root development
c. Follicular width more than 2 mm
d. Less than 2 mm distance from the maxillary sinus

**18. In which of the following conditions would treating maxillary canine impaction be easier?**

a. Incisors root resorption
b. 2/3 of canine root development
c. Presence of dentigerous cyst
d. Horizontal impaction of canine

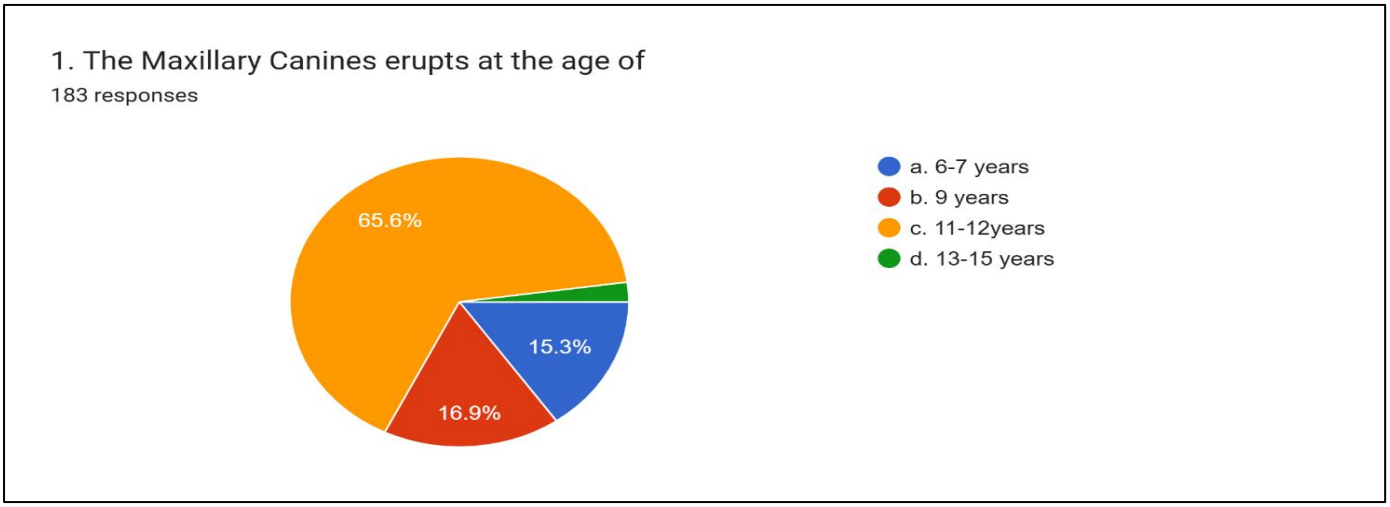
**19. What is the purpose of fixed or removable retainers in post treatment retention of Maxillary impacted canines?**

a. To maintain the alignment of the teeth
b. To monitor for root resorption
c. To promote further orthodontic movement
d. To diagnose ankylosis or infra-occlusion

## III. RESULTS

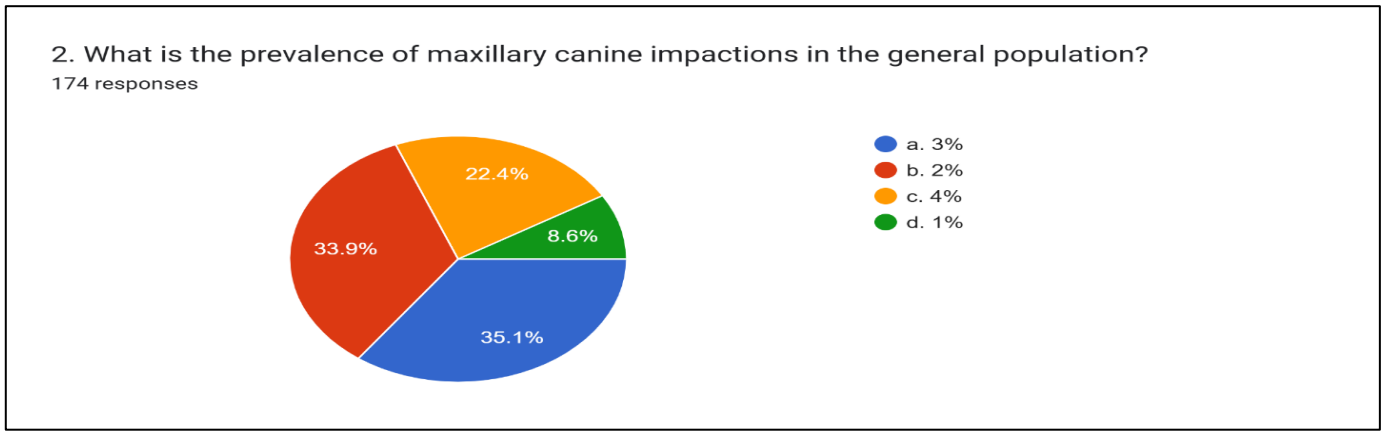
A questionnaire consisting of 19 questions was distributed among dental students and knowledge, awareness, and attitude on Impacted Maxillary Canines were assessed. The responses deduced were, a question on The Maxillary Canines erupts at the age of, 66.5% responded that during 11-12 years canine erupted, 16.9% said that around 9 years canine erupted, 15.3% claimed that canine erupted at the age of 6-7 years, remaining said that at 13-15 years maxillary canine was erupted.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886

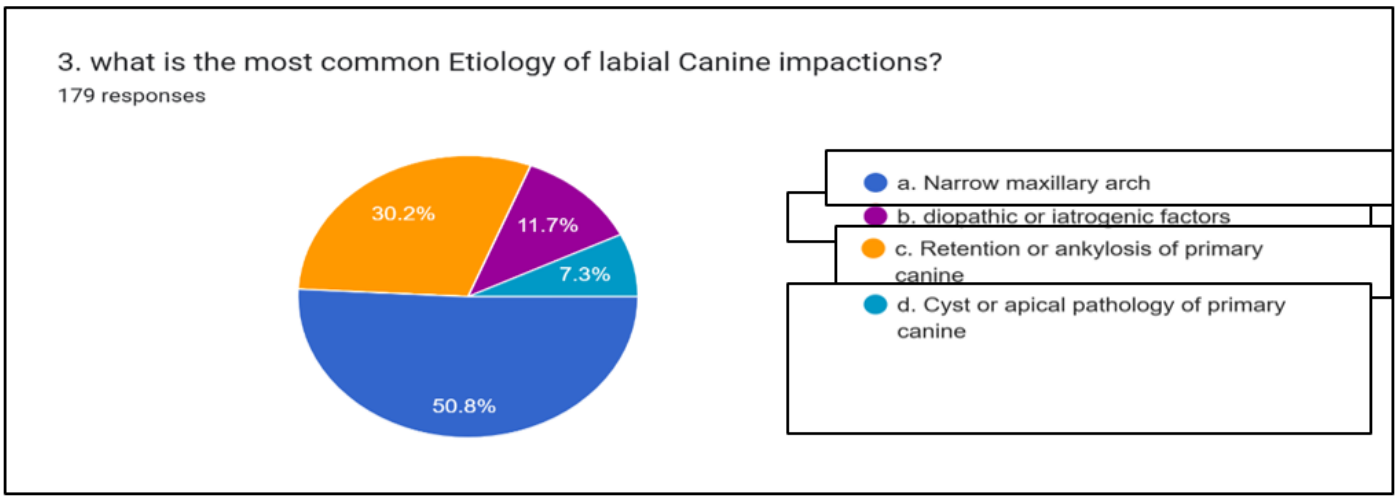



33.9% telling that prevalence of maxillary canine impactions in the general population was 2%, 35.1% said that 3% was prevalence of canine impactions, 22.4%

Claimed that it was 4% was prevalence rate and 8.6% said 1% was the prevalence

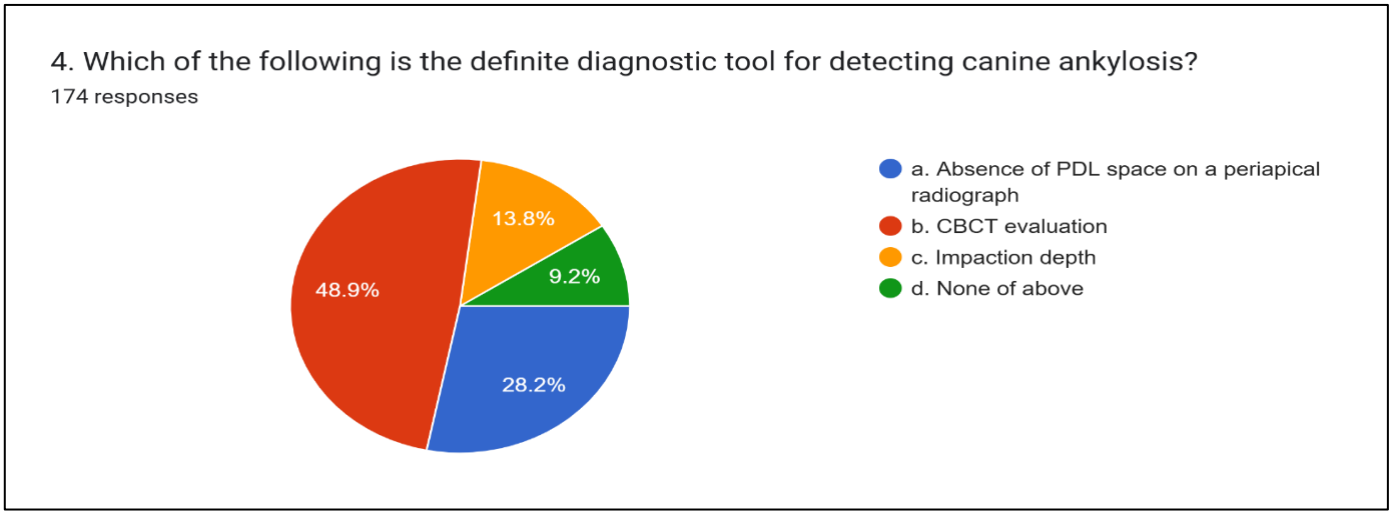



50.8% said Narrow maxillary arch is the most common etiology of labial canine impactions, 30.2% claimed that Retention or ankylosis of primary canine was the common etiology, 11.7% said it was idiopathic or iatrogenic factors, 7.3% said it was cyst or apical pathology of primary canine

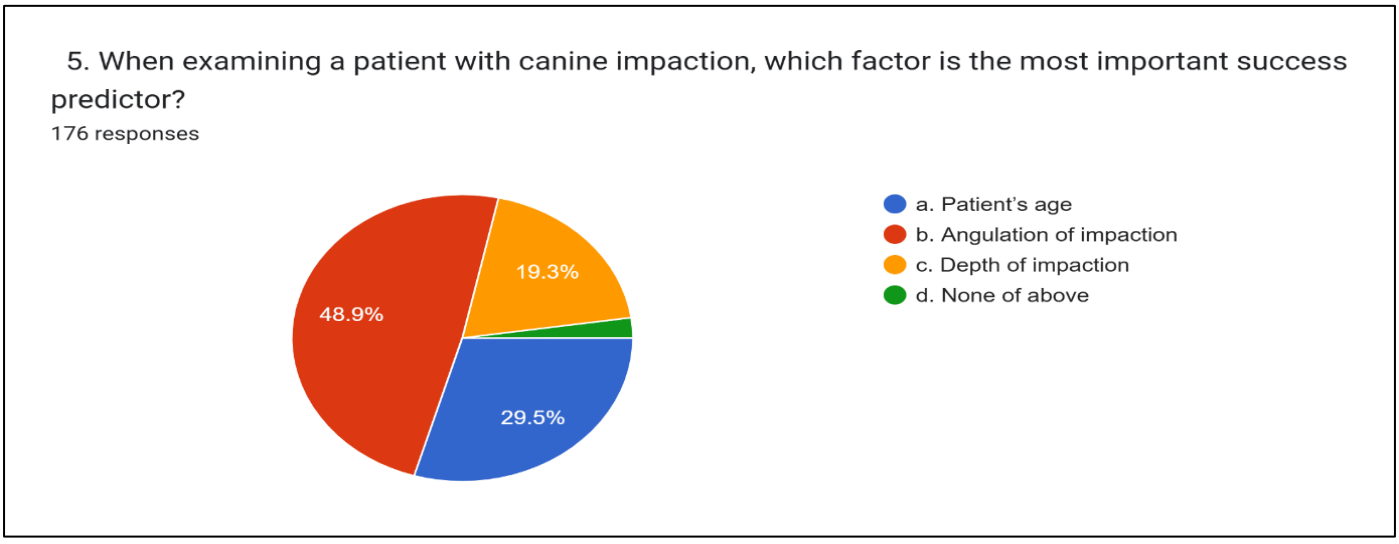



8.9% responded that CBCT evaluation was the definite diagnostic tool for detecting canine ankylosis, 28.2% said Absence of PDL space on a periapical radiograph was diagnostic tool, 13.8% was Impaction Depth.

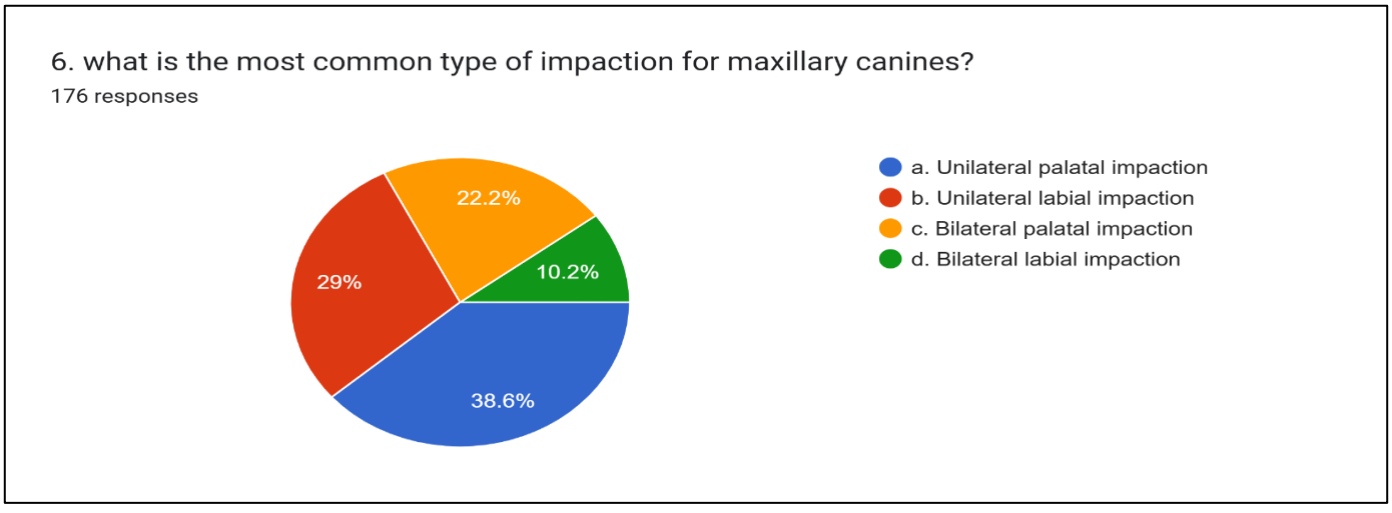
ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886




48.9% said that Angulation of impaction is the most important factor for success predictor, 29% said it was patients age, 19% claimed that Depth of Impaction was the predictor.

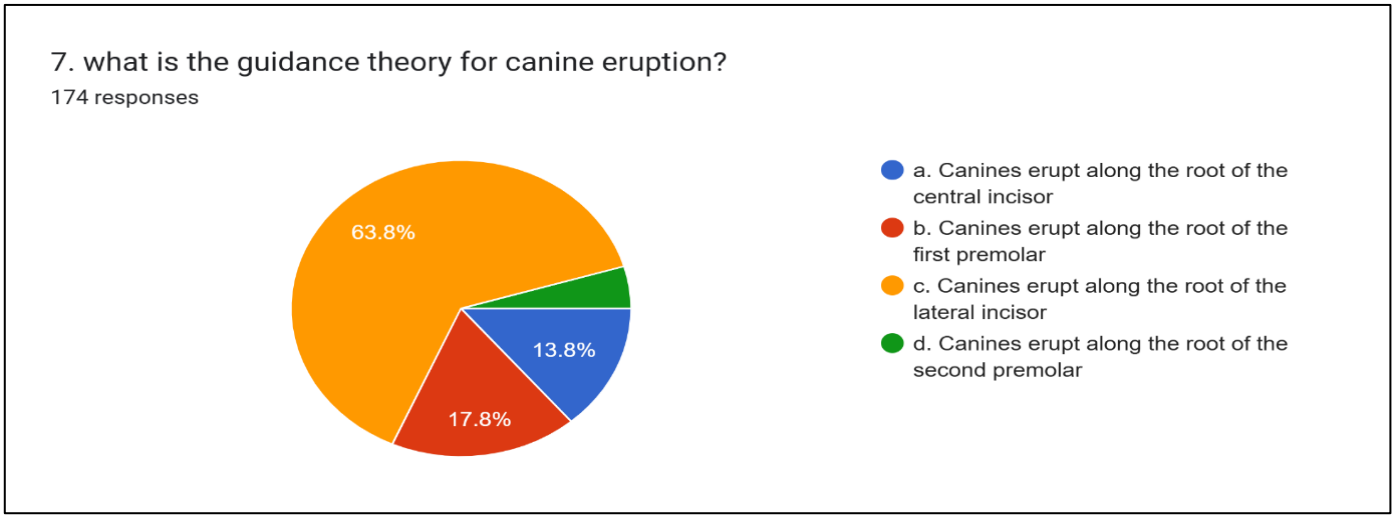



38% said Unilateral palatal impaction is the common type of Maxillary canine impaction, 29% said Unilateral labial impaction, 22% said it was Bilateral palatal impaction and 10% claimed the Bilateral labial impaction was the most common type

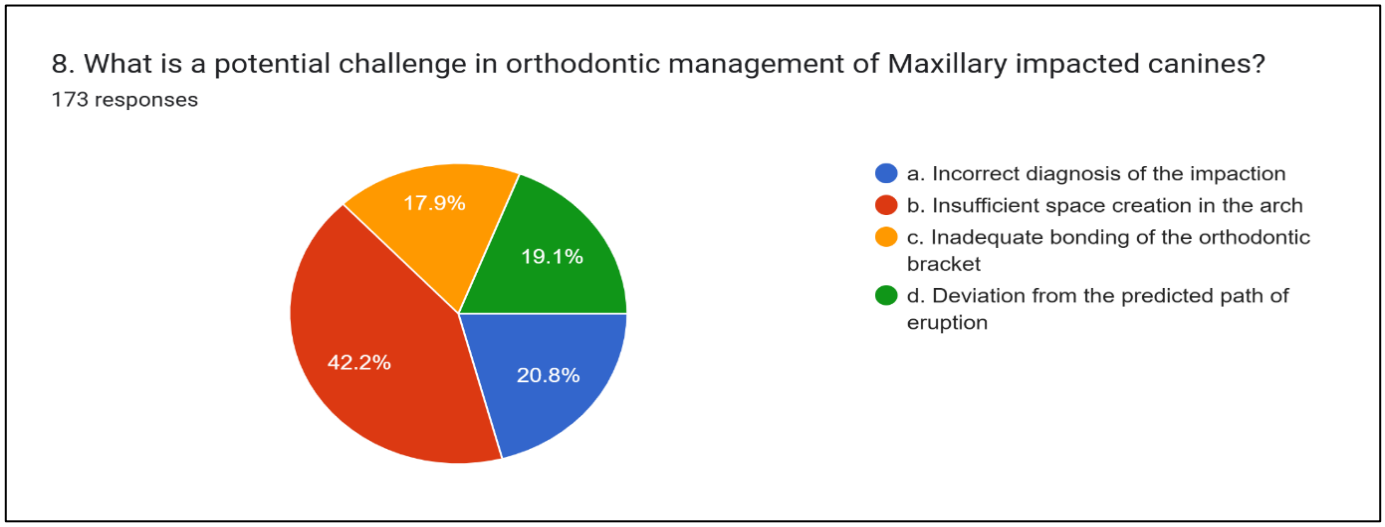



64% said Canines erupt along the root of the lateral incisors, 17% said that canines erupt along the root of the first premolar, 14% claimed that canines erupt along the root of the central incisor.

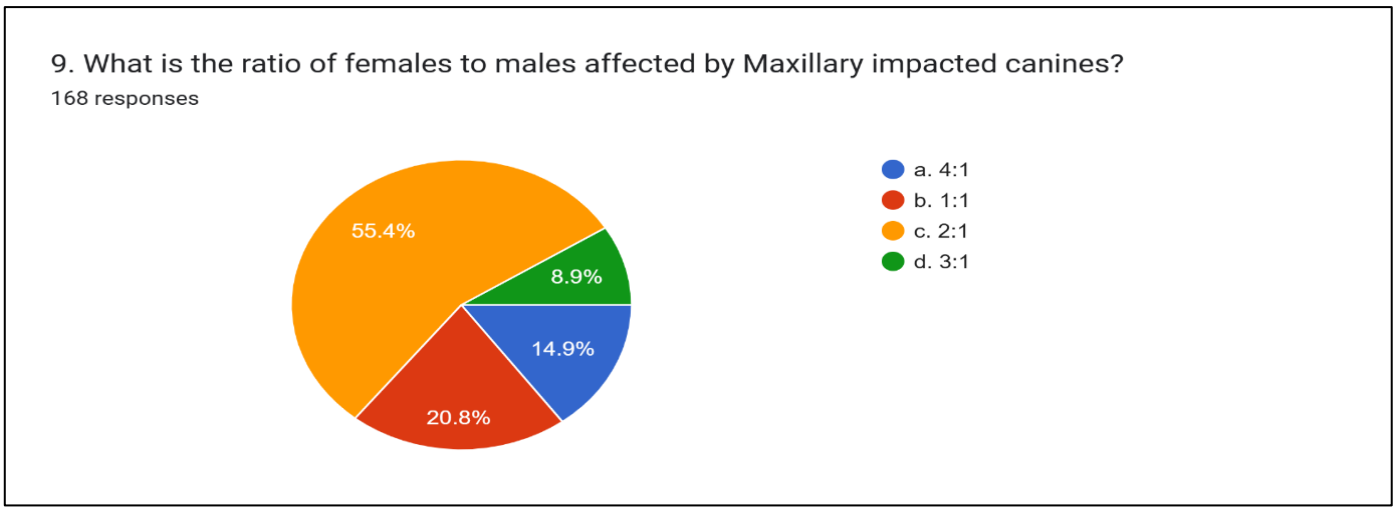
ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886




A question on potential challenge in orthodontic management of Maxillary impacted canines 43% said its due to insufficient space creation in the arch, 21% said it was due to incorrect diagnosis of the impaction, 19% said it was Deviation from the predicted path of eruption, 18% claimed that inadequate bonding of the orthodontic Bracket was a challenge.

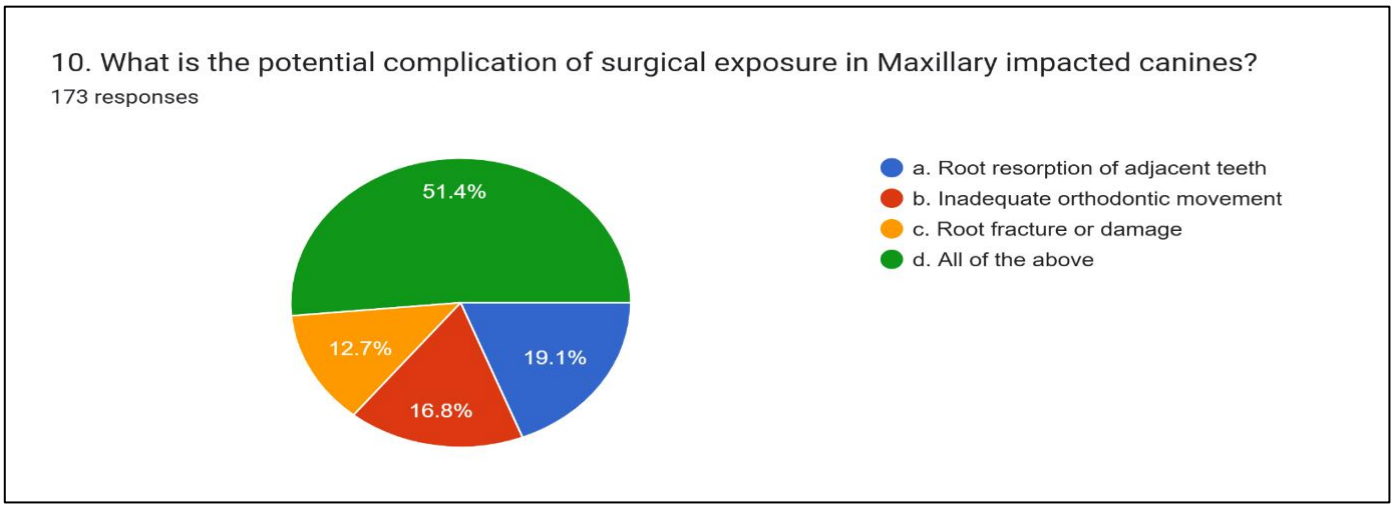



Ratio of females to males affected by Maxillary impacted canines 56% said females are affected twice the no of males, 21% said females and males were affected equally, 15% said females to be affected four times greater as compared to males, 9% claimed that females are affected three times more than males

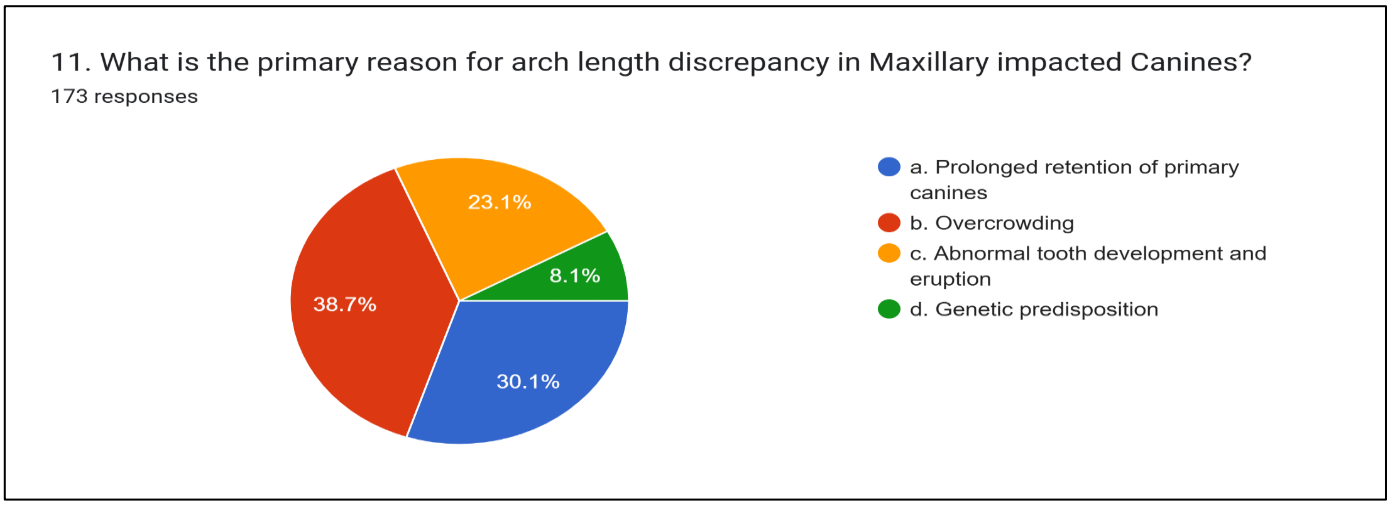


ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886

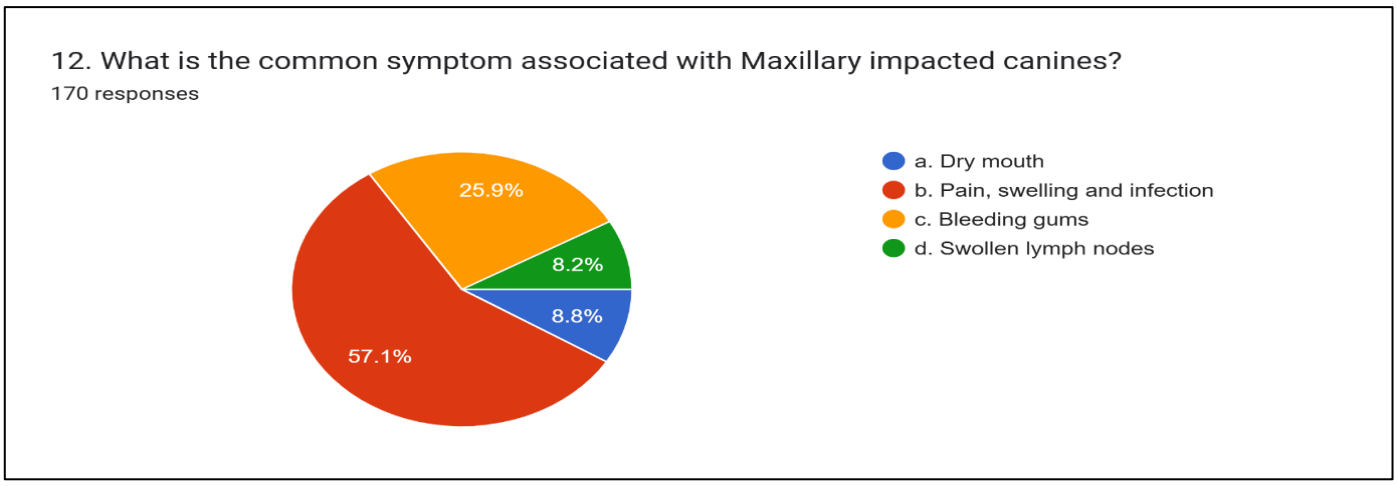
52% said Root resorption, inadequate orthodontic movement and Root fracture or damage are the potential complication of surgical exposure in Maxillary impacted canines, 20% said it was Root resorption of adjacent teeth, 16% claimed it was due to inadequate orthodontic movement, 12% said it as Root fracture or damage




38% said Overcrowding is the primary reason for arch length discrepancy in Maxillary impacted canines, 30% said prolonged retention of primary canines was the reason, 23% claimed Abnormal tooth development and eruption caused discrepancy, 8% said it was due to Genetic predisposition.

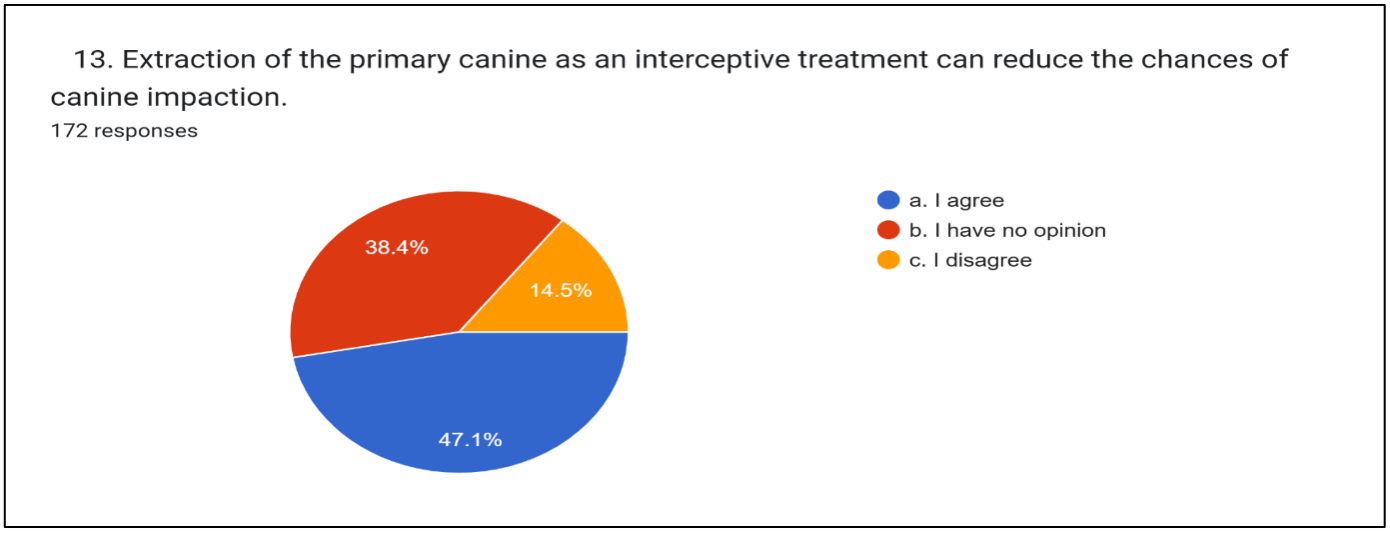



The common symptom associated with Maxillary impacted canines, 57% said it was pain, swelling and infection, 26% said it was Bleeding gums, 9% claimed to be Dry mouth and 8% said it was swollen lymph nodes.

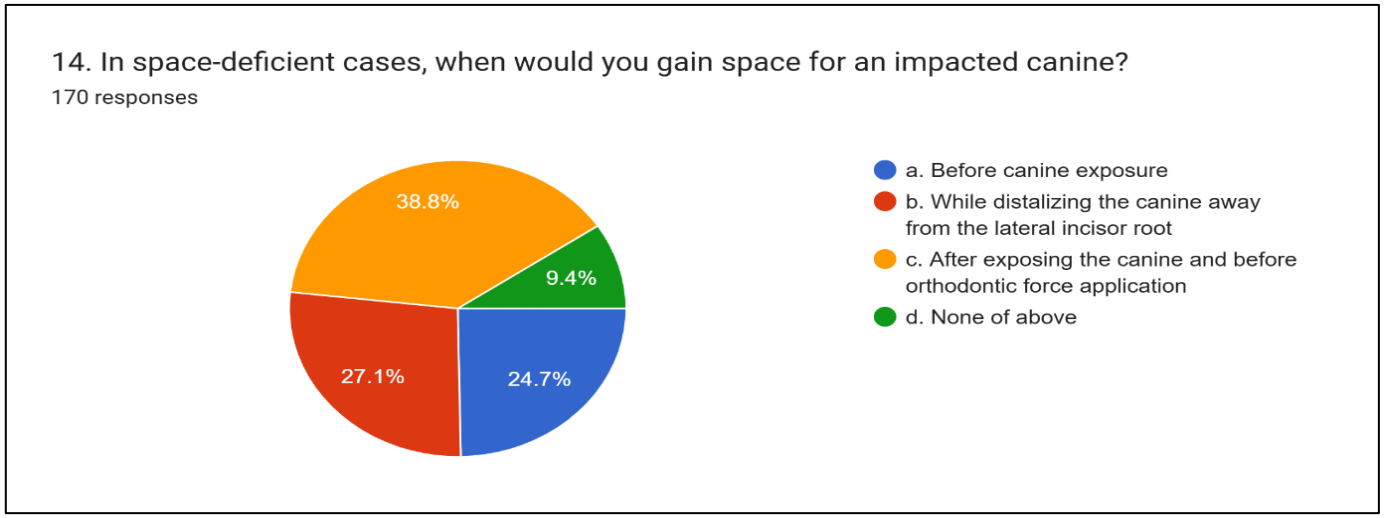


ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886

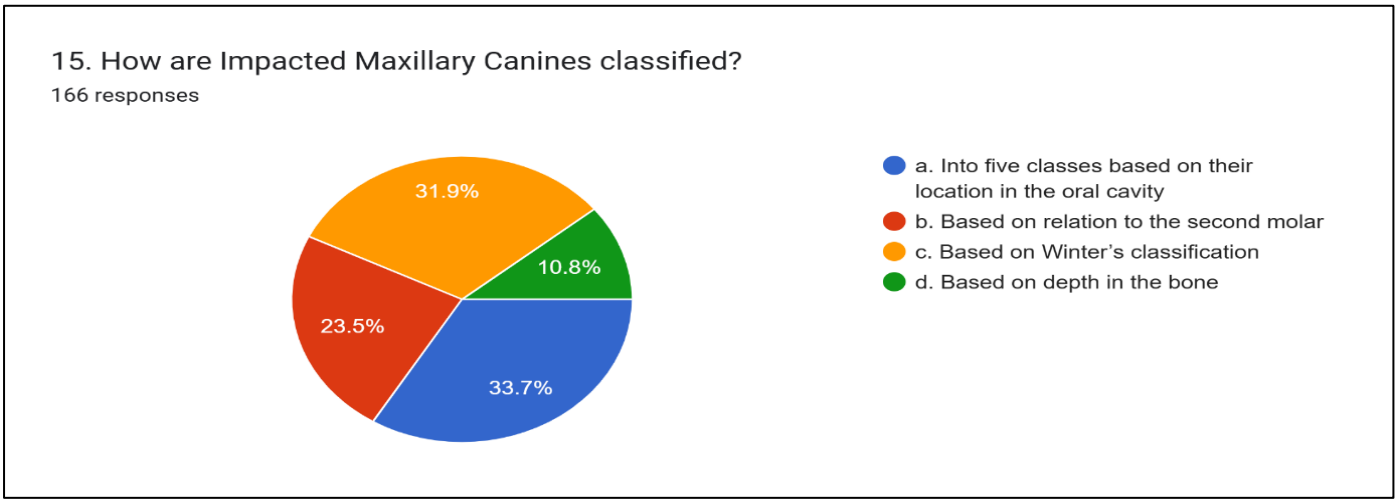
47% of people agreed that extraction of primary canine as an interceptive method reduced the chances of canine impaction, 38% had no opinion and 14% disagreed to interceptive treatment




38% said Exposing the canine before orthodontic force application would gain space for impacted canines, 27% said distalizing the canine away from the lateral incisor root will create space and 24% claimed space is gained before exposure of canines.

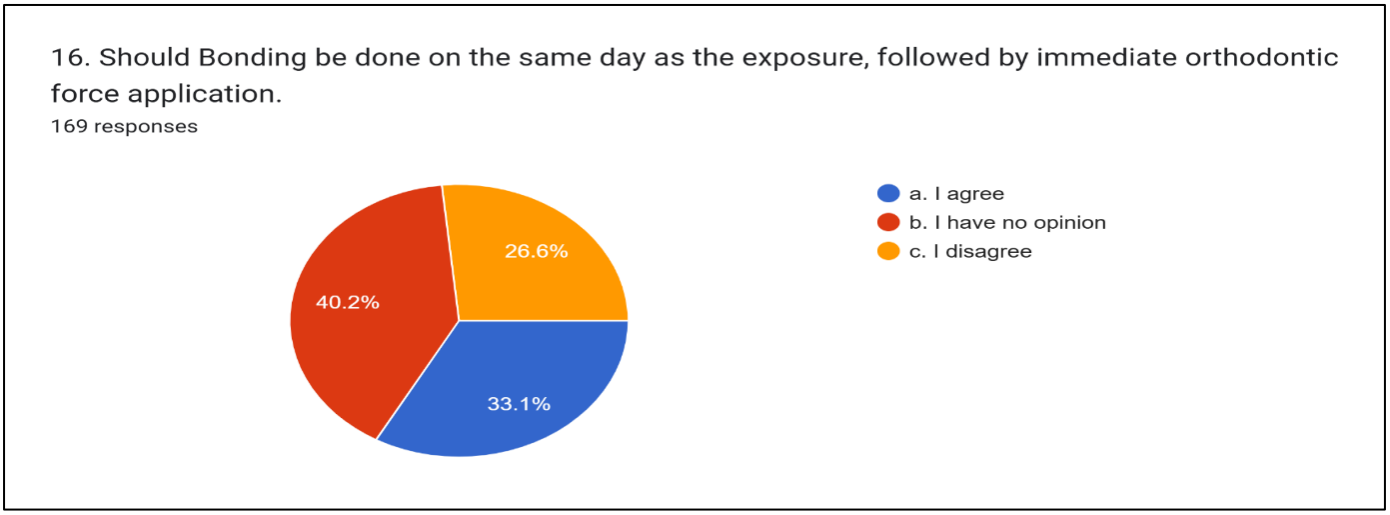



33% said Impacted maxillary canines are classified into 5 types based on their location in the oral cavity, 31% said it was based on Winters classification 24% claimed based on relation to the second molar and 10% said based on depth in the bone

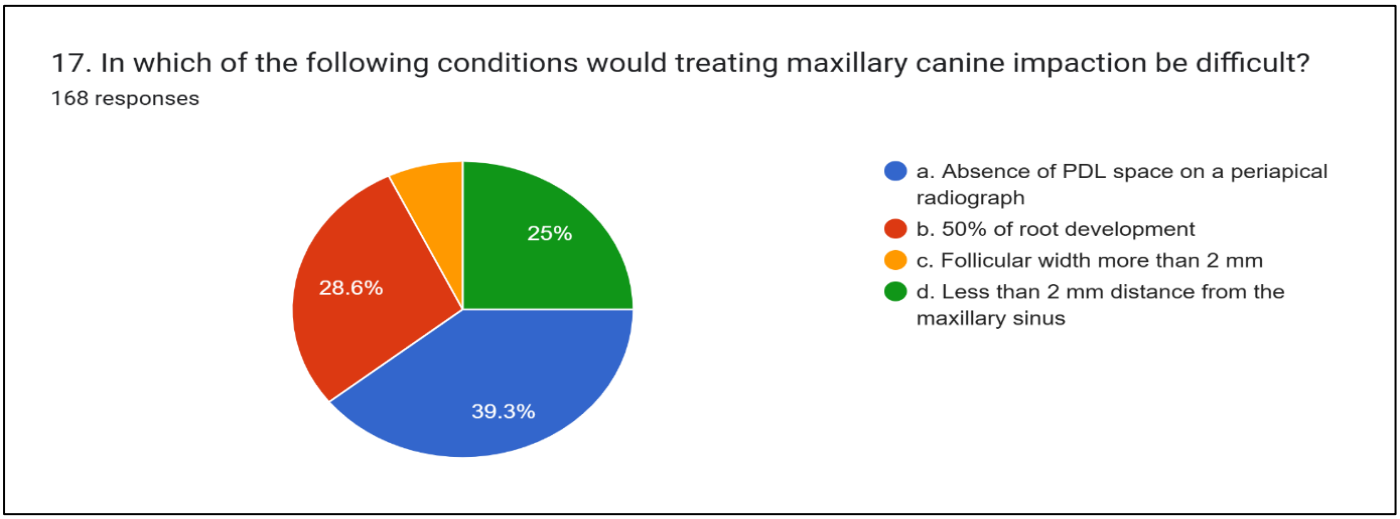


ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886

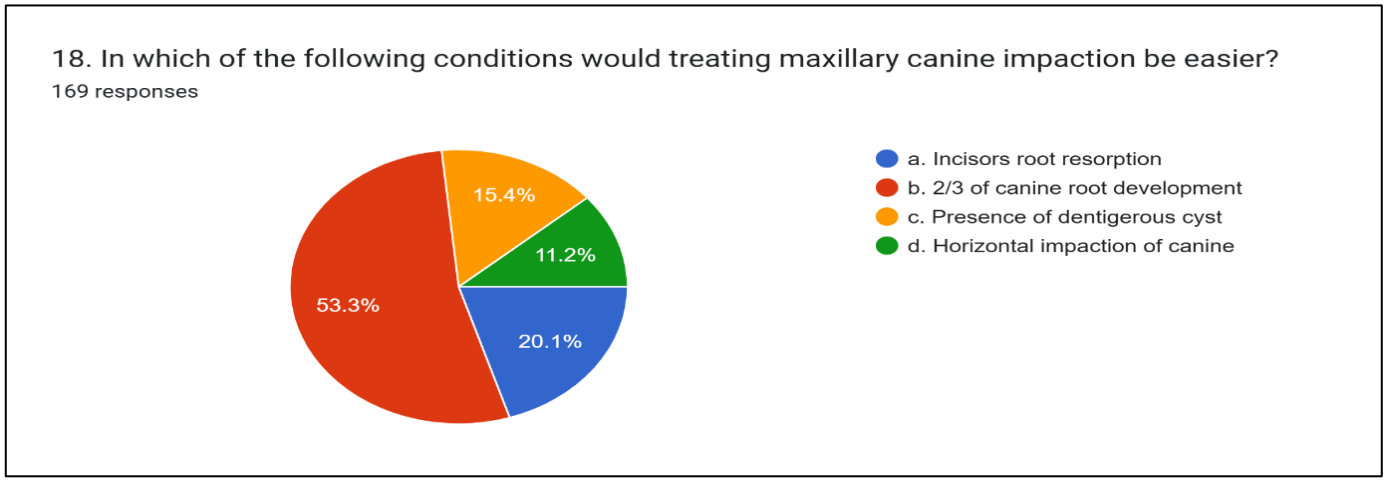
40% showed no opinion regarding Bonding should be done on the same day as exposure, followed by immediate orthodontic force application, 33% of people agreed to the procedure where as 26% disagreed.




39% said Absence of PDL space on a periapical radiograph would be difficult to treat, 29% said 50% of Root development will be difficult, 25% claimed difficulty in treating when there is less than 2mm distance from the Maxillary sinus

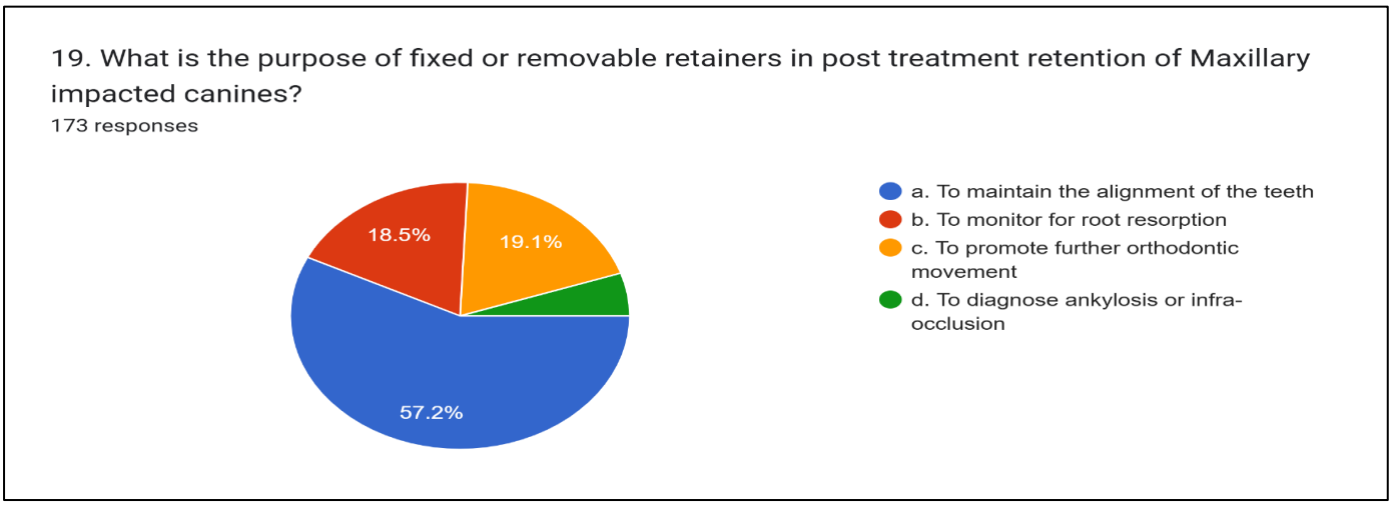



53% said 2/3rd of canine root development will be easier in treating Maxillary canine impaction, 20% said Incisor root resorption condition will be easier for treating, 15% claimed easier treatment in presence of dentigerous cyst and 11% said Horizontal impaction of canine is easier for treating



ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886

57% said the purpose of fixed or removable retainers in post treatment retention is to maintain the alignment of the teeth, 20% said it was to promote further orthodontic movement, 18% claimed to monitor for root resorption and remaining said it was to diagnose ankylosis or infra-occlusion




## IV. DISCUSSION

This study is aimed to assess the knowledge, awareness, and attitude of undergraduate dental students regarding the management of impacted maxillary canines. The findings highlight a moderate level of understanding among BDS graduates, but they also expose significant knowledge gaps in key diagnostic and clinical areas.

The eruption timing of the maxillary canine was correctly identified by 66.5% of respondents as 11–12 years, indicating that a majority of students are familiar with the normal developmental timeline of this tooth. However, the remaining third showed confusion regarding this fundamental fact, which is essential for identifying abnormal eruption patterns early.[7] When asked about the prevalence of maxillary canine impactions, student responses varied widely, with only 33.9% correctly selecting the prevalence rate of around 2–3%. This reflects a moderate awareness of epidemiological data and suggests a need for reinforced instruction in dental anomaly prevalence during undergraduate training.

Etiological understanding was also somewhat inconsistent. While 50.8% correctly identified a narrow maxillary arch as the most common cause of labial impactions, others attributed it to retention of primary canines or idiopathic factors.[8] While these factors are valid contributors, narrow arch space is widely documented as the primary cause of labial impactions.[8] This variance may result from insufficient clinical exposure to impacted canine cases, where multiple etiologies often overlap.

On a positive note, nearly half of the respondents correctly identified CBCT as the most definitive diagnostic tool for evaluating canine ankylosis, consistent with modern diagnostic protocols.[9] CBCT's ability to detect root resorption, determine tooth position, and evaluate surrounding structures with high precision makes it essential in managing complex impactions.[9] However, 28.2% still relied on conventional periapical radiography, underscoring the need for more emphasis on 3D imaging in the undergraduate curriculum.

Students showed better understanding when it came to the anatomical and clinical aspects of impaction. For instance, 64% correctly selected the **guidance theory**, stating that canines erupt along the root of the lateral incisor. Similarly, 48.9% identified **angulation of the impaction** as the most critical predictor for treatment success, aligning with literature indicating that steep angulations are associated with poor prognosis.[10] However, awareness of treatment protocols and challenges was less robust. While 43% of students recognized **insufficient space creation** as a common challenge in orthodontic management, only 38% correctly identified the optimal timing for space gaining—**after exposure and before orthodontic force application**.[11] These clinical nuances are crucial for avoiding treatment failure, especially in palatal impactions, which accounted for 38% of perceived common impaction types among respondents. The gender disparity in impaction frequency was moderately well understood, with 56% acknowledging that females are affected approximately twice as often as males. Students also demonstrated a fair grasp of potential surgical complications, such as root resorption and root fracture, with 52% recognizing multiple complications associated with surgical exposure.[12]

Notably, knowledge about interceptive treatments, such as primary canine extraction, was mixed. Although 47% agreed that this could reduce the likelihood of impaction, a substantial 38% had no opinion. This reflects uncertainty in clinical decision-making, despite strong supporting evidence for interceptive extraction when radiographic findings suggest favorable canine positioning.[12]

Finally, awareness of **post-treatment retention** was relatively strong, with 57% identifying the role of retainers in maintaining tooth alignment. This understanding is critical, as relapse is a well-documented risk following complex orthodontic treatment

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1886

## V. CONCLUSION

The results indicate that while BDS undergraduates possess a foundational understanding of impacted maxillary canines, there are clear deficiencies in applied knowledge, especially regarding diagnostic accuracy, timing of intervention, and orthodontic biomechanics. Targeted curricular enhancements—such as the inclusion of CBCT workshops, clinical case discussions, and interdisciplinary seminars—could significantly improve competence in managing this common dental anomaly.

## REFERENCES

[1]. Current Trends in Dentistry. "Assessment of maxillary canine impaction and its management."
[2]. Pocket Dentistry. "Canine impaction – A review of the prevalence, etiology, diagnosis and treatment."
[3]. PMC. "Localization of impacted maxillary canines using cone beam computed tomography. Review of the literature."
[4]. Turkish Journal of Orthodontics. "Orthodontic Localization of Impacted Canines: Review of the Cutting-edge Evidence in Diagnosis and Treatment Planning Based on 3D CBCT Images."
[5]. Prevalence of maxillary canine impaction in an Egyptian population: a retrospective study.
[6]. Prevalence of Maxillary Impacted Canine among Orthodontic Patients of Universal College of Medical Sciences, College of Dental Surgery, Bhairahawa, Nepal.
[7]. Becker A. *The orthodontic treatment of impacted teeth*. 3rd ed. Wiley-Blackwell; 2012.
[8]. Ericson S, Kurol J. Resorption of incisors after ectopic eruption of maxillary canines: a CT study. *Angle Orthod*. 2000;70(6):415–23.
[9]. Botticelli S, Verna C, Cattaneo PM. Two- vs three-dimensional imaging in subjects with impacted maxillary canines. *Eur J Orthod*. 2011;33(4):344–349.
[10]. Power SM, Short MB. An investigation into the response of palatally displaced canines to the removal of deciduous canines. *Br J Orthod*. 1993;20(3):215–223
[11]. Al-Nimri KS, Gharaibeh TM. Frequency of impacted maxillary canines and their orthodontic treatment in a university dental clinic. *BMC Res Notes*. 2014;7:637.
[12]. Kokich VG. Surgical and orthodontic management of impacted maxillary canines. *Am J Orthod Dentofacial Orthop*. 2004;126(3):278–283.