

# Anatomical positions of Impacted Wisdom teeth in the lower jaw in young patients evaluated by 3D imaging in Kirkuk city

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**Keywords:**

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**ABSTRACT**

Third molars, also known as wisdom teeth, are the most distal (posterior) of the three molars found in each quadrant of the human dentition, they usually appear between the ages of 17 and 25 years. Third molars should ideally erupt and be properly aligned with the rest of the teeth. However, these third molars are frequently misaligned, which can result in crowding of the teeth, damage to adjacent teeth, and, in rare cases, cystic pathology or root resorption. To describe the incidence of impaction of wisdom teeth in young patients in Kirkuk city, and study the different anatomical positions of wisdom teeth also architectural histology of wisdom teeth. Fifty patients with impacted wisdom teeth in the lower arch, with ages ranging from (17–25) years were taken from dental specialized centers and from private clinics in Kirkuk city during the period from November 2021 to February 2022. Informed permission was obtained from the Kirkuk health directorate to perform this study. All the patients with impaction are included in rage age, and above the age of 25 years were excluded from this study. After taking a CBCT for the patient, evaluation of the impacted wisdom teeth begin for all the cases which were 50 cases, firstly determine the number of wisdom teeth impacted in the lower arch either in the left or right. The 27 of patients (54 %) were female while the male was 23 patients (46%). In all 50 samples, there were 22% of cases which is 11 patients have one wisdom tooth impacted. 78% of cases which are 39 patients of the samples with two teeth impaction. This study targets the ents between the ages (17-25) with impacted lower wisdom teeth living in Kirkuk city, Iraq. The mean age, when diagnosed, was 21.84 years old. In this study, clinical data were collected from the specialized dental center in Kirkuk, which has a policy of using DPT for all new patients with impacted 3M. 1. gender prevalence in 3M impaction are more in the female than male, vertically impaction & Mesially impacted are more percentage of impaction than other types of impactions so the majority of patients were referred for surgical removal of symptomatic impacted wisdom teeth. Horizontal impaction is less than vertical & mesial impaction, The least percent of impaction is distal impact. No transverse Buccal or lingual impaction is seen in this study. Type B (OS with the level of CEJ OF the second molar) impaction is most relevant in this study. and no histological difference was seen in this study in comparison with other studies' findings.

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## 1. INTRODUCTION

Third molars, also known as wisdom teeth, are the most distal (posterior) of the three molars found in each quadrant of the human dentition. Tooth impaction is a pathological condition in which a tooth is unable or unwilling to erupt into its normal functioning position. Dental treatment can help with this issue [1].

They usually appear between the ages of 17 and 25 years. Third molars should ideally erupt and be properly aligned with the rest of the teeth. However, these third molars are frequently misaligned, which can result in crowding of the teeth, damage to adjacent teeth, and, in rare cases, cystic pathology or root resorption [2].

Tooth impaction is one of the most common tooth position abnormalities. An impacted tooth (*dens retens*) is a tooth with a fully formed root that has completed development but is partially or completely covered by hard and/or soft tissues because it is outside of the physiological period of eruption [3].

The surgical removal of impacted wisdom teeth is a routine procedure in dental surgery. In published studies, the prevalence of impacted teeth ranged from 6.9 to 76.6 percent. Third molars are the most commonly impacted teeth, especially in the mandible. They, along with the maxillary canine and mandibular second premolar, are among the most commonly impacted teeth [4].

There are two types of third molar impaction causes: general and local [5]. The phenomenon of impaction has become more prevalent in recent decades. This trend appears to be explained by an increasing level of hygiene, as well as less frequent tooth loss and the influence of a lack of physiological tooth attrition due to dietary changes. The genetic etiology of third molar impaction is important in the odontogenesis process [6].

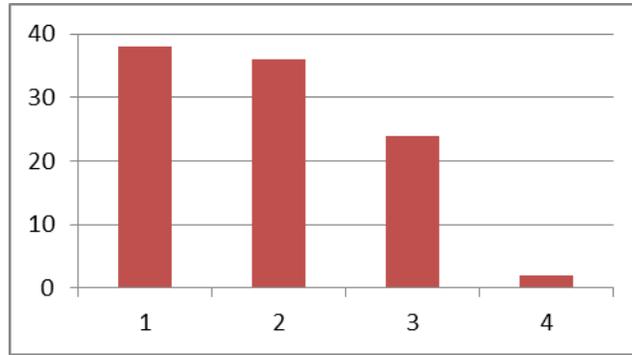
Aim of the study: The current study aims to describe the different anatomical positions of wisdom teeth also the architectural histology of wisdom teeth in the young patients in Kirkuk city.

## 2. Material and Method

Fifty patients with impacted wisdom teeth in the lower arch, with ages ranging from (17–25) years were taken from dental specialized centers and from private clinics in Kirkuk city during the period from September 2021 to March 2022. Informed permission was obtained from the Kirkuk health directorate to perform this study.

## 3. The results

The age of the samples for the females ranges from 17 to 24 and for the male's ranges from 18 to 25. The mean age for all the samples was 21.84. The 27 patients (54 %) were female while the male was 23 patients (46%). In all 50 samples, there were 22% of cases which is 11 patients have one wisdom tooth impacted. The 78% of cases are 39 patients of the samples with two teeth impaction.

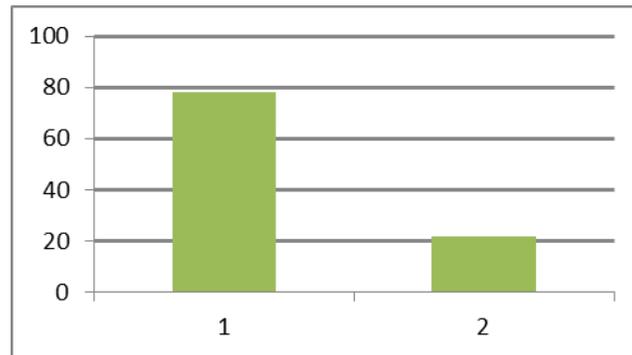


**Figure (1):** percentage of types of impaction (winter classification)

The most impacted lower wisdom teeth, it is 38% of the cases is vertically impacted wisdom teeth which are 19 patients, The second most angulated impacted lower wisdom teeth, 36% of the cases is mesially angulated which is 18 patients have mesial angulated impaction, The horizontally impacted wisdom teeth is 24 % of all the cases which is 12 of the patients.

The distal impacted wisdom teeth are 4% of all the cases which is 2 of the patients.

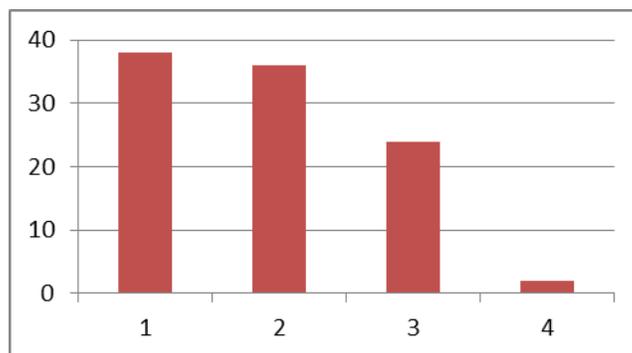
In all 50 samples, there were 22% of cases which is 11 patients have one wisdom tooth impacted. The 78% of cases were 39 patients of the samples with two teeth impaction.



**Figure (2):** the number of teeth impacted 1. two teeth impacted 2. One tooth was impacted.

Winter Classification:

There were 4 types of angulation of impacted wisdom teeth according to the winter classification. (figure 24)



**Figure (3):** percentage of types of impactions (winter classification) 1. vertical impaction Mesial impaction 3. Horizontal impaction 4. Distal impaction

The 4 types of impaction are:

**Vertical Impacted Wisdom Teeth:**

The most impacted lower wisdom teeth were 38% of the cases and were vertically impacted wisdom teeth which were 19 patients. Vertical impaction is the most widespread type of impacted wisdom teeth.

**Mesial Angulated:**

The second most angulated impacted lower wisdom teeth and formed 36% of the cases was mesially angulated which is 18 patients have mesial angulated impaction. The mesially impacted 3M is the most widespread type of angulation. the mesially impacted teeth either unilaterally or bilaterally show the unilateral and bilateral mesially angulated 3M.

**Horizontal Impacted Wisdom Teeth:**

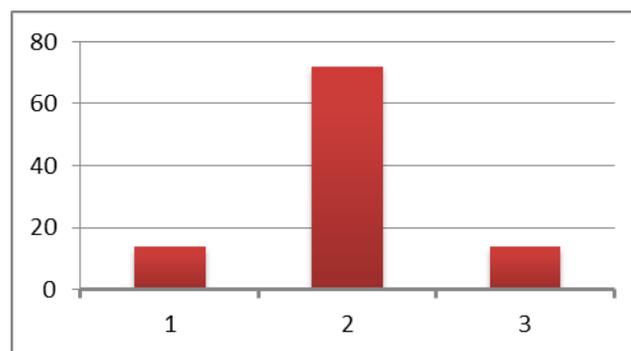
The horizontally impacted wisdom teeth formed 24 % of all the cases which was 12 patients. the horizontally impacted teeth either unilaterally or bilaterally show the unilateral and bilateral mesially angulated 3M.

**Distal Impacted Wisdom Teeth:**

The distal impacted wisdom teeth formed 4% of all the cases which was 2 of the patients. The distal impacted teeth either unilaterally or bilaterally show the unilateral and unilateral distal angulated 3M.

The level of impaction (Pell and Gregory classification):

There is three level of impaction for wisdom teeth found during the research in relation to the cervical line of the second molar tooth. According to the Pell and Gregory classification as a line drawn from the occlusal surface of the wisdom tooth to the cervical line of the second molar tooth, to see the levels of impaction (see the figure 4):



**Figure (4):** the percentage of the level of impaction 2. Type B impaction 1&3: type A & C impaction.

**Type A:** The (OS) impacted 3M above the level of the cervical line of the second molar It is percentage was 14% of all the cases which is found in seven of the patients.

**Type B:** The (OS) impacted 3M With the level of the cervical line of the second molar tooth. This level of impaction was the most prevalent of the level of impaction about 72%.

**Type C:** The (OS) is below the cervical line of the second molar Which is about 14% of all cases it is seen in seven of the impacted patients.

The 3M within the current study were described as the last teeth from the midline, and they were located distal to the second molar. Since they are situated at the mouth's end, or dental arches, this description is in

agreement with most of anatomists Foster [10].

#### 4. Discussion

This study targets patients between the ages (17-25) with impacted lower wisdom teeth living in Kirkuk city, Iraq. The mean age, when diagnosed, was 21.84 years old. In this study, clinical data were collected from the specialized dental center in Kirkuk, which has a policy of using dental panoramic tomograph for all new patients with impacted 3M.

Different classification systems were used across studies. So, it is difficult to compare the prevalence of the different angulations of impaction. Moreover, most studies measured angulation of impaction by visual impression alone [11].

The impaction incidence between the two genders was found in females are little more than in males. This finding disagrees with studies done by [12] who reported that males were more likely to have impacted teeth. This result could be due to the different growth patterns between the two genders. Females' jaw growth, for the most part, ends by the time the third molar erupts. Nevertheless, the jaw growth in males sustains during the eruption of the third molar, giving adequate space for the third molar to erupt.

In all 50 samples, there were 22% of cases which are 11 patients have one wisdom tooth impacted, and the 78% of cases which are 39 patients of the samples with two teeth impaction. The studies did previously by [13], [14] disagree with this study.

In a large sample of the population, the chances of finding one or more impacted third molar is quite high. According to [15], third molars are the most commonly impacted teeth to be found in humans.

When evaluating an impacted third molar radiographically, the angulation of the molar should be determined according to the Winter's classification. As well as the depth level in the bone, the relationship of the tooth to the Ramus of the mandible, and the second molar, should be included according to the Pell and Gregory Classification [16].

The prevalence of lower third molar impaction (3M) in this study is more in females than males, disagree with [17].

Failure of the mandibular third molar to erupt has been shown to be most affected by lack of space in the alveolar arch between the distal of the second molar and the ascending ramus. This may account for why more females presented with mesioangular impaction as mandibular growth stops in females leading to a shortage of retromolar space which is a major etiological factor of mandibular third molar impaction [18].

The percentage of soft tissue impaction was 28% while hard tissue (bony) impaction is covered with bone with a percentage of 72% of all the samples. This study agrees with [19].

The most impacted lower wisdom teeth in 38% of the cases is vertically impacted wisdom teeth. Vertical impaction is the most widespread type of impacted wisdom teeth. disagree with: [20].

The mesial impacted is the second most angulated impacted lower wisdom teeth about 36% of the cases. The mesially impacted teeth either unilaterally or bilaterally [21].

The horizontally impacted wisdom teeth are about 24 % of all impacted wisdom teeth. The horizontally impacted teeth either unilaterally or bilaterally. A study was performed in Turkey in the region of Anatolia, and that study agrees with this study which reported a high prevalence of third molar impaction in the vertical position [22]. Many studies have similar findings in international studies [23]. In some studies, the most common angulation pattern was mesioangular in the mandible [24]. The results of our current study may differ from those in the literature due to differences in methods of classifying angulation.

Studies using Winter's classification method often report higher rates of the Vertical position [25]. In addition, studies in different racial and ethnic groups have produced different results. In Bhopal, India, Saudi Arabia and the Anatolian Turkish Population, [26] and the present study, the vertical position is seen at the highest rates, while the mesioangular position is seen at higher rates in the Northeast Of Iran [27].

The use of dental panoramic tomography (DPT) for the study of impacted teeth is limited to hospital dental patients and large dental practices because of associated costs and ethical considerations [28].

A further shortcoming associated with the use of DPT for the study of impacted teeth and associated pathologies is the validity of the assessment when the radiograph is used as the only diagnostic tool. To ensure diagnostic validity in this study, radiographic findings were verified with clinical records, which were collected on standard forms as part of the routine examination process [29].

The pattern of impacted tooth types and the distribution of angulation and depth of impaction in the impacted lower third molars seen in this study is not similar to that noted by Kramer and Williams. They reported that 75% of impacted lower third molars were in mesioangular and horizontal angulation [30].

The angulation of an impacted tooth against the second molar has potential clinical implications, as outlined by [31].

For mesioangular and horizontal impacted lower third molars partially exposed in the oral cavity, their occlusal surfaces form plaque accumulative crevices against the distal surfaces of the second molars [32]. This may be clinically relevant to the present group, as more than 40% of impacted lower third molars were less than 5 mm deep in the bone. In fact, the prevalence of periodontal disease and caries in lower second molars (8.8% and 7.4%, respectively) seen in the present study is higher than the corresponding figures of 4.5% and 3%, respectively, reported by [33], [34].

The most prevalence of mandibular third molar impaction is vertical angulated with a percentage of 38% disagreeing [36] Mesioangular impaction was found to be the most common 80.9% of the impacted teeth, which may be attributed to the position of the tooth bud in the socket during tooth formation [35].

In this study, the prevalence of impaction was vertical at 38%, mesial at 36%, horizontal at 24%, and distal at 4%. The researchers presented only teeth with vertical impaction, mesial-angular impaction, distal-angular impaction, and displacement. The frequency of impaction degrees was 16%, 40%, 13%, and 1%, respectively [36], [37].

## **5. Conclusion**

1. Gender prevalence in 3M impaction is more in the female than males.
2. Vertically impaction & Mesially impacted are more percentage of impaction than other types of impaction.
3. The majority of patients were referred for surgical removal of symptomatic impacted wisdom teeth.

4. Horizontal impaction is less than vertical & mesial impaction.
5. The least percent of impaction is distally impacted.
6. No transverse Buccal or lingual impaction is seen in this study.
7. Type B (OS with the level of CEJ OF the second molar) impaction is most relevant in this study.

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