CLINICAL-STATISTICAL STUDY ON THE FREQUENCY OF WISDOM TOOTH INCLUSION PATHOLOGY

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Abstract

Including wisdom teeth is a common problem in dental practice, associated with significant complications such as gum inflammation, caries, root resorption of neighboring teeth, and cyst formation. This clinical-statistical study analyzed the frequency and distribution of wisdom tooth inclusion pathology according to age and anatomical location, within a group of 50 patients aged between 19 and 65 years, divided into five age categories. The data obtained through clinical examinations and imaging were analyzed using specialized software to correlate the clinical results with those from the plaster models made for diagnostic purposes. The results of the study show a higher frequency of wisdom tooth inclusion in the mandibular compared to the maxilla, partial inclusion being more common in the lower quadrants. Also, the incidence is highest in the 19-25 age group. Treatment options range from periodic monitoring to extraction, depending on the associated symptoms and complications. The conclusions of the study emphasize the importance of early diagnosis and careful monitoring to prevent complications and optimize the management of this common pathology.

Keywords: wisdom teeth inclusion, dental pathology, frequency of inclusion, anatomical distribution, treatment, complications.

Introduction

Wisdom teeth are the last pair of teeth to erupt, usually during late adolescence or early adulthood, between the ages of 17 and 25. This final stage of tooth eruption can cause significant problems due to the limited space available on the arch, which frequently leads to situations where wisdom teeth remain partially or completely included in the maxillary or mandibular bone [1-3].

The inclusion of wisdom teeth is a common problem in dental practice, being associated with various complications, such as gum inflammation (pericoronitis), caries, root resorption of neighboring teeth, cyst formation, and in rarer cases, the formation of odontogenic tumors. The incidence and nature of inclusion vary depending on demographic factors, such as age, gender, and anatomical location of wisdom teeth [1-3, 26-32].

In the literature, wisdom teeth inclusion is described as one of the most common dental pathologies. Studies show that the incidence of wisdom teeth inclusion is higher in the mandible than in the jaw, due to the restricted space in the posterior area of the mandible. This situation causes the wisdom teeth to have an improper position, which prevents complete eruption in the oral cavity. Also, genetic factors, such as the evolution of the size of the jaws and teeth, contribute to the increase in the incidence of

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molars included in modern populations. This phenomenon is associated with a reduction in the size of the dental arch and an increase in the space available for the teeth, which has led to an increase in the incidence of impacted molars [2-4, 33-40].

The correct diagnosis of wisdom teeth inclusion is essential for planning treatment and preventing long-term complications. Clinical examination and imaging are fundamental steps in assessing the position of wisdom teeth and identifying the associated risks. Panoramic radiography is usually the preferred method for diagnosis, as it provides a detailed view of the position of wisdom teeth, as well as bone structure and their relationship to adjacent teeth. In some cases, computed tomography can be used for a more accurate assessment of the position of the impacted molars and their proximity to anatomical structures, such as the inferior alveolar nerve, a sensitive structure of the mandible [4-7, 41-45].

The treatment of wisdom teeth inclusion depends on multiple criteria, including the degree of inclusion, the patient's age, and the symptoms present. In some cases, impacted wisdom teeth may remain asymptomatic and do not require immediate intervention. However, if they cause discomfort, inflammation, pain, recurrent infections, or negatively affect adjacent teeth, extraction becomes necessary to prevent complications [6-8].

Treatment options include periodic monitoring, prophylactic extraction, and in some cases, antibiotics to control associated infections. Currently, innovations in the dental field have allowed the introduction of alternative methods of managing inflammation and pain, including the use of controlled-release nanocapsules, which provide a prolonged effect of anti-inflammatory substances [6-9].

The inclusion of wisdom teeth not only affects oral health but can also influence the patient's quality of life, especially when complications are present. Persistent pain, discomfort, and inflammation can affect daily activities, and recurrent infections can lead to repeated antibiotics, impacting the patient's overall health. Moreover, the costs associated with the treatment of wisdom teeth inclusion can represent a financial burden, both for the patient and for the healthcare system. Therefore, careful monitoring of wisdom teeth and early identification of associated pathologies can prevent complications and reduce the need for complex interventions [8-12].

The main objective of this study is to evaluate the frequency and distribution of wisdom tooth inclusion pathology by age and anatomical location, providing an analysis of the incidence by dental quadrant and age segment.

This clinical and statistical study is carried out on a group of 50 patients aged between 19 and 65 years, divided into five age categories: 19-25 years, 26-35 years, 36-45 years, 46-55 years, and 56-65 years. By dividing the group into these segments, the aim is to identify age-related trends in the development of pathology and complications associated with wisdom teeth inclusion.

In addition to the frequency and distribution of wisdom teeth inclusion, this study also aims to analyze associated risk factors, such as dental history and overall oral health of patients. Using study models obtained by impressions of patients, all measurements are made with maximum precision, using an electric caliper and other

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measuring instruments. The data obtained are stored and analyzed with the help of dedicated software, allowing the correlation of clinical results with data from gypsum models. Thus, this study provides a detailed perspective on the relationship between the type of inclusion, the distribution in the dental quadrants, and the age of the patients [12-16].

Methodical material

The study was conducted on a group of 50 patients and 50 study models, targeting wisdom tooth pathology. The group of patients was selected based on age, ranging from 19 to 65 years old, and was divided into five age categories: 19-25 years old, 26-35 years old, 36-45 years old, 46-55 years old and 56-65 years old.

The study models were obtained by fingerprinting the 50 patients, to facilitate measurement and diagnosis as accurately as possible. All measurements were carried out with maximum precision, using the electric roller or other high-precision measuring instruments.

For the accuracy and management of the data obtained, dedicated software was used, which allowed the correlation of the results obtained from the clinical examination with the data from the plaster models made for diagnostic purposes.

The clinical examination correlated with the radiological examination, performed for diagnostic purposes, allowed the identification of pathologies associated with the impacted molars, with the intention of preventing or treating these diseases.

In cases of wisdom tooth pathology, recommended treatment options included monitoring progression, tooth extraction, antibiotic administration, and reducing inflammation through innovative methods such as the use of transdermal systems or nanocapsules with delayed-release essential oils.

Results

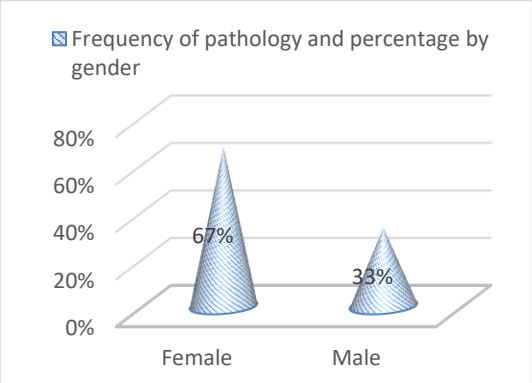


Figure 1. Gender distribution of patients with wisdom teeth disorders.

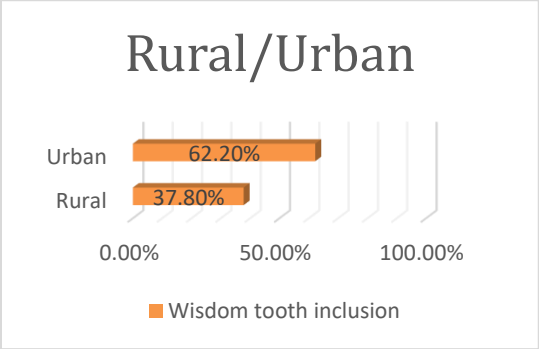


Figure 2. Distribution of patients with wisdom tooth inclusion according to the environment of origin.

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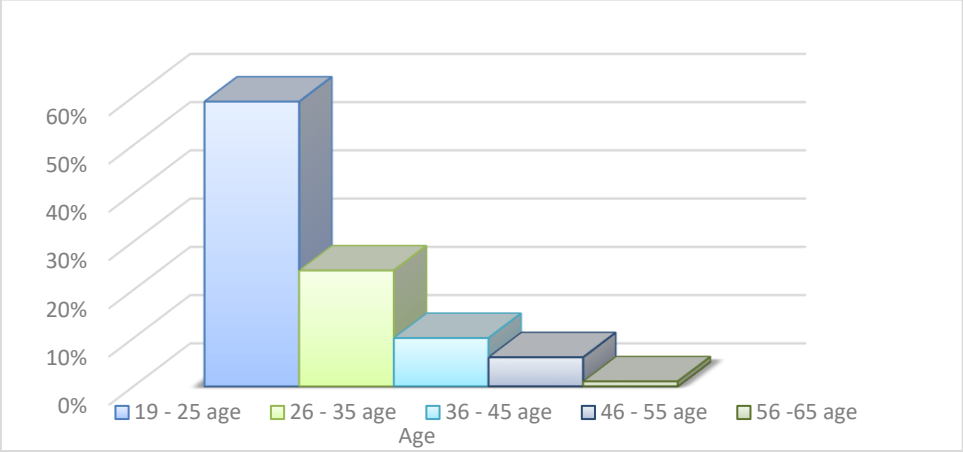


Figure 3. Distribution of dental inclusion by age categories.

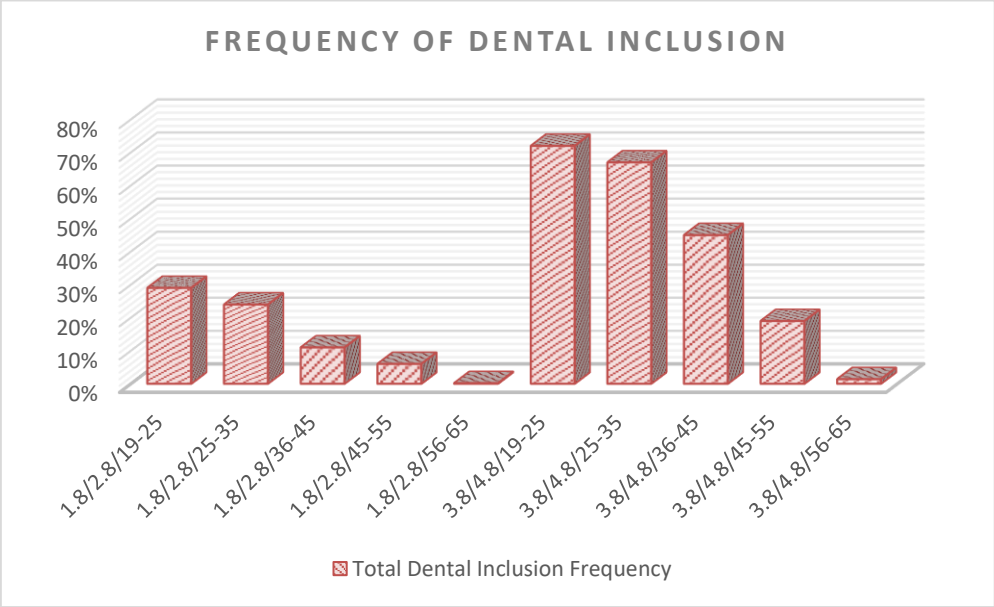


Figure 4. Incidence of total inclusion of wisdom teeth in the jaw and mandible.

Partial inclusion of wisdom teeth in the jaw/mandible	**Average values**	**Standard deviation** (p = 0.05)
1.8	16,3952	0.07993
2.8	16,3725	0,08193
3.8	57,7487	0,89235
4.8	63.7392	0.87437

Table 1. The mean value of the partial inclusion of wisdom teeth for each quadrant (I, II, III, IV - representing the distribution of wisdom teeth at the level of the jaw and mandible) and the standard deviation (μm) were calculated.

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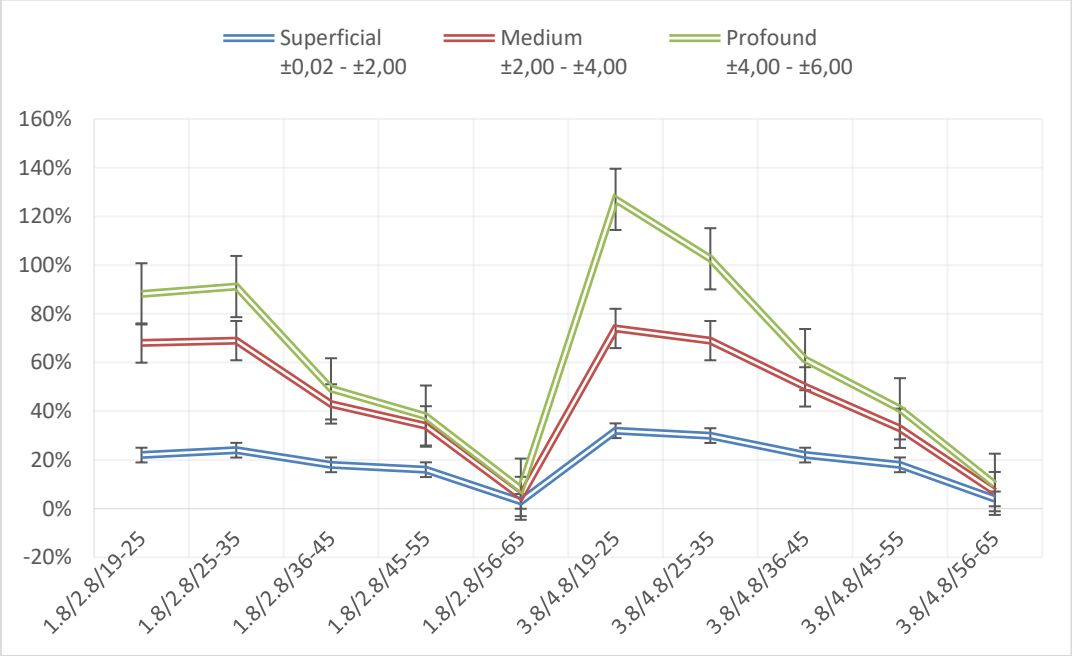


Figure 5. Results of the clinical evaluation regarding the depth of the wisdom teeth semi-included in the maxillary or mandibular bone compared to the occlusal plane (superficial, middle, or deep).

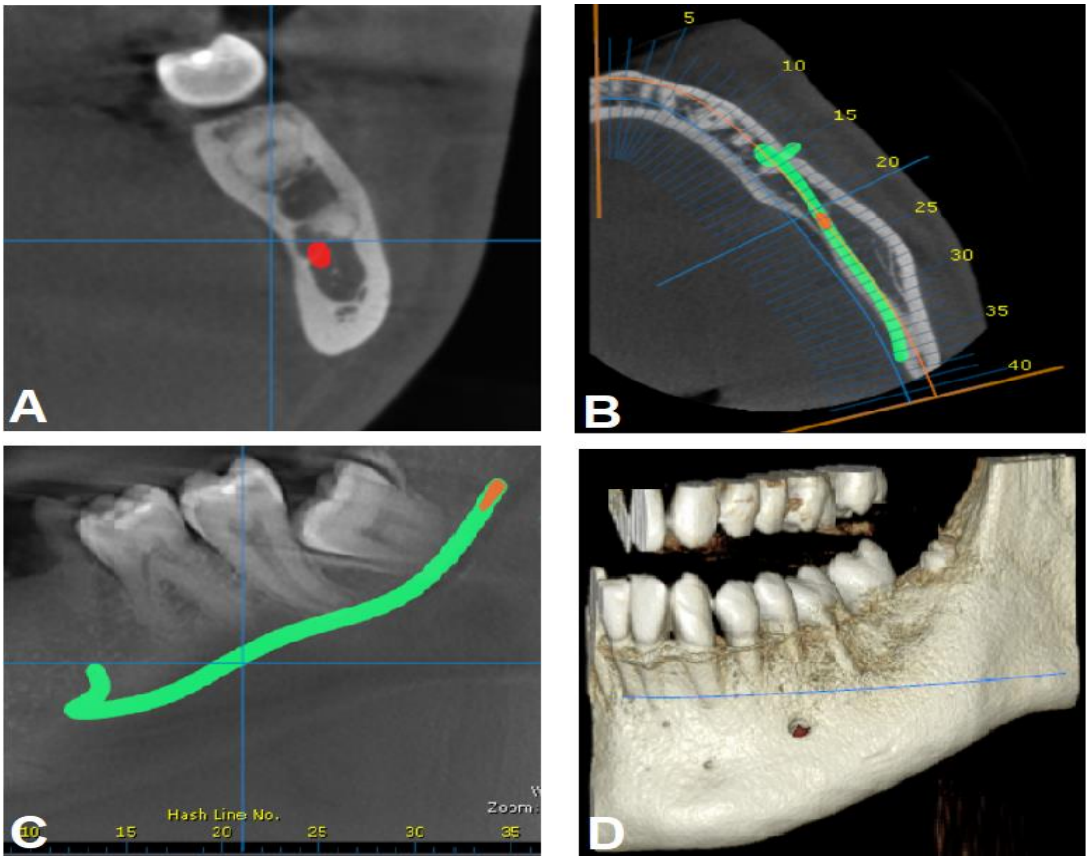


Figure 6. CBCT, A) cross-sectional view of the positioning of the mandibular nerve in zone 3.8 B) Highlighting the trajectory of the mandibular nerve at the sagittal level C) The

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relationship of the alveolar nerve canal with the semi-included third molar. D) 3D radiological image of CBCT type highlighting the situation of the degree of partial eruption.

Profundity	**Calculated value**	**Average values 1.8**	**Average values 2.8**	**Average values 3.8**	**Average values 4.8**	**Standard deviation**
Number of values	mm	50	50	50	50	<0.0001
Superficial ±0,02 - ±2,00		±0,08 - ±1,67	±0,11 - ±1,53	±0,09 - ±1,62	±0,13 - ±1,67	
Medium ±2,00 - ±4,00		±2,29 - ±3,20	±2,19 - ±3,32	±2,22 - ±3,21	±2,41 - ±3,02	
Deep ±4,00 - ±6,00		±4,08 - ±5,21	±4,32 - ±5,32	±4,23 - ±5,21	±4,09 - ±5,23	
Standard deviation		± 0.0032	± 0.0043	± 0.0032	± 0.0035	

Table 2. The results obtained from the model evaluation of the depth of the wisdom teeth semi-included in the maxillary or mandibular bone, about the occlusal plane (superficial, middle, or deep).

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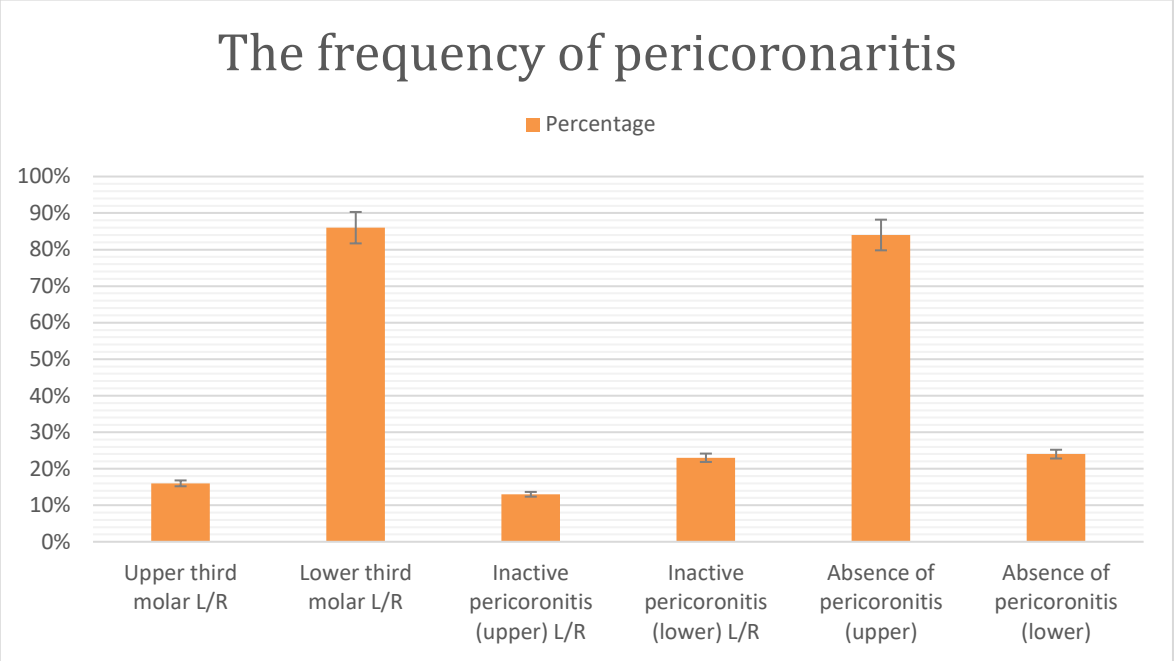


Figure 7. Frequency of dental pericoronitis at the level of the upper and lower wisdom teeth.

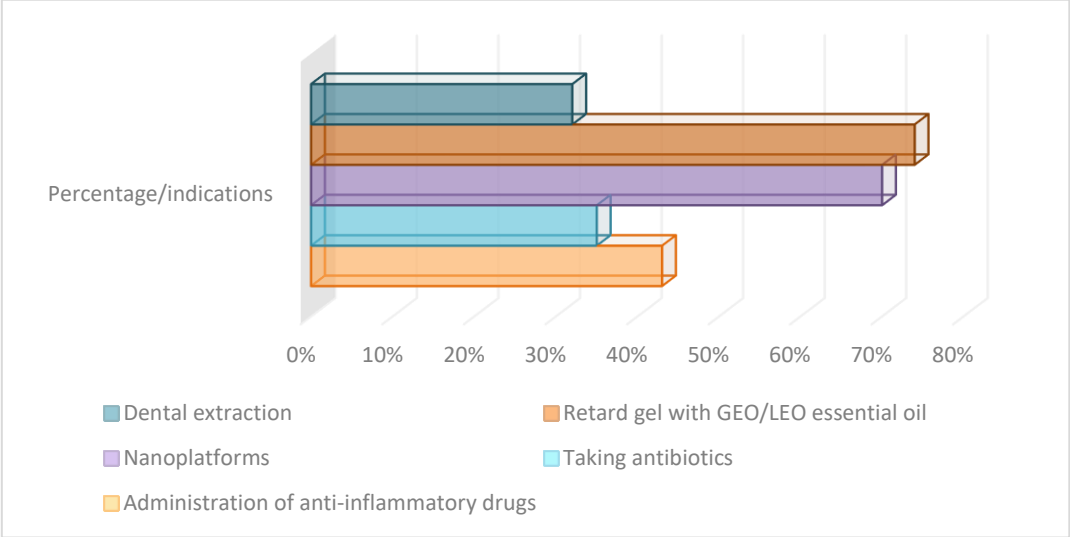


Figure 8. Indications of treatment options are recommended in cases of wisdom tooth pathology.

Discussions

Regarding the distribution of patients with impacted teeth according to sex (Figure 1), it is observed that wisdom tooth inclusion affects women more frequently, with a percentage of 67%, compared to men, who present a percentage of 33%

The maximum prevalence of dental inclusion is found in the 19-25 age group, with a frequency rate of 59% (Figure 3).

It was found that the highest inclusion rate (Figure 4) is recorded in the 3.8/4.8 category in the 19-25 age group, with a frequency of 72%, followed by the 3.8/4.8 category in the 25-35 age group, with an average of 67%, which indicates an increased rate for the lower arch.

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It can be seen that, at the upper arch (Table 1), the means are statistically similar (1.8/16.3952 and 2.8/16.3725), with a standard deviation of approximately 0.07993±0.08193 μm. At the lower arch, the means are also statistically close (3.8/57.7487 and 4.8/63.7392), with a standard deviation of about 0.89235±0.87437 μm.

It was noted that the age group 19-25 years (Figure 5) regarding the depth of wisdom teeth, for molars 3.8/4.8 presents the highest rate of inclusion compared to the occlusal plane, with a percentage of 53% for the depth of ±4.00 - ±6.00 mm. At the upper arch, the values are significantly lower.

It is observed that the standard deviation (Table 2) is significantly different ($p = 0.05/<0.0001$) for measuring the depth of semi-impacted wisdom teeth. The standard deviations were statistically similar, with a mean value of ±0.0032.

We note the increased rate of dental pericoronitis (Figure 7) at the mandibular level, with a proportion of 86%, compared to the upper arch, where the percentage is approximately 16%.

Indications for recommended treatment options in cases of wisdom tooth pathology show that the use of retard gel with lavender and geranium essential oils is recommended in 74% of cases, followed by nanoplatforms with a rate of 70%.

The inclusion of wisdom teeth is a common pathology, which requires special attention due to the many possible complications. The depth at which they are located in the maxillary or mandibular bone, whether superficial, medium, or deep, can significantly influence the therapeutic approach and the decision to extract. This assessment is crucial not only to determine the degree of inclusion, but also to assess the associated risks, such as damage to neighboring teeth, risk of infection, and pain [17-20].

In the present study, model-based assessment of the depth of semi-impacted molars relative to the occlusal plane allows for more accurate measurement of wisdom tooth position, which can improve diagnostic accuracy and treatment planning. The results indicated that deep inclusion is more often associated with severe complications, including dental cysts and root damage to adjacent teeth. Thus, in cases of deep inclusion, extraction often becomes the only viable option to prevent long-term problems [18-21].

The literature supports these observations, suggesting that deep inclusion at the mandibular level poses the greatest risk of complications because the mandible has limited space in the posterior area, favoring tooth retention and the difficulty of full eruption. Studies also show that deep inclusion tends to be more difficult to treat, being associated with a higher risk of damage to the inferior alveolar nerve, which can lead to temporary or permanent paresthesias after extraction [19-21].

Medium and superficial inclusion, although less problematic, can still generate complications, especially gum inflammation and recurrent infections. In such cases, treatment depends on the patient's symptoms and preferences. Sometimes, regular monitoring and rigorous oral hygiene can prevent complications by allowing wisdom teeth to be preserved in asymptomatic cases [21-24].

Model-based assessment of depth of inclusion is a valuable method in dental practice, providing detailed information essential for therapeutic decision-making.

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Regular monitoring, early diagnosis, and personalized therapeutic approaches are essential to prevent complications and ensure effective management of impacted wisdom teeth [21-25].

Conclusions

Wisdom tooth inclusion is a complex issue that requires a detailed clinical and statistical approach to identify risk factors and optimize the treatment of affected patients. Early monitoring and intervention are essential to prevent associated complications and reduce the need for complex surgeries. This clinical-statistical study contributes to understanding the frequency and distribution of wisdom tooth inclusion, providing a solid basis for treatment planning and guiding clinical decisions in the management of this pathology.

Dental wisdom teeth affect women more frequently and are most often found in younger age groups, with maximum prevalence between 19-25 years of age, and the frequency decreases considerably with age.

Impacted wisdom teeth are more common in the mandible than in the maxilla, and inclusion in the lower arch tends to be deeper and more frequently associated with complications, such as pericoronitis, compared to the upper arch.

CBCT and OPG are essential in assessing wisdom tooth inclusion. They provide detailed information about the tooth's position and relationship to neighboring anatomical structures, thus facilitating accurate diagnosis and correct treatment planning to prevent complications.

The recommended treatment for wisdom tooth pathology includes priority retardant gels with essential oils (lavender and geranium) and nanoplatforms, followed by the use of anti-inflammatories and antibiotics; Surgical extraction is indicated in a smaller percentage but remains an option for complex cases.

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