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Prevalence Of Pathologies Associated With Lower Third Molar Impaction - A Radiographic Study

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ABSTRACT

Introduction: The incidence of impacted mandibular third molars varies between different populations, and their removal remains a controversial issue. According to National Institute of Clinical experience (NICE) guidelines , well defined criteria for removal of third molar were unrestorable caries , periapical pathologies , infection , disease of the follicle , cyst or tumors. The outcomes of this research will offer significant insights to dental practitioners and individuals about the possible advantages and drawbacks of retaining or extracting impacted lower third molars

Materials And Methods: In this retrospective study, 11,000 panoramic radiographs of patients who visited Saveetha dental college between December 2020 and January 2022 were analyzed. The study focused on radiographic lesions associated with impacted mandibular third molars, including caries in the third molar and adjacent tooth, pericoronal and periapical radiolucencies around impacted lower third molars, and odontomes. The exclusion criteria included patients under 20 years of age, those with a history of pathology or trauma, and syndromic patients.

Results: Among 11,000 panoramic radiographs evaluated, 14,847 impacted mandibular third molars were found. The prevalence of pathologies associated with mandibular third molars were caries (46.5%), pericoronal radiolucencies (32.7%), periapical radiolucencies (12.6%), cyst and tumors (6.9%).The study also found that the prevalence of pathologies associated with mandibular third molars increased with age, and males were more affected than females.

Conclusion: In conclusion, this study provides valuable information on the prevalence of pathologies associated with lower third molars, which can aid in decision-making regarding the management of impacted third molars. Additionally, the results highlight the importance of regular dental check-ups and radiographic examinations to monitor the development of pathologies associated with mandibular third molars.Hence, based on the high incidence of pathology related to mandibular third molars, prophylactic extraction can be considered as a viable option.

Keywords: *Cyst and Tumors, Impaction, Periapical radiolucencies, Dental, Age*

INTRODUCTION

The mandibular third molar, commonly known as the wisdom tooth, is the last tooth to erupt in the oral cavity, typically between the ages of 17-25 years. However, these teeth can become impacted, meaning they fail to fully emerge from the gum tissue and remain partially or completely below the gumline. Impacted mandibular third molars are a common finding in dental radiographs, with a prevalence of up to 38% in the general population [1][2][3]

According to National Institute of Clinical experience (NICE) guidelines, well defined criteria for removal of third molar were unrestorable caries, periapical pathologies, infection, disease of the follicle, cyst or tumors [4]. However, the decision to remove or retain an impacted third molar is often challenging and requires a thorough evaluation of the patient's clinical and radiographic findings. Over the years, literature evidence shows ongoing debate of prophylactic removal of impacted third molars. Though studies enumerate various indications for prophylactic removal of third molars, on contrary studies offer explanations against the prophylactic removal of third molar. [5]

A study by Hassan et al. [6] reported that the prevalence of impacted mandibular third molars was 39.5% in a Saudi Arabian population. Another study by Marqués et al [7] reported that the prevalence of pathologies associated with impacted mandibular third molars was 22.2% in a Spanish population. These studies highlight the need for a comprehensive evaluation of impacted mandibular third molars and the associated pathologies in different populations.

The aim of this study is to evaluate the prevalence of pathologies associated with lower third molar impactions in a sample of patients who visited Saveetha dental college. The study will focus on caries, pericoronal and periapical radiolucencies, odontomes, cysts, and tumors, and will take into account patient age and sex. The results of this study will provide valuable information to clinicians and patients regarding the potential risks and benefits of retaining or removing impacted lower third molars.

MATERIALS AND METHODS

In the present investigation, a retrospective analysis was carried out using panoramic radiographs of patients who had visited Saveetha dental college from December 2020 to January 2022. A total of 11,000 panoramic radiographs were scrutinized for age group, gender and radiographic lesions associated with impacted mandibular third molar. Only impacted third molars, which were completely or partially covered with bone and located below the occlusal plane, were included in the study. Radiographic lesions that were assessed included caries in the third molar and adjacent tooth, pericoronal and periapical radiolucencies surrounding the impacted lower third molar and odontomes. Whenever more than one lesion was detected in a particular impacted tooth, each lesion was recorded separately. Radiographic lesions were confirmed histopathologically and categorized into cysts, tumors or chronic inflammation. The study excluded patients under 20 years of age, those with previous history of pathology or trauma and syndromic patients.

RESULTS

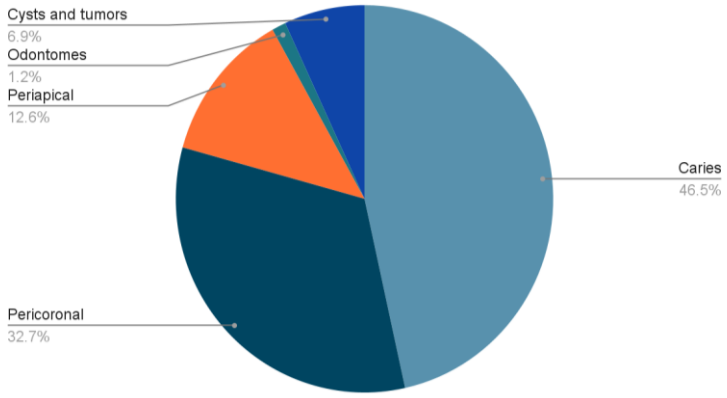
Among 11,000 panoramic radiographs evaluated, 14,847 impacted mandibular third molars were found out of which 5329 were men and 4,188 were women. The most common pathology associated with mandibular third molar were

caries followed by pericoronal radiolucencies and periapical radiolucencies.

Among the cysts, the most common type was the dentigerous cyst, followed by the radicular cyst. Among the tumors, the most common type was the ameloblastoma, followed by the odontogenic keratocyst. The study also found that the prevalence of pathologies associated with mandibular third molars increased with age, and males were more affected than females. The prevalence of pathologies associated with mandibular third molars was higher in patients with poor oral hygiene and in those with impacted third molars in close proximity to the second molars.

TABLE 1 : This table depicts the percentage of pathologies associated with the mandibular impacted tooth.

Pathology	Prevalence
Caries	46.5%
Pericoronal radiolucencies	32.7%
Periapical radiolucencies	12.6%
Odontomes	1.2%
Cysts and tumors	6.9%



GRAPH 1: A pie chart depicting the most common pathologies occurring in relation to impacted mandibular third molar.

FIGURE 1 : This image depicts multiple lesions associated with mandibular impacted third molar.

DISCUSSION

Several studies have evaluated the prevalence of pathologies associated with lower third molar impactions (Shruthi et al, 2020). In clinical practice, OPG is a valuable tool for the identification and diagnosis of impacted teeth [8]. However, the results of these studies have been variable and dependent on factors such as patient

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age, sex, oral hygiene, and proximity of the impacted tooth to the second molar.[9] A better understanding of the prevalence and types of pathologies associated with lower third molar impactions can help clinicians make more informed decisions about whether to remove or retain the tooth. The most common pathology that was associated with impacted mandibular third molar was caries. This finding is consistent with previous studies that have reported caries as the most common pathology associated with mandibular third molars. The high prevalence of caries can be attributed to the difficulty in maintaining proper oral hygiene in the third molar region, as well as the anatomical configuration of the tooth, which makes it difficult to access for cleaning (Krishnan et al, 2020)

Pericoronal radiolucencies are commonly associated with impacted third molars, and can be caused by inflammation of the soft tissue surrounding the tooth, infection, or pressure from the tooth on the surrounding bone. According to literature, since third molars are last to erupt in the oral cavity, the presence of the dental follicle has a transformation potency into cyst or tumor. In a study conducted by Dachi et al, reported high incidence of cyst associated with impacted third molars (11%) [10]. Odontomes are benign tumors that are composed of dental tissue, and can be either compound or complex. They are typically asymptomatic, but can cause problems if they interfere with the eruption of other teeth or cause pressure on the surrounding tissues.Cysts and tumors are typically asymptomatic in the early stages and may go unnoticed unless they grow in size or cause other symptoms such as pain, swelling, or numbness

According to recent research, the extraction of mandibular third molars may be considered a viable orthodontic intervention as there appears to be a positive association between the presence of mandibular third molars and crowding of mandibular incisors.[11].In addition to the clinical factors, it is essential to take into account the patient's fear or anxiety towards dental extraction, as this can impact the success of third molar removal and increase the likelihood of associated pathologies [12][13][14,15]. Another factor impacting the postoperative success of removal of third molar is suturing and wound healing [16] [17]. Closure was done in layers using Polygalactin and nylon sutures. Recently, antimicrobial silver nanoparticles coated suture materials have been proved effective in reducing toxic effects of pathogenic organisms [18][19][20]

Limitations of this study include the retrospective design and the reliance on radiographic findings. Further studies are needed to investigate the long-term outcomes of prophylactic removal of impacted third molars and to develop guidelines for the management of pathologies associated with mandibular third molars.

CONCLUSION

In conclusion, this study provides valuable information on the prevalence of pathologies associated with lower third molars, which can aid in decision-making regarding the management of impacted third molars. Hence, considering the elevated occurrence of pathology related to mandibular third molars, prophylactic extraction can be considered as a viable option. Further studies are needed to investigate the long-term outcomes of prophylactic removal of impacted third molars and to develop guidelines for the management of pathologies associated with mandibular third molars. Additionally, the results highlight the importance of regular dental check-ups and radiographic examinations to monitor the development of pathologies associated with mandibular third molars.

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