

# FREQUENCY OF COMMON PATHOLOGIES ASSOCIATED WITH IMPACTED MANDIBULAR THIRD MOLARS TEETH

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## ABSTRACT

*Teeth that fail to erupt within the dental arch due to any hindrance in its path of eruption whether it is a soft tissue lesion or any bony lesion that is causing hindrance are called impacted teeth. Mandibular third molar tooth is usually the last tooth to erupt in the oral cavity. The pathological changes associated with the impacted 3rd molar are cystic changes which include Dentigerous cysts, Odontogenic keratocyst and Calcifying Odontogenic cyst. Ameloblastoma, Myxoma and Odontogenic fibroma are the commonest neoplasms. Soft tissue pathological changes are hyperplasia's, inflammation and calcification are the common findings around the impacted 3rd molar teeth. The present study is a descriptive retrospective study conducted to evaluate the frequency of pathological changes associated with impacted 3rd molar. The most common age group amongst these patients was second and third decade of life. The male to female ratio of these patients was 1: 1.86. Age range was 17 to 50 years, mean age of 24.16 SD + 7.05. The present study will help to support the prophylactic removal of impacted 3rd molar as some of these pathological changes may be life threatening.*

**Key Words:** Khyber College of Dentistry, Third molar, Wisdom teeth, Impaction, Odontogenic cysts and Odontogenic tumours.

## INTRODUCTION

Teeth that fail to erupt within the dental arch due to any hindrance in their path of eruption whether it be a bony lesion or soft tissue are known as impacted teeth.<sup>1</sup> The development and eruption of the 3<sup>rd</sup> molar is the last tooth in the permanent dentition in the oral cavity.<sup>2</sup> Other hindrances such as malposed teeth, lack of space can alter their eruption and make the teeth impacted.<sup>3</sup> The age range of the 3<sup>rd</sup> molars to erupt is between 16-24 years and the mean age is 17 years.<sup>4</sup> Impactions are equally common in both Males and females.<sup>5</sup>

3<sup>rd</sup> molar extraction is a minor surgical procedure, a lot of research has been done on the prophylactic removal or retention of the impacted teeth. Some studies show a more conservative approach while others show a more interventional approach to the removal of 3<sup>rd</sup> molar teeth. Some studies suggest that prophylactically removing an impacted 3<sup>rd</sup> molar will reduce the chances of any pathological changes taking place around the

impacted tooth<sup>6</sup>, while others studies favour conservative approach and suggest to wait for the pathologies to take place and then remove the tooth accordingly.<sup>7</sup> According to winters 1962 classification 3<sup>rd</sup> molars are categorized into mesioangular, disto angular, vertical and horizontal.<sup>8</sup>

3<sup>rd</sup> molar impactions are also classified into either soft tissue or bony impaction and depending upon the site of impaction whether it is mandible or maxilla. The pathological changes associated with the impacted 3<sup>rd</sup> molar are cystic changes which include Dentigerous cysts, Odontogenic Keratocyst and Calcifying Odontogenic cyst. Ameloblastoma, Myxoma, and Odontogenic fibroma are the commonest neoplasms. Soft tissue pathological changes are hyperplasia's, inflammation and calcification are the common findings around the impacted 3<sup>rd</sup> molar teeth.<sup>9</sup>

The purpose of the present study was to determine the frequency of common pathologies associated with impacted mandibular 3<sup>rd</sup> molars.

## METHODOLOGY

This retrospective study was conducted in the department of oral and maxillofacial surgery over a period of 2 years after taking approval from the hospital review board. The study duration was of 2 years that is from July 2015 to August 2017.

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The study population was taken by convenience sampling technique in which the records of only those patients' were included whose teeth were fully covered with bone or partially erupted but prevented from reaching the occlusal plane. Mandibular 3<sup>rd</sup> molars fully erupted to the level of the occlusal plane were not included in the study. The records of those patients who were referred for surgical removal of the impacted mandibular 3<sup>rd</sup> molars to the oral and maxillofacial department at Khyber College of dentistry Peshawar were retrieved from the department. The type of cysts and tumors associated with the mandibular third molars were confirmed from the patients biopsy report present in the record. The pathologies were diagnosed by incisional/excisional biopsy techniques under general anesthesia. All the biopsies were previously sent to a single histopathologist to avoid pathologist bias.

## RESULTS

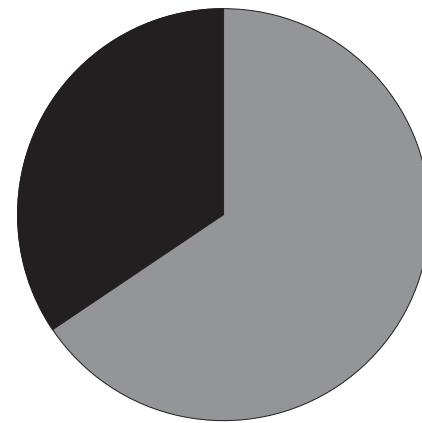
A total no of 43 patients who have pathologies associated with the impacted teeth were included in the study. The age, gender, and pathologies associated with impacted mandibular 3<sup>rd</sup> molar teeth were included in the study. Out of the total 43 patients, 28 were female and 15 were male with the male to female ratio of 1:1.86 as shown in figure 1. The age range of these patients were from 17 to 50 years with a mean age of 24.16 SD  $\pm$  7.05. The most common pathologies were Dentigerous cyst. Dentigerous cyst which was the most common pathology associated with the impacted mandibular 3<sup>rd</sup> molar 37.2%, among the cystic lesions OKC was the second most frequently occurring Pathology 30.2%, Ameloblastoma 13.9%, CEOT 6.9%, AOT 4.6%, Odontogenic myxoma 4.6%, Complex Odontome 2.3%. OKC as shown in table 1.

## DISCUSSION

An impacted tooth is the one that fails to erupt within its expected time of eruption due to physical barrier which include dental crowding, supernumery teeth, retained deciduous teeth malaligned adjacent teeth, Odontogenic cysts or Tumours. The most common impacted tooth in the oral cavity is the mandibular 3<sup>rd</sup> molar then in the descending order maxillary 3<sup>rd</sup> molar, maxillary cuspids, mandibular second premolar and supernumery teeth. The complications associated with the impacted teeth are resorbtion of adjacent roots which can make the teeth prone to caries and premature tooth loss, soft and hard tissue pathologies like Odontogenic cysts which include Dentigerous cysts, Odontogenic Keratocysts, Calcifying Odontogenic cyst, and the most common tumours are the Ameloblastoma, Calcifying epithelial Odontogenic tumour and Adenomatoid Odontogenic tumour.<sup>10,11</sup>

The occurrence of cysts and tumours associated

Gender Distribution



■ Female ■ Male

Figure 1: Gender distribution of patients associated with impacted mandibular third molar.

TABLE 1: FREQUENCY OF PATHOLOGICAL LESIONS ASSOCIATED WITH IMPACTED MANDIBULAR 3RD MOLAR

s.no	Common pathologies cysts/ tumours	No of patients	percent-age
1.	Dentigerous cyst	16	37.2%
2.	OKC	13	30.2%
3.	Ameloblastoma	6	13.9%
4.	CEOT	3	6.9%
5.	AOT	2	4.6%
6.	odontogenic myxoma	2	4.6%
7.	Complex odontome	1	2.3%
	Total	43	100%

with the impacted mandibular molars are mostly by chance radiographic findings in most of the cases as these lesions are often with no signs and symptoms and very rarely there is pain and swelling and disturbances in function in these cases. Most of the studies done so far on the development of cysts and tumours which are associated with mandibular impacted 3<sup>rd</sup> molars are mostly radiographic findings which are either usually cross-sectional or retrospective studies.<sup>12</sup>

The gold standard of the disease diagnosis is the histopathological findings in these cases.<sup>13</sup>

In the present study of the target populations was known patients with pathologies associated with impacted mandibular 3<sup>rd</sup> molars. Most of the decisions

taken by the oral & maxillofacial surgeons to remove the impacted mandibular teeth are done by clinical judgment rather than submitting the biopsies to the histopathology laboratories because most of the surgeons discard the pericoronal tissue along with the extracted impacted teeth and do not send them to the laboratories for diagnosis, that is why the data concerning the pathological changes associated with such teeth are limited.

The definition of cystic lesions are difficult to interpret as in the follicular cysts. The pericoronal radiolucency of the cyst showing greater than 2.5 cm diameter will give a false-positive diagnostic result which was a diagnostic criteria believed by Stephen et al.<sup>14</sup>. The frequency of cysts and tumours occurring in association with impacted mandibular 3<sup>rd</sup> molars vary differentially in various studies.

Most of the pathologies associated with impacted mandibular molars are cysts and tumours and the most common cyst were Dentigerous cysts. A Dentigerous cyst is a developmental Odontogenic cyst derived from the reduced enamel epithelium of the tooth forming organ and associated with the crown of an unerupted tooth. Histologically the Dentigerous cyst is lined by non-keratinized stratified squamous epithelium and the cavity is filled by fluid or semisolid contents. Differentiation, Growth and Degeneration take place within and around the cyst and expand rapidly which can cause pathological fracture of the jaw if not treated. Radiographically it appears as a unilocular radiolucency and are most commonly located with the mandibular 3<sup>rd</sup> molar teeth.<sup>15</sup>

In the present study the frequency of Dentigerous cysts associated with impacted mandibular 3<sup>rd</sup> molar was 37.2 % and OKC 30.2% which was shown more or less the same as compared to the previous studies which showed that the histological finding of dangerous cysts were 34% & 46.5% respectively.<sup>16,17,18</sup>

Ameloblastomas constitute 10% of the Odontogenic tumour, These are benign neoplasms and are locally aggressive and slow growing neoplasms and infiltrative, there is equal male to female predilection with an age range of 20-40 years. Ameloblastoma are classified as either intraosseous and extraosseous. Histologically the most common variants are follicular and plexiform and the others are Acanthomatous, Desmoplastic, Granular cell layer Basal cell and Clear cell variants.<sup>19</sup>

The frequency of Ameloblastoma associated with impacted mandibular 3<sup>rd</sup> molar was reported in Weir et al 2%<sup>20</sup>, Regezi et al 0.14%<sup>21</sup>, Statthopolos .27%<sup>22</sup>. In this study the frequency of Ameloblastoma associated with impacted mandibular 3<sup>rd</sup> molar was 13.9 %. Previous studies done on impacted teeth show that

the occurrence of cystic changes are more as compared to tumours, figures show that Gulsen et al reported 23%<sup>23</sup>, Glosser % Campell reported 37%<sup>24</sup> and Bykul et al reported 50%<sup>25</sup> cystic changes as compared to Odontogenic tumours which was also more or less the same in this study i.e. 13.9%.

The frequency of Odontogenic Myxoma in this study was 4.6 % as compared to the previous study which showed 4.3%<sup>26</sup>. Complex Odontome was found in 2.4 % of cases in this study. According to Oliveriva et al Compound Odontome comprise 9% -37% of cases and complex Odontome 5%-30%.<sup>27</sup> Odontomes are slow growing, asymptomatic with limited growth and change into complex Odontome which are associated with permanent unerupted mandibular teeth. These lesions have radiopaque mineralized structures with a radiolucent halo.<sup>28</sup>

The cysts and tumours do develop with impacted mandibular 3<sup>rd</sup> molars as reported by the literature as is also shown in the previous studies mentioned. The frequency of the cysts and tumours occurring around the impacted mandibular 3<sup>rd</sup> molars is less but its risk should not be neglected that is why when the treatment is given to such patients the pros and cons should be discussed first whether to remove the tooth and thorough investigation is necessary which includes sending the tissue with the impacted tooth for biopsy to exclude any pathologies.

In the present study it has been reported that the cysts and neoplastic changes are taking place in its development and because of these neoplastic and preneoplastic (cystic) changes early curative measures should be taken to avoid any complication for the wellbeing of the patient. Morbidity and mortality has been reported with some of these pathologies so timely diagnosis is of paramount importance to avoid such consequences.

## CONCLUSIONS AND RECOMMENDATIONS.

Dentigerous cysts and Ameloblastomas are the most common pathologies associated with impacted mandibular 3<sup>rd</sup> molars. OPG at the age of 17-25 years is important because some times these pathologies are chance radiographic findings.

Early diagnosis by biopsy is important as these cysts and tumours are associated with morbidities and mortalities, because malignant transformation has been reported in long standing benign pathologies.

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### CONTRIBUTIONS BY AUTHORS

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|----------------------------|---|
| <b>1 Samrina Mohammad:</b> | Idea, Abstract, Introduction, Methodology, Discussion.      |
| <b>2 Muslim Khan:</b>      | Helped in idea, Abstract, Conclusion, Research suggestions. |
| <b>3 Khurshid Ali:</b>     | References ,literature search.                              |