

## PREDESPOSING FACTORS FOR THE INFECTION OF MANDIBULAR THIRD MOLAR

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### ABSTRACT

*Impacted mandibular third molar tooth is the most frequent tooth extracted due to diverse group of infections like pericoronitis, caries and irreversible pulpitis etc. The objective of this study was to determine the frequency of infections found with the impacted mandibular third molar regarding its different angulations (Winter's classifications). Among 100 study patients, all subjects were clinically assessed and radiographically evaluated for infections and type of angulations of lower third molar. The data collected on specially designed Performa was analyzed for variables on SPSS 10.0 version. The data obtained showed male to female ratio of 1:2.8. Fifty two percent patients presented with infection of mandibular third molar at the age of 21-25 years. The most common infection found was pericoronitis (49.0%).*

*Based on Winter's classification most of the impacted teeth were in mesioangular (46.0%). Pericoronitis was found to be common in vertical (23.0%) followed by mesioangular (15.0%), distoangular (8.0%) and horizontal angulation (3.0%). Mesioangular impactions were most commonly involved with caries (25.0%).*

**Keywords:** Mandibular third molar, infections.

### INTRODUCTION

The commonest group of patients reporting to the Oral Surgery Department is young adults seeking consultation for partially erupted infected mandibular third molar. It is also found to be the most surgically removed tooth because of infections related to it.<sup>1,2</sup>

An impacted tooth is one, which is prevented from eruption into functional position either entirely or partially by an obstruction like a tooth, bone or soft tissues.<sup>3,4</sup>

It is the most frequent tooth for extraction as 90%

of infections like pericoronitis, caries and irreversible pulpitis of mandibular third molar, distal caries of mandibular second molar, periodontal diseases, pocketing, alveolar bone loss and inflammatory cyst<sup>5,6</sup> are all associated with it.<sup>7</sup> It also causes some serious and life threatening facial space infections.<sup>8</sup>

Pericoronitis is the inflammation of pericoronal tissues around partially impacted third molar (70%) and frequently seen in vertically angulated tooth (68%) at the age of 16-30 years and more in females.<sup>9,10</sup>

Caries/pulpitis and periapical infections were second most common infection associated with mesioangular and distoangular impactions.<sup>11</sup> 10% of the impacted third molars were involved in food packing, deep pocketing and alveolar bone loss distal to second molar. Periodontal problems were common above the age of 35 years (70%) and frequently found in mesioangular impactions.<sup>12</sup>

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The pericoronal, pulpal or periapical infections of the lower third molar can spread to buccal, submandibular, sublingual, pterygomandibular and other facial spaces in 11% cases of mesioangular impactions.<sup>13</sup> The incidence of redicular cyst was found frequently with vertical or mesioangular impactions.<sup>14</sup>

It has been documented that the most common predisposing factor for all above infections is the angulation of partially impacted mandibular third molar tooth.<sup>10,11</sup>

Recorded turnover of patients coming to Khyber College of Dentistry with impacted mandibular third molars infections is about 70 patients per month. This study was done to determine the frequency of infections found in association with impacted lower third molar.

## MEHODOLOGY

Sample size was calculated through computer based software named, Sample Size determination in health studies by WHO and expected Prevalence of infection associated with impacted third molar is 85%,<sup>7,8,9</sup> sample size calculated was 100 patients for period of 6 months.

Among 100 study patients 95 were out door and 5 indoor patients. Patients with infections associated with mandibular third molars of any age group and of both genders formed the inclusion criteria. Patients with odontogenic tumors and developmental cysts associated with completely impacted mandibular third molar tooth were excluded from this study.

Informed consents were obtained from patients on specially designed Performa and demographic data were collected. Intraoral examination of impacted tooth was done and Winter's classification was used for determination of different angulations namely mesioangular, distoangular, horizontal or vertical, buccoversion or linguoversion and transversely impacted tooth.

X rays like OPG, periapical radiographs were taken to evaluate the type of angulation, degree of impaction and common type of infection related to it e.g. pericoronitis, carious lesion, periapical infection, periodontal diseases of second molar, cystic lesion etc.

Data were analyzed on SPSS version 10.0. Frequency and percentages were calculated for pericoronitis, caries, periodontitis, cyst, and angulations like mesioangular, distoangular, horizontal, vertical vice versa. The data was represented as figures and tables.

## RESULTS

Among 100 study patients, male to female ratio was 1:2.8. Fifty two percent patients reported with infection of third molar at the age of 21-25 years followed by 26-30 years (19.0%). The number of patients reduced after that the age of 40 years (3%). (Table 1)

Based on Winter's classification, most of the impacted mandibular third molar teeth were in the mesioangular position 46.0%, followed by vertical position 32%, horizontal position 13.0% and 9.0% were in distoangular position. (Table 2)

Most of the impacted mandibular teeth were extracted due to infection. The most common infections found in descending order were Pericoronitis (49.0%), distal caries of mandibular 2<sup>nd</sup> molar (27%) and caries of mandibular third molar (14%). Five percent patients developed facial space infection. Periodontitis was found in 4.0% of patients. (Table 3)

By analyzing Winter's classification system, the relation of infection pattern with different types of

TABLE 1: AGE DISTRIBUTION

Age in years	Frequency (n)	Percent
15 - 20	8	8.0
21 - 25	52	52.0
26 - 30	19	19.0
31-35	11	11.0
36-40	7	7.0
41 above	3	3.0
Total	100	100.0

TABLE 2: TYPE OF ANGULATIONS

Type of Angulations	Frequency(n)	Percent
Mesioangular	46	46.0
Distoangular	9	9.0
Horizontal	13	13.0
Vertical	32	32.0
Total	100	100.0

TABLE 3: WINTER CLASSIFICATION AND PATTERN OF INFECTION

Winter classification	Pericoronitis	Caries	Periodontitis	Fascial space infection	Redicular cyst	Total
Mesioangular	15	25	3	3	—	46
Distoangular	8	—	—	1	—	9
Horizontal	3	8	1	1	—	13
Vertical	23	8	—	—	1	32
Total	49	41	4	5	1	100

angulations of lower molar tooth showed that pericoronitis was found to be common in vertical (23.0%) followed by mesioangular (15.0%), distoangular (8.0%) and horizontal angulation (3.0%). Mesioangular impactions were most commonly involved with caries (25.0%) followed by horizontal impaction (8.0%). (Table 3)

## DISCUSSION

Third molar extraction is the most frequent procedure in the field of oral surgery. This is because molars show a high incidence of impaction and are associated with diverse infections like pericoronitis, periodontal defects, caries, inflammatory cyst etc.<sup>1,2,3,15</sup>

In this study hundred patients fulfilling the inclusion criteria were included from the OPD of the Oral Surgical unit of Khyber College of Dentistry Peshawar.

Among these 100 study patients, 78% were male and 22% were female. Similar study conducted in the USA found that 57% of the patients were males.<sup>16</sup> However, studies carried out in Pakistan<sup>17</sup>, Malaysia<sup>18</sup> and Nigeria,<sup>19</sup> 65% of females presented with infections of third molar.

Pericoronitis (49%) was most frequent infection followed by caries in impacted third molar. The studies conducted by Khwaja 3 and Ahmad 20 also have similar findings.

Analysis of the angulation based upon Winter's classification, revealed that third molar was most commonly impacted in a mesioangular (46%) followed by vertical (32%), horizontal (13%) and distoangular (9%) impactions. These values are similar to the findings of Blandeau<sup>21</sup>, Chye<sup>22</sup>, and Renton et al.<sup>23</sup> However small number of variation was there and this may be due to geographical variation related to diet. Hosein

<sup>24</sup> found smaller number of patients with mesioangular and vertically impacted third molar.

Pericoronitis was the most common infection associated vertically impacted (23%) followed by mesioangular impactions (15%). Leone et al,<sup>25</sup> also found pericoronitis is the most common cause for the extraction, with vertically impacted third molar. Similarly in the study of Ishfaq<sup>12</sup> and Rakprasitkul<sup>26</sup> also have similar findings.

Caries were more common in mesioangular impactions (25%) due to the defective contact with mandibular second molar. Ekland showed the lesser percentage (3.9%) of caries with mesioangular impaction. This may be due to metabolic and diet difference in societies. But similar results were found in a local study conducted by Ishfaq,<sup>12</sup> (26.5%) of caries.

Periodontitis occurred in 4% mesioangular impactions. Naofumi and colleagues<sup>27</sup> found 8.91% cases of periodontitis respectively to the mesioangular impacted third molar.

The pericoronal, pulpal or periapical infections of the lower third molars resulted in facial space infections more in mesioangular impactions (5%). In similar studies by Marrioni<sup>28</sup> and Ishfaq<sup>12</sup> 49% and 38.8% cases were related to facial space infections due to mesioangular third molar respectively.

Only 1% infected cysts found in vertically impacted tooth. Lysel and Rohlin,<sup>15</sup> reported the incidence of infected cyst to be less than 2% while Sphered<sup>19</sup> and Werkmiester<sup>29</sup> reported the incidence of infected cyst to be 1% and 3% respectively.

## CONCLUSION

\* Mandibular third molars are commonly impacted mesioangularly.

- \* Most common infections related to impacted mandibular third molar in descending order are pericoronitis, caries, periodontal problems, facial space infection and infected cyst.
- \* Pericoronitis and caries were most commonly found with mesioangular impactions
- \* Infected redicular cyst is the reflection of chronic infection related to vertically impacted molar.

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