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# Evaluation of Cystic Changes in the Follicle of Radiographically Normal Impacted Mandibular Third Molar in an Iranian Population

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***Abstract:*** *surgical removal of impacted mandibular third molar is a common procedure among oral surgeries. While there is no agreement on the management of asymptomatic impacted third molars, the aim of the present study was to evaluate the rate of cystic changes in the follicle of impacted teeth with radiographically normal feature. 109 patients underwent surgical removal of impacted mandibular third molars with follicular width of less than 2.5 mm in panoramic radiograph. The follicle was evaluated histopathologically to identify possible cystic alterations. The results revealed that 44 (40.4%) follicles had cystic changes. The rate of changes was higher in older patients and mesioangular/horizontal teeth. Based on the results of the present study, the high rate of cystic alteration in radiographically normal follicles indicates the indication of prophylactic removal of impacted mandibular third molars especially in older patients.*

***Keywords –*** *Cystic Changes, Dental Follicle, Impacted Tooth, Mandibular Third Molar, Panoramic Radiograph.*

## I. Introduction

One of the most common procedures in the field of oral surgery is the surgical extraction of impacted mandibular third molar [1]. While the need for removal of symptomatic wisdom tooth has been well recognized, there is no consensus on the management of asymptomatic ones [2, 3].

One of the reported criteria to evaluate the need to remove an impacted third molar is the dimension of its follicle in panoramic radiograph: the follicle width of more than 2.5 mm is assumed to posses pathological changes and should be removed [2, 4]. However, some studies have investigated the incidence of pathological alterations in dental follicles of impacted wisdom teeth with normal radiographical feature and have reported that there exists a relatively high rate of cystic changes [2, 5-8].

The aim of the present study was to investigate the incidence of pathological changes in the follicles of impacted mandibular third molars with normal radiographical feature in an Iranian population.

## II. Materials and Methods

The present study was performed at the Oral and Maxillofacial clinic of Mashhad Dental School. The study protocol was approved by the ethical committee of Mashhad University of Medical Sciences. All patients provided the signed informed consent.

### 2.1 Patient Population:

The study population consisted of patients which had been referred to the clinic for prophylactic extraction of impacted mandibular third molars from July 2013 to January 2014.

In order to be included in the study population patients had to be 18 to 30 years old, had fully impacted mandibular third molars, and had follicular width of less than 2.5 mm. Patients who had clinical symptoms or had a follicle of more than 2.5 mm width were excluded from study sample.

Assignment of follicles to normal (width less than 2.5 mm) or pathological (width more than 2.5 mm) was performed according to the maximum width of the dental follicle measured by two calibrated operators and justified with the magnification factor of graphs. In case of disagreement between two operators, the case was discussed in a session with the presence of both operators.

### 2.2 Sample Collection and Histopathological Analysis:

All patients underwent surgical extraction of the impacted tooth with the same protocol: Povidine iodine applied around the mouth, inferior alveolar nerve and long buccal nerve block performed using 2% Lidocaine + 1:80000 Epinephrine cartridges, envelope flap created, tooth sectioned with low-speed handpiece, socket irrigated with 60 ml of sterile serum, socket sutured with 3-0 silk sutures.

During the surgery dental follicle was detached from tooth with extreme caution and immediately placed in 10% formalin and then sent to the pathology laboratory of Mashhad Dental School for further analysis. The presence of stratified squamous epithelial that lining a dense fibrous connective tissue was defined as cystic changes in the follicle.

**2.3 Study Variables:**

In addition to the main variable (incidence of cystic changes in the follicle) other variables including age, gender, side of the impacted tooth, and the angular position of the impacted tooth were collected in order to evaluate their relation with cystic changes.

**2.4 Statistical Analysis:**

Data were reported using appropriate descriptive statistics (including frequency, mean, and standard deviation). To analyze the data, independent sample t test and chi-square tests were performed using SPSS software (version 11.5, Chicago, IL) with the significance level set at 0.05.

## III. Results

In the present study 109 patients (41 male and 68 female) were participated with the mean age of 23.55 ± 4.47 years old. Among the 109 extracted third molars, 78 (71.6%) were mesionangular, 19 (17.4%) horizontal, 8 (7.3%) vertical, and 4 (3.7%) distoangular.

Among the investigated follicles, 44 (40.4%) had cystic changes. According to the t-test, no significant difference was found between the mean age of patients with cystic changes (24.04 ± 5.21 yr) and other participants (23.12 ± 4.02 yr). However, significant association was found between age group and the frequency of cystic changes (Table 1).

Based on chi-square test, no significant association was found between the frequency of cystic changes and gender or side of impacted tooth (Tables 2 and 3).

No significant association was found between angular position of tooth and frequency of cystic changes (Table 4); however, the frequency of cystic changes was higher in mesioangular (42.3%) and horizontal (47.4%) teeth in comparison to vertical (12.5%) and distoangular (25%) ones.

## IV. Discussion

The management of asymptomatic impacted wisdom tooth has always been challenging for oral and maxillofacial surgeons [1]. The aim of the present study was to evaluate the frequency of cystic changes in the follicle of impacted mandibular third molars with normal radiographical feature.

We observed that a relatively high percent of the extracted teeth had cystic alterations in their follicles (40.4%). In accordance with the findings of the present study, Saravana and Subhashraj (46%) [8], Mesgarzadeh et al (53%) [7], Baykul et al (50%) [6], Adelsperger et al (34%) [2], and also Glosser and Campbell (32%) [5] reported high frequency of cystic changes in the impacted third molar follicle. However, Walli et al (23.3%) [9] and Harnet et al (15%) [10] reported lower incidence of these alterations.

In the present study, the mean age of patients with cystic changes was higher than others. In addition, the frequency of cystic changes was significantly higher in age group of 25-30 years old when compared with younger patients. In accordance with our findings, Baykul et al [6] observed that the higher percent of patients over 20 years of age had cystic changes in comparison to patients under 20 years old. Mesgarzadeh et al [7] also found significant increase in the rate of cystic changes with the increase of age. This trend reveals the role of age in initiation of follicular cystic changes in impacted third molars. The lower rate of pathosis in Harnet et al [10] study could also be explained by the fact that their study population consisted of patients between the age of 14 and 18 years old.

We observed that no significant differences between males and females according to the rate of cystic alterations. Similar to our findings, Adelsperger et al [2], Baykul et al [6], and also Glosser and Campbell [5] found no correlation between gender and cystic changes of third molar follicle.

While no significant association was observed between angular position and frequency of cystic changes, mesioangular and horizontal teeth had higher rate of pathosis. Polat et al [11] also reported that the possibility of follicular cystic changes was higher in horizontally and mesioangularly positioned impacted third molars. However, Baykul et al [6] found higher incidence of pathosis in vertically positioned teeth.

The criterion for a normal follicle was having the maximum width of less than 2.5 mm in panoramic radiograph which was similar to the studies performed by Tegginamani and Prasad [12], Glosser and Campbell [5], Saravana and Subhashraj [8], and Walli et al [9]. However, Adelsperger et al [2] and Mesgarzadeh et al [7] set the normal width of follicle at 2.0 and 3.0 mm, respectively.

We evaluated mandibular third molars due to two reasons; in previous studies it has been reported that mandibular third molars had highest rate of pathosis [5, 7, 13]. Moreover, we considered the fact that mandibular third molar is the most common impacted tooth [14, 15].

## V. Conclusion

Considering the results of the present study, high rate of cystic changes was observed in radiographically normal impacted third molars. Hence prophylactic removal of this tooth is highly recommended, especially in older patients. Moreover, the radiographic criteria of normal follicle need to be revised.

## VI. Figures and Tables

**Table1: Association between cystic changes and age group**

| Age group | Cystic changes | Normal | Total |
|---|---|---|---|
| 18-24 yr* | 15 | 35 | 50 |
| 25-30 yr* | 29 | 30 | 59 |
| Total | 44 | 65 | 109 |

*According to the chi-square test, patients with age of 25-30 years old had significantly higher risk of developing cystic changes in radiographically normal dental follicles of impacted third molars (P-value = 0.042).

**Table2: Association between cystic changes and gender**

| Gender | Cystic changes | Normal | Total |
|---|---|---|---|
| Male* | 18 | 23 | 41 |
| Female* | 26 | 42 | 68 |
| Total | 44 | 65 | 109 |

*According to the chi-square test, no significant difference was found between males and females regarding the risk of developing cystic changes in radiographically normal dental follicles of impacted third molars (P-value = 0.559).

**Table3: Association between cystic changes and side of impacted tooth**

| Side | Cystic changes | Normal | Total |
|---|---|---|---|
| Left* | 24 | 37 | 61 |
| Right* | 20 | 28 | 48 |
| Total | 44 | 65 | 109 |

*According to the chi-square test, no significant difference was found between left and right sides regarding the risk of developing cystic changes in radiographically normal dental follicles of impacted third molars (P-value = 0.806).

**Table 4: Association between cystic changes and angular position**

| Angular position | Cystic changes | Normal | Total |
|---|---|---|---|
| Mesioangular* | 33 | 45 | 78 |
| Horizontal* | 9 | 10 | 19 |
| Vertical* | 1 | 7 | 8 |
| Distoangular* | 1 | 3 | 4 |
| Total | 44 | 65 | 109 |

*According to the chi-square test, no significant association was found between angular position and cystic changes in radiographically normal dental follicles of impacted third molars (P-value = 0.322).

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