

Evaluation of impact teeth prevalence and related pathologic lesions in patients in Northern part of Iran (2014-2016)

Amir Hosein Pakravan,^a Mohammad Mehdi Nabizadeh,^b Shima Nafarzadeh,^{c*} Sina Jafari,^d Atena Shiva^e
Tahmineh Bamdadian^f

^aDepartment of Oral and Maxillofacial Surgery, Dental School, Sari University of Medical Sciences, Sari, Iran.

^bDental School, Sari University of Medical Sciences, Sari, Iran.

^cCellular and Molecular Research Center, Babol University of Medical Sciences, Babol, Iran.

^dDepartment of Prosthodontics, Dental School, University of Shahed, Tehran, Iran.

^eDepartment of Oral and Maxillofacial Pathology, Dental School, Sari University of Medical Sciences, Sari, Iran.

^fDental school, Dental school, Sari university of medical sciences, Sari, Iran.

Correspondence to Shima Nafarzadeh (email: shima.nafar2004@yahoo.com).

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Objective In this research, our purpose was to evaluate how prevalent impacted tooth is. We also evaluated the type of third molar impaction and pathologic lesions related to impacted teeth in patients referred to Sari and Babol dental school in 2014-2016.

Methods The study was cross-sectional, and was carried out on 2109 panoramic radiographs of patients with age over 20 years referring to Sari and Babol dental faculties during 2014-2016.

Results Among the patients, 392 (18.5%) presented with at least one impacted tooth. 243 women (20.6%) and 149 men (16%) had impacted teeth.

Conclusion The most common encountered impact tooth was found to be the third molar of mandible and dentigerous cyst was the most detected lesion associated with tooth impaction.

Keywords impact teeth, lesions, prevalence lesions

Introduction

Impaction is defined as a pathological condition in which the tooth by cannot erupt into the oral cavity in the appropriate time and considering physiological limits as a normal eruption process.¹ Impaction prevalence is affected by factors such as age, dental eruption timing, genetic and environmental factors. Local mechanical factors involving during the time of tooth development and eruption are critical.²⁻⁵ Many patients do not know about their impacted tooth and it is discovered during routine examinations. Therefore, it is very important to inform dental practitioners about this frequently occurring phenomenon in everyday clinical practice and to emphasize the importance of early detection and intervention to prevent possible harmful consequences⁶.

Several radiographs are available for examination of impacted teeth. Panoramic radiographs, are often the first prescribed radiographs because they can provide information about all the teeth in upper and lower jaw and the surrounding structures. The panoramic radiograph is used as the basic method in epidemic research due to its economic and practical characteristics.^{4,7} However, in many cases, a diagnosis based on 2D radiography is not sufficient, because it is very difficult to assess the buccolingual aspects of the relation between the canine crown and the roots of the incisors. The usually impacted permanent teeth are the third molars, maxillary canines or central incisors, and mandibular second premolars.^{8,9} Tooth impaction ranges from 0.8–3.6% of the general population.^{6,10} Some authors reported that third molar impaction rate is 16.7% to 68.6%.^{11,12} Carter et al. in a meta-analysis study found 24.4% worldwide third molar tooth impaction and they showed that impaction of third molars in mandible was greater than maxilla, but its prevalence was not significantly different between men or

women.⁵ Extraction of impacted third molars is controversial in dentistry.¹³ Problems seen associated to the tooth impaction varies from simple to complicated life threatening problems. Such as caries, pulp disease, periapical and periodontal disease, temporomandibular joint disorder, infection of the facial area, resorption of rooth and the adjacent tooth, and even oral and head and neck tumors. Hyperplastic dental follicle, dentigerous cyst or odontogenic keratocyst are among the most common simple problems observed in tooth impaction.^{11,13-18} For this reason, prophylactic extraction of third molar teeth is prescribed for future disease prevention. However, there is limited evidence about risk of caries and periodontitis in a second molar in adjacent place to a retained third molar.¹⁹ Most studies found that pericoronal radiolucency greater than 2.5 mm around the crown of impacted teeth is suggestive of a pathologic lesion.²⁰⁻²²

In this study we evaluated how prevalent impacted teeth are, the type of impaction of third molars and pathologic lesions related to impacted teeth in patients referred to Sari and Babol dental school during 2014-2016.

Materials and Methods

This study was a cross-sectional research and was performed on 2109 panoramic radiographs of patients with age over 20 years referring to Sari and Babol dental faculties during 2014-2016. All radiographs that were of good quality were selected regardless of the reason for prescribing, and in terms of the presence of an impact tooth, its radiographic features were reviewed by an expert oral and maxillofacial surgeon. All panoramic radiographs were taken with the Soredex in both colleges. The classification designed by Pell and Gregory's was used in order to compare the

position of mandibular third molar with the anterior edge of the mandibular ramus:²³

Class 1- When the total mesiodistal diameter of the crown is in front of the anterior border of the mandibular ramus;

Class 2- When nearly half of the tooth is covered by the ramus;

Class 3- When the tooth is entirely placed in the mandibular ramus.

Also comparison between the third molar place to the occlusal plane of the 2nd molar is categorized as below:²³

Level A- when the level of occlusal surface of the third molar is the same or higher than the 2nd molar;

Level B- When the level of occlusal surface of the third molar is between the occlusal and the cervical level of 2nd molar; and

Level C- When the level of occlusal surface of the third molar is lower than the cervical line of the 2nd molar.

In the second part of the study, all histopathological reports of impacted teeth were evaluated. Patient information, radiographic findings and histopathological findings were recorded in a form. Data were analyzed using the SPSS16 software. The *P*-value less than 5% was considered statistically significant.

Results

The panoramic radiographs of 2109 patients aged 20–68 years (934 men and 1175 women) were examined. Among the patients, 392 (18.5%) presented with at least one impacted tooth. About 243 women (20.6%) and 149 men (16%) had impacted teeth.

The most frequent position for third molar was mesioangular position and the lowest prevalence was for horizontal (Table 1). The highest frequency was found in position A and the least frequent was in position C (Table 2). In addition, the highest and lowest percentages were for Class 1 and 3, respectively (Table 3).

In the second part of the study, 206 samples (107 women and 99 men) of the lesions associated with impacted teeth were studied. The most lesions associated with impacted tooth was dentigerous cyst, hyperplastic follicle and OKC, respectively (Table 5).

Discussion

The impacted teeth are one of the most important and challenging issues in dentistry. The impacted teeth can be accompanied by several complications that some have a life-threatening risk.^{11,13,18} Various factors including the high density of the bone on the tooth, the prevention of growth by the adjacent tooth, tooth angle, the thickness of the mucosa covering the tooth or the genetic factors lead to latency.¹¹

In our study, 2109 radiographs were surveyed in both centers, including 1175 women and 934 men. Also on the histopathologic evaluation of the cases, 206 patients with impacted teeth found to have lesions.

In this research, the impacted teeth prevalence was 18.5% and was higher in women than men. Saglam et al. reported impacted teeth prevalence to be 11% in Turkey.²⁴ In addition, Nagahara et al in Japan reported a prevalence of 4.9% among 3979 patients.²⁵ Aitasalo et al. did a study in Japan in 1972. They examined 4063 panoramic radiographs and found 14.1% of patients with impacted teeth. The third molar was the most common impacted tooth in both jaws.²⁶ Another similar study by Chu et al. was done among 7486 Hong Kong patients. They found that prevalence of impacted tooth was 28.3%. The difference in

Table 1. The angle of third molar placement relative to the longitudinal axis of second molar teeth

Orientation	Frequency	Percentile (%)
Mesioangular	81	45
Distoangular	24	33.3
Vertical	60	13.3
Horizontal	15	8.4

Table 2. Distribution of third molars based on Pell and Gregory's classification

Level	Frequency	Percentile (%)
A	109	61
B	61	33.9
C	10	5.1

Table 3. Position of the mandibular wisdom teeth relative to the anterior edge of Ramus

Classification	Frequency	Percentile (%)
1	107	59.4
2	49	27.2
3	24	13.4

Table 4. Frequency of distribution of impacted teeth in both jaws

Tooth	Frequency	Percentile (%)
Third mandibular molar	180	45/9
Third maxillary molar	123	31.4
Maxillary canine	59	15
Second mandibular premolar	19	4.9
Mandibular canine	5	1.3
Second mandibular molar	4	1
Second maxillary premolar	2	0.5

Table 5. Type and frequency of dental lesions of patients participating in the study

Lesions	Frequency	Percentile (%)
Dentigerous cyst	68	33
Hyperplastic follicle	51	24.7
OKC	49	23.7
Odontoma	11	5.4
Ameloblastoma	11	5.4
Ossifying fibroma	8	3.9
Complex odontoma	5	2.4
Fibroadontoma	3	1.5

the dimensions of jaws between women and men was one of the reasons for more prevalent tooth impaction in women.¹⁰

In the recent study, mesioangular angulation was the most seen type of impacted mandibular third molar, which was followed by distoangular, vertical and horizontal angulations. Eshghpour et al.,¹² Hashemipour et al.,¹¹ Quek et al.,²⁷ Moris and Jerman,²⁸ and Hassan²⁹ found out the most prevalent type of impaction was mesioangular impaction in the mandibular third molars in Iranian, African American, Singaporean, American, and Arabian populations respectively. Also in our study, level A was the most common impaction level. Findings

of Monaco et al.,³⁰ Obiechina et al.,³¹ Hugoson and Kugelberg,³² and Hashemipour et al. was in agreement with our research result.¹¹ In our study, the classification had been done according to the relationship of occlusal surfaces of the third molar and the adjacent second molar. However, in some studies, the impaction level were assessed based on the position of CEJ to the alveolar bone level.¹²

In present study, the most common impaction depth was Class one. In agreement with this finding, Haghanifar et al.³³ founded that level A and class 2 were the most common type of impaction, but Obiechina et al.,³¹ and Eshghpour et al.¹² founded that class 2 Pell and Gregory's classification was the most prevalent type of impaction. Differences may be because of the classification or age of patients. In the present study all patients were older than 20 years.

Hashemipour et al.¹¹ found that the third molar impaction prevalence was 44.3% in the Southeast region of Iran. Moreover, a lower prevalence has been seen in some studies, such as research from Eliasson et al.³⁴ 30.3%, Hattab et al.³⁵ 33%, and Hassan²⁹ 40.8%. However, Quek et al. 68.6% showed a higher prevalence for impaction in a study done in Singapore.²⁷

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Conflicts of interest

The authors disclose no conflicts of interest. ■

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