

IMPACTED THIRD MOLARS AND ASSOCIATED PATHOLOGY IN JORDANIAN PATIENTS

Jasser K. Ma'a'ita, + BDS, MSc

هدف هذه الدراسة هو دراسة حالة أرحاء العقل المطمورة والآفات المرضية المصاحبة لها لمعرفة مدى حدوثها وأنواعها ، حيث أجريت الدراسة على (٦٠٠) مريض من كلا الجنسين أعمارهم تتراوح ما بين (١٧-٧٠ سنة) ممن حولوا لمراجعة عيادة جراحة الفم و الفكين للتشخيص والاستشارة والمعالجة .

تم جمع المعلومات عنهم من خلال الفحص السريري ودراسة الصور الشعاعية لكل مريض ، كانت نتائج هذه الدراسة كما يلي: نسبة حدوث انطمار أرحاء العقل ٥٤% من الإناث و ٤٦% من الذكور، ونسبة وجودها في الفك السفلي (٦٠,٦%) وفي العلوي (٣٩,٤%) ، (٤٠,٤%) من المرضى يوجد عندهم أربعة أضراس مطمورة ، (٢٦,٤%) ثلاثة أضراس ، (٢١,٨%) ضرسين ، (١٠,٩%) ضرس واحد ، (٦,٢%) من المرضى كانوا من الفئة العمرية من (٢٠-٣٠) سنة ، ٢٧% من الفئة العمرية (٢٠-١٠) سنة و (٤%) فوق الأربعون سنة.

بينت الدراسة أن المشاكل المرضية المصاحبة لأرحاء العقل المطمورة هو التواج بنسبة (٢٣,٦%) يتبعها التسوس بنسبة (٥٧,٩%) ، ونسبة حدوث الآفات المرضية الأخرى مثل الأكياس والأورام السنية ، وامتصاص الجذور كانت قليلة جدا . تشير نتائج هذه الدراسة أن النسبة العالية لأضراس العقل المطمورة هي في الفك السفلي وان من أكثر المشاكل المرضية المصاحبة لها هي التواج (التهاب الأنسجة المحيطة بالرحى) المسببة الألم والشكوى ومن ثم التسوس في الدرجة الثانية.

The objective of this study was to assess the status of impacted third molars and to determine the frequency and type of pathological conditions associated with these impacted teeth. The study consisted of 600 patients who were referred to the Oral Surgery Clinic for consultation, diagnosis, and treatment for partially, or completely impacted third molars of the mandible and maxilla. The age range of patients was between 17 and 70 years. Clinical and radiographic examinations were carried out. The results showed that approximately 40.4% of the patients had all the four third molars impacted, 26.4% had three third molars impacted, 21.8% had two third molars impacted, while 10.9% had one third molar impacted. Male to female ratio was 4.6 to 5.4. The mandible accounted for 60.6% and the maxilla 39.4% where 43.4% were in mesioangular position, 30.3% in vertical position, 16% in distoangular position and 10.3% horizontally. Among the patients, 62% were 20-30 years, 27% were 10-20 years and only 4% were over 40 years. Pathological conditions associated with impacted third molars were found in 37.9%. The most common condition was pericoronitis in 23.6%, followed by dental caries in 7.9%.

Introduction

Erupting third molars not involved in concurrent pathology may become impacted for a variety of reasons. Most often, impaction of third molars is caused by either insufficient maxillofacial skeletal development or a low correlation between maxillofacial skeletal development and third molar maturation leading to a lack of space between the second molar and the ramus.¹² The position of an impacted third molar can be classified radiographically according to the anterior-posterior space between the second molar and the mandibular ramus, its superior-inferior position, its medial-lateral

position in the body of the mandible, and the position of its long axis.³ Retained, unerupted third molar teeth have been associated with various pathological conditions.⁴⁶ These include cystic lesions, neoplasms, pericoronitis, periodontitis and pathological root resorption as well as detrimental effects on the adjacent teeth. This study was carried out on Jordanian patients referred for diagnosis and treatment of wisdom teeth in two hospitals in Zarka (civilian Zarka hospital and military Zarka hospital) from November 1989 to March 1991. The aim of the study was to assess the status of impaction and to determine the frequency of its association with other pathological conditions.

Received 23 November 1998; Revised 20 March 1999;

Accepted 01 May 1999

tConsultant in Oral Surgery and Head of Oral Surgery Unit
Queen Alia Hospital, Amman, Jordan

Address reprint requests to:

Dr. Jasser K. Ma'a'ita

Tariq, PO Box 563

ZC 11947, Amman, Jordan

Materials and Methods

The study focused on 600 patients who were referred to the Oral Surgery Clinic for consultation, diagnosis and treatment for partially or completely impacted third molars of the mandible and maxilla. There were 324 females and 276 males, between the age of 17 and 70 years. The presence and location of the involved tooth as well as the position of impaction and the association of pathological conditions were noted. Clinical findings from oral examination were correlated with age and gender. The radiographic and clinical examinations were comprehensive with respect to types of impaction, number of impacted third molars per person and the association of pathological conditions such as dental caries in the impacted tooth, pericoronitis, abscess, periapical radiolucency, dentigerous cyst, root resorption of adjacent teeth, supernumerary teeth and odontogenic tumours. Clinical status was assessed as unerupted and partially erupted teeth. With a modification of Winter's classification,⁷ impacted third molars were classified into mesioangular, distoangular, horizontal and vertical.

Results

Among the 600 patients, 276 were males (46%), and 324 were females (54%) and their ages ranged from 17 to 70 years. (Table 1). The majority were in the third decade. The number of impacted third molars found in the patients was 1779, 701 were in the maxilla and 1078 were in the mandible. Of all the patients, 40.4% had all four third molars impacted; 26.9% had three impacted; 21.8% had two impacted; and 10.9% had one impacted third molar (Table 2). The frequency of impaction in the maxilla was 39.4% and 60.6% in the mandible leading to a ratio of 1:1.5.

Types of impaction are listed in Table 3. Mesioangular impaction was most common, followed by vertical, impaction, distoangular and horizontal impactions. The prevalence of associated pathological conditions are shown in Table 4. Pericoronitis was present in 23.6% of impacted teeth, 22.5% of which was in the mandible. Dental caries was the second most frequently seen associated condition being 7.9%

Table 1. Age and sex distribution.

Age	Female	Male	Total	Percent
10-20	94	68	162	27%
20-30	202	175	377	62.8 %
30-40	19	18	37	6.2 %
40-50	6	9	15	2.5%
50-60	2	4	6	1%
60-70	1	2	3	0.5%
Total	324 (54%)	276 (46%)	600	100%

Table 2. Number of impacted third molars per person.

Sex	Number of impacted third molars				Total
	Four	Three	Two	One	
Male	112 (40.5%)	73 (26.4%)	63 (22.8%)	28 (10.1%)	276
Female	130 (40.2%)	88 (27.2%)	68 (20.9%)	38 (11.7%)	324
Total	242 (40.4%)	161 (26.9%)	131 (21.8%)	66 (10.9%)	600

Table 3. Frequency for type of impaction of mandibular and maxillary third molars.

Types of Impaction	Maxilla		Mandible		Both Jaws	
	No.	%	No.	%	No.	%
Mesioangular	319	17.9	453	25.5	772	43.4
Distoangular	95	5.3	190	10.7	285	16
Horizontal	8	0.5	175	9.8	183	10.3
Vertical	279	15.7	260	14.6	539	30.3
Total	701	39.4	1078	60.6	1779	100

Table 4. Frequency for pathologic condition associated with impacted mandibular and maxillary third molars.

Types of Pathologic Condition	Maxilla		Mandible		Both Jaws	
	n = 701		n = 1078		n = 1779	
	No.	%	No.	%	No.	%
Pericoronitis	20	1.1	400	22.5	420	23.6
Caries in third molar	25	1.4	115	6.5	140	7.9
Dentigerous cyst	3	0.1	30	1.7	33	1.8
Dental abscess	2	0.1	25	1.4	27	1.5
Periapical Radiolucency	4	0.2	24	1.3	28	1.5
Supernumerary teeth	3	0.2	6	0.3	9	0.5
Root resorption	3	0.1	10	0.6	13	0.7
Osteomyelitis	0	0	1	0.06	1	0.06
Odontogenic Tumour	1	0.1	4	0.2	5	0.3
Total	61	3.3	615	34.6	676	37.9

of the impacted molars. Dentigerous cyst found were 33 (1.8%), 30 (1.7%) of them were observed in the mandible. Dental abscess that had resulted from pericoronitis was present in 27 impactions, 25 of which were in the mandible. Periapical radiolucencies, root resorption, supernumeraries, osteomyelites and odontogenic tumours were uncommon. Odontogenic tumours found were 5, 4 of which were seen in the mandible.

Discussion

Impacted wisdom teeth account for 98% of all impacted teeth.⁸ In this study of 600 patients with 1779 impacted third molars, the mandible accounted for 60.6% of the impactions and 39.4% were in the maxilla which is not in agreement with reports of other studies.⁹⁻¹⁰ Mead⁹ found an equal prevalence of impactions in both jaws, while Bjork et al¹⁰ noted a preponderance in the maxilla. Shah et al¹¹ and Van der Linden et al¹² reported a higher prevalence in the mandible as was found in this study. Dachi and Howell¹³ examined the radiographs of 1685 students at the University of Oregon and found 16.9% third molar impaction, 63.7% of which were maxillary and 36.5% were mandibular.

The present study showed that 43.4% of the impacted third molars in both jaws were in mesioangular position, 30.3% in vertical position, 16% in distoangular position and 10.3% in horizontal position. These numbers are comparable to those of Van der Linden et al.¹² Depending on the manner in which impaction is defined, the incidence of non-erupted third molars is said to be between 22.3% and 66.6%.^{10,14-15}

Factors that influence third molar eruption are skeletal growth pattern, direction of eruption of the dentition, dental extractions as well as root configuration and maturation of the third molar.¹⁰ Pathological conditions were found in connection with 676 teeth (37.9%) in this study. Pericoronitis was the most frequently seen and its frequency of 23.6% is similar to that reported by others.¹⁶⁻¹⁷ Kay¹⁸ has shown that the occurrence of pericoronitis in relation to lower third molars varies seasonally. He reported a

peak age of 21 to 25 years and varying recurrence rates of 3 to 15 months depending on whether or not the impinging maxillary tooth had been extracted. Impinging maxillary dentition has been shown to contribute to the process in more than one third of the cases.¹⁹ Caries of impacted teeth detected in this study (7.9%) is comparable to the figures reported by Van der Linden et al¹² (7.1%), by Samsudin and Mason¹⁷ and Laskin et al²⁰ (6.5%). Dentigerous cysts were more commonly associated with impacted mandibular third molars in the present study. In both jaws, the frequency was 1.8% of all associated pathological conditions. A radiolucency in excess of 4 mm was regarded as a cyst while smaller lesions were considered as dilated follicles.²¹ Prevalence of cyst formation ranges from 0.001% when a biopsy was done²² to 11%²³ when diagnosis was clinical. Other associated pathological lesions were observed but infrequent. The associated odontogenic tumours were two odontoma, two ameloblastoma and one epithelial odontogenic tumour.

References

1. Varrela J. Occurrence of malocclusion in attritive environment: A study of skull sample from South West Finland. *Scand J Dent Res* 1990, 98:242-45.
2. Sato K and Mitani H. Relationship between late adolescent growth of mandible and maturity indicators (mandibular third molar, hand bones, body height) in Japanese boys. *J Orthod Soc* 1990,49:140-43.
3. Pell GJ, and Gregory BT. Impacted mandibular third molars, classification and simplified technique for removal. *Dent Dig* 1933, 39:330-35.
4. Laskin DM. Evaluation of the third molar problem. *JAM Dent Assoc* 1971, 82:824-27.
5. Hinds EC and Frey KF. Hazards of retained third molars in older persons: Report of 15 cases. *J AM Dent Assoc* 1980, 101:246-49.
6. Garcia RI and Sinclair CJ and Chauncey HH. Internal resorption of an unerupted third molar tooth. *Spec Care Dent* 1986,6:205-7.
7. Winter GB. Impacted third molars. St. Louis: American Medical Book, 1926: 241-79.
8. Ailing CC and Catone GA. Management of impacted teeth. *J Oral Maxillofacial Surg* 1993, 51:3-6.
9. Mead SV. Incidence of impacted teeth. *Int J Orthod* 1930, 16:885-88.
10. Bjork A, Jensen E and Palling M. Mandibular growth and third molar impaction. *Acta Odont Scand* 1956, 14:231-35.

11. Shah RM, Boyd MA and Wakil JF. Studies of permanent tooth anomalies in 7886 Canadian individuals, I. Impacted teeth. *J Can Dent Assoc* 1978,44:262-65.
12. Van der Linden W, Cleaton-Jones P and Lownie M. Diseases and lesions associated with third molars. Review of 1001 cases. *Oral Surg Oral Med Oral Pathol* 1995, 79:142-45.
13. Dachi SF and Howell FV. A survey of 3784 radiographs. *Oral Surg* 1961, 14:1165-67.
14. Morris CR and Jerman AC. Panoramic radiographic survey: A study of embedded third molars. *J Oral Surg* 1971, 29:122-25.
15. Vanta I, Murtoma H, Turtola L, Meurmanjand Ylipaavalniemi P. Clinical follow up study of third molar eruption from ages of 20 to 26 years. *Oral Surg Oral Med Oral Pathol* 1991, 72:150-55.
16. Vanta I, Turtola L, Murtomaa H and Ylipaavalniemi P. Third molar as an acute problem in Finnish university students. *Oral Surg Oral Med Oral Pathol* 1993,76:135-40.
17. Samsudin AR and Mason DA. Symptoms from impacted wisdom teeth. *Brit J Oral & Maxillofac Surg* 1994, 32:380-83.
18. Kay LW. Investigations into nature of pericoronitis. *BritJOralSurg*1966, 3:188-91.
19. Halverson BA and Anderson WH. The mandibular third molar position as a predictive criteria for risk for pericoronitis: A retrospective study. *Mil Med* 1992, 157:142-45.
20. Laskin DM. Asymptomatic impacted wisdom teeth. *JAMA* 1984,251:1766-69.
21. Shear M. Cysts of the oral regions. 2nd ed. Bristol John Wright & Sons Ltd., 1983: 138-40.
22. Shear M and Singh S. Age standardized incidence rate of ameloblastoma and dentigerous cysts on the witwatersrand. *Community Dent Oral Epidemiol* 1978,6:195-98.
23. Hellman M. Our third molar teeth, their eruption, presence, and absence. *Dent Cosmos* 1936, 78:750-52.