



Clinical assessment of position of impacted lower third molars and their indications for extraction

Dr. Yahya A. Ali, B.D.S., F.I.C.M.S. *

Dr. Aqeel Ibarheem, B.D.S., M.Sc.**

Dr. Taha Yaseen Hamad, B.D.S., M.Sc.***

Abstract

The purpose of this study was to assess the position of impacted lower third molars, the indications for extraction, and the post-operative complications. Records of patients who attended Misan general hospital between March 2008 and April 2009 for surgical removal of mandibular third molars.

The angulation type and depth of impaction were determined by reviewing the orthopantomograms. A total of 140 impacted teeth were surgically extracted from 132 patients (69 males, 63 females). The reasons for extraction include recurrent pericoronitis (55%) followed by caries (25%) and prophylactic purposes (20%).

Mesioangular impactions accounted for (49.29 %) and Level 1 position of impaction accounted for (65%) of extractions. 40 complications (28.57%), including persistent pain and swelling, infection, dry socket, Trismus and ulceration were reported. Persistent pain and swelling was the most common complications followed by infection.

There was no significant relationship between the angulation, level of impaction and the occurrence of complications. Mesioangular type and Level A position of impaction were the most common impaction. Although the association was not significant, high frequency of post-operative complications was observed in mesioangular, horizontal and level A position of impaction.

Keyword: Surgical extraction of impacted lower 3rd molar, lower 3rd molar impaction. Complication of extraction.

Introduction

The lower third molars are the most frequently impacted teeth in the human and surgical extraction has become one of the most common dentoalveolar surgical procedures¹. Impacted lower third molars are often associated with pericoronitis, periodontitis, cystic lesions, neoplasm, and pathologic root resorption and can cause detrimental effects on adjacent tooth². Studies

have shown that patients with retained impacted third molars are significantly more susceptible to mandibular angle fracture of the mandible. Patients with impacted lower third molar may present with pain, caries, gingivitis and oral infections².

Studies suggest that third molars play at least some role in crowding and in severe cases, removal of the

* maxillofacial surgeon, Lecturer in college of Dentistry, University of Misan

** oral and maxillofacial radiology, College of Dentistry, University of Basrah

*** Oral surgery department, college of dentistry, Almustansiriya University

impacted molars could be recommended. To relieve these symptoms, lower third molars are indicated to undergo either conventional or surgical extraction³.

Many impacted lower third molars remain asymptomatic for years but are often surgically extracted to prevent development of future complications and pathologic conditions. Many dental Surgeons in Europe and America consider prophylactic extraction of fully impacted wisdom teeth as the ideal approach⁴. Several factors have been associated with the occurrence of complications which include age, health of patient, gender, smoking status, degree of impaction, surgeon's experience and the surgical technique used⁵.

Many authors have stated that position of the impacted third molar may be associated with complications resulting from extraction⁶. There is no published data regarding impacted third molar position and post-operative complications among Iraqi patients. Thus this study aimed to investigate the position of impacted lower third molars, indications of surgical procedure, and the post-operative complications. The aim of this study was to assess the position of impacted lower third molars, the indications for extraction, and the post-operative complications.

Patients and methods

The age, gender, number of impacted lower third molar extracted, pathological conditions such as caries, pericoronitis, or cyst were recorded. The outcome of extraction was documented as presence or absence of complications which include persistent pain and swelling, surgical site infection, alveolar osteitis (dry socket), trismus and ulceration, the position of the impacted third molar was

determined by OPG. The angulation of impacted third molar was recorded based on winter's classification with reference to the angle formed between the longitudinal axes of the second and third molars. The angulation of impaction was measured using Quek *et al* method⁷. Figure 3, to classify vertical impaction (10° to -10°), mesioangular impaction (11° to 79°), horizontal impaction (80° to 100°), distoangular impaction (-11° to -79°). The depth of third molar in relation to occlusal plane (Level A, B, C) was documented according to Queck *et al*,⁷ (figure 3). Level A: the crown is on the same level as the occlusal plane and the cemento-enamel junction lies above the alveolar bone. Level B: the crown lies between the occlusal plane and the cemento-enamel junction of the second molar and the cemento-enamel junction of the third molar lies below the border of the alveolar bone (the crown not completely embedded in bone). Level C: the tooth lies completely embedded in bone below the cemento-enamel junction of the second molar.

Descriptive statistical analysis was used in this study. The data was tabulated and displayed by frequency and percentage using statistical package SPSS Version 16.

Results

There were 132 patients 69 (52.28%) males and 63 (47.72%) females, age between 16 to 52 years with mean age of 24.6 years.

Most extractions were carried out in the 16 to 25 years old group where in this group 45% were females.

Recurrent pericoronitis was the most common indication for extraction affecting 55% of impacted teeth, about 25% were extracted due to caries, and 20% were extracted for prophylactic reasons.

Figure 1 illustrates the type of impaction. Mesioangular impaction was the most frequently seen (49.29%) followed by horizontal (27.14%), vertical (15%) and distoangular impaction (8.57%).

Tabl showed Level A as the most common position of impaction (65%) and Level C was the least common (7.86%).

Among all extractions. The complication rate was (28.57%). Persistent pain and swelling were the most common postoperative complication in mesioangular, horizontal and vertical type of impactions which were (22.5%), (12.5%) and (7.5%) respectively. Infection which accounting (20%) of total complications was observed in all types of angulations except vertical type. while trismus was documented in horizontal impaction (10%) and mesioangular impaction (7.5%). Dry socket occurred in extractions of mesioangular, vertical and horizontal type each of them accounting to (5%) (Figure 2).

With regard to the level of impaction, pain and swelling was the common complication in all positions, followed by Infection (20%), trismus (17.5%).

Dry socket appeared in (15%) of extraction at Level A, (12.5%) and Level C (2.5%),

Discussion

The positions of impacted mandibular third molars, pre-operative pathology, and postoperative complication have been studied in various populations. studies in Nigeria showed that mesioangular type of impaction was the most frequently seen^{8,9}. Likewise, it was also the most common type among Chinese (80%) and Korean populations (46.5%). In

this study, mesioangular impaction was the most common type (50%)¹⁰.

Assessment of depth of impaction with reference to the occlusal plane of the second molar, it was found that the greatest percentage was seen in Level A (65%). In a Spanish population the predominant position was Level B¹¹. The findings of the present study was thus in accordance with most reports that most impacted third molars were at Level A, where the position of the highest portion of third molar was at occlusal level which is Level A.

Recurrent pericoronitis was the most frequent indication for removing impacted mandibular third molars in this study. Which was agreement with Tay AB et al 2004, Assael et al 2005. This was similar with other reports^{12,13}. On the other hand, Huang IY et al. (2008) found that caries and its sequel was the major reason of extraction, followed by pericoronitis and periodontitis¹⁴. Caries accounted for 25% removals in this study, which was the second most common indication. Considerable controversy exists regarding prophylactic removal of asymptomatic impacted molars. Some surgeons favor a conservative approach while others opted for more interventional strategies¹⁵. The prophylactic removal was justified on the basis that the risk of surgical morbidity increases with increasing age¹⁶.

Persistent pain and swelling, infection, trismus, alveolar osteitis (dry socket), ulceration, adjacent tooth injury, temporomandibular joint injury, and possible fracture of the mandible are possible post-operative complications¹⁷. In this study, persistent pain and swelling was the most common complication (42.5%), infection was developed in (20%). Other complications such as trismus, ulcerations and alveolar osteitis were observed infrequently

Although there was no significant association between post-operative complications and angulation of impacted molars, we highlighted that the third molars within a mesioangular impaction had the highest number of complications.

Likewise, Saglam A et al¹⁸. reported the higher rate of complications in extractions of mesioangular impacted mandibular third molars compared to the other types, they concluded that there were direct relation between the degree of impaction of extracted tooth and the incidence of complications.

On the other hand, the greatest incidence of infections observed in the extraction of third molars in vertical position¹⁹.

In this study the number of impacted teeth in each position was small, hence the occurrence of post-operative complication of teeth from Level B and C were not comparable

Muhonen A et al, found that the teeth at the position of Lenel C had more complications. Deeper impaction leading to greater likelihood of tissue disturbance and longer operation times, which explained the tendency for more complications than other positions²⁰.

Conclusions

The most common indication for removing impacted mandibular third molars was recurrent pericoronitis. Mesioangular and horizontal type of impaction were most common and should be taken into consideration for high frequency of complications after extraction. Impaction depth classification of A and C are the teeth most inclined to develop complications.

References

- 1- Mercier P and Precious D (2005). Risks and benefits of removal of impacted third

- molars. A critical review of the literature. *Int J Oral Maxillofac Surg*, 21(1): 17-27. Ministry of Health, Malaysia (2005). Management of unerupted and impacted third molar teeth. Clinical Practice Guidelines. MOH/P/PAK/107.05 (GU)
- 2- Fuselier J.C, Ellis E.E, Dabson T.B. Do Mandibular Third Molars Alter the Risk of Angle Fracture? *J. Oral Maxillofac. Surg.* 2002; 60: 514-518.
- 3- Woldenberg Y, Gatot I, Bodner L. Iatrogenic mandibular fracture associated with third molar removal. Can it be prevented?. *Med Oral Patol Oral Cir Bucal.* 2007;12:E70-2.
- 4- Visintini E, Angerame D, Costantinides F, Maglione M. Peripheral neurological damage following lower third molar removal. A preliminary clinical study. *Minerva Stomatol.* 2007;56:319-26.
- 5- Sisk AL, Hammer WB, Shelton DW, Joy ED Jr. Complications following removal of impacted third molars: the role of the experience of the surgeon. *J Oral Maxillofac Surg.* 1986;44:855-9.
- 6- Bouloux GF, Steed MB, Perciaccante VJ. Complications of third molar surgery. *Oral Maxillofac Surg Clin North Am.* 2007;19:117
- 7- Queck S.L, Tay C.K, Tay K.H, Toh S.L, et al; Pattern of Third Molar Impaction in a Singapore Chinese Population: A Retrospective Radiographic Survey. *Int. J. Oral Maxillofac. Surg.* 2003; 32: 548-52.
- 8- Lago-Méndez L, Diniz-Freitas M, Senra-Rivera C, Gude-Sampedro F, Gándara Rey JM, García-García A. Relationships between surgical difficulty and postoperative pain in lower third molar extractions. *J Oral Maxillofac Surg.* 2007;65:979-83.
- 9- Robert RC, Bacchetti P, Pogrel MA. Frequency of trigeminal nerve injuries following third molar removal. *J Oral Maxillofac Surg.* 2005;63:732-5.
- 10- Haug RH, Perrott DH, Gonzalez ML, Talwar RM. The American Association of Oral and Maxillofacial Surgeons Age-Related Third Molar Study. *J Oral Maxillofac Surg.* 2005;63:1106
- 11- Ziccardi VB, Zuniga JR. Nerve injuries after third molar removal. *Oral Maxillofac Surg Clin North Am.* 2007;19:105-15.
- 12- Tay AB, Go WS. Effect of exposed inferior alveolar neurovascular bundle during surgical removal of impacted lower third molars. *J Oral Maxillofac Surg.* 2004;62:592-600.
- 13- Assael LA. Indications for elective therapeutic third molar removal: the

- evidence is in. *J Oral Maxillofac Surg.* 2005;63:1691
- 14- Huang IY, Chen CM, Chang SW, Yang CF, Chen CH, Chen CM. Surgical management of accidentally displaced mandibular third molar into the pterygomandibular space: a case report. *Kaohsiung J Med Sci.* 2007;23:370-4.
 - 15- Kunkel M, Kleis W, Morbach T, Wagner W. Severe third molar complications including death-lessons from 100 cases requiring hospitalization. *J Oral Maxillofac Surg.* 2007;65:1700-6.
 - 16- Pichler JW, Beirne OR. Lingual flap retraction and prevention of lingual nerve damage associated with third molar surgery: a systematic review of the literature. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2001;91:395-401.
 - 17- Mercier P and Precious D. Risks and Benefits of Removal of Impacted Third Molars. A Critical Review of the Literature. *J. Oral Maxillofac.Surg.* 1992; 21:17-27.
 - 18- Saglam A. and Tuzum S. Clinical and Radiologic Investigation of the Incidence, Complications, and Suitable Removal Times for Fully Impacted Teeth in the Turkish Population. *Quintessence Int.* 2003; 34: 53-59.
 - 19- Capuzzi P, Montebugnoli L, Vaccaro MA. Extraction of impacted third molars. A longitudinal prospective study on factors that affect postoperative recovery. *Oral Surg Oral Med Oral Pathol.* 1994;77:341-3.
 - 20- Muhonen A, Ventä I and Ylipaavalniemi P (1997). Factors predisposing to postoperative complications related to wisdom tooth surgery among university students. *J Am Coll Health,* 46(1).

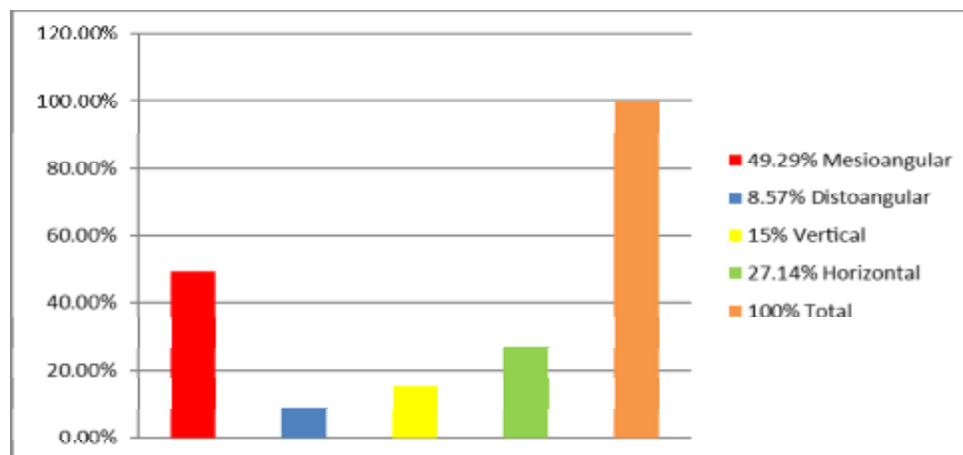


Figure 1: Bar chart of percentage of type of angulation.

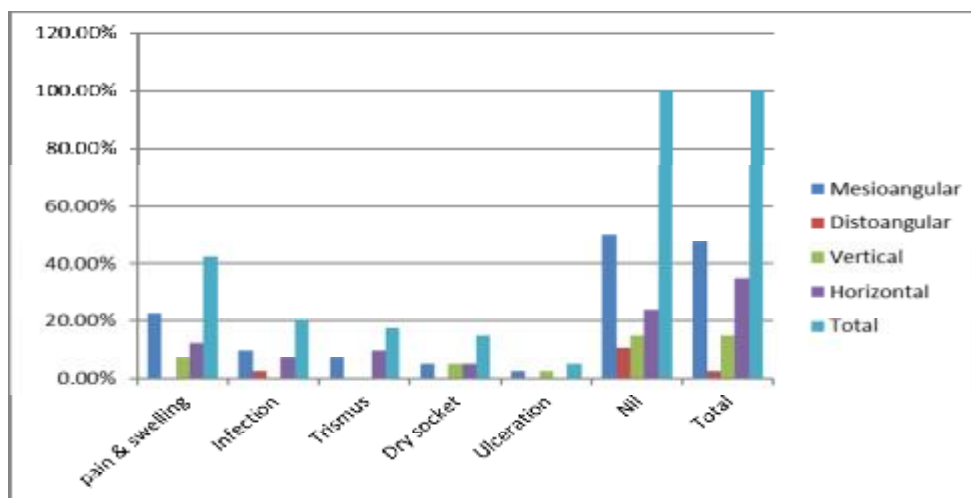


Figure 2: Bar chart of percentage of postoperative complications.

Table 1: Number and percentage of surgically extracted lower third molars according to Level of impaction and postoperative complications

Postoperative Complications	Level of impaction			
	Level A 91(65%)	Level B 38(27.14%)	Level C 11(7.86%)	Total 140 (100%)
Persistent Pain& swelling	13(32.5%)	1(2.5%)	3(7.5%)	17(42.5%)
Infection	4(10 %)	1(2.5%)	3(7.5%)	8(20%)
Trismus	5(12.5%)	0(0 %)	2(5%)	7(17.5%)
Dry socket	5(12.5 %)	0 (0 %)	1(2.5%)	6(15%)
Ulceration	1(2.5%)	1 (2.5 %)	0(0 %)	2(5%)
Nil	63(63%)	35(32%)	2(5%)	100(100%)
Total	28(70%)	3(7.5%)	9(22.5%)	40(100%)

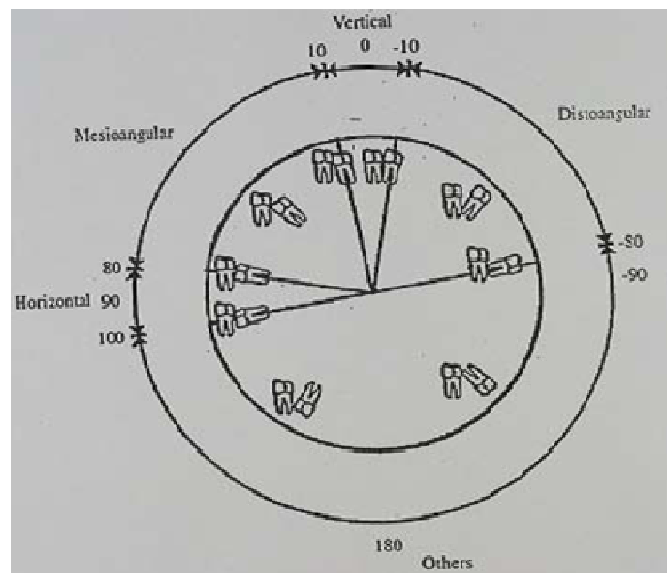


Figure 3: Angular position of impacted third molars (Queck et al, 2003)