

# Assessment of Impaction Pattern and Associated Symptoms for Mandibular Third Molar.

(DPT study)

Ghassan Ali Abbas

Aymman Hameed Uraibi

Department of Oral & Maxillofacial Surgery, College of Dentistry, University of Babylon

[ghassan\\_ali@ymal.com](mailto:ghassan_ali@ymal.com)

Abdulmunim Salman Madlol

Department of Conservative Dentistry, College of Dentistry, University of Babylon.

[monain\\_salman@yahoo.com](mailto:monain_salman@yahoo.com)

## Abstract

245 patients their aged 16 years and above (mean 25.86, standard deviation 5.72 years: 55.51 % were females and 44.49 % males) were seen. They presented with 358 impacted mandibular third molars. (67.88 %) impaction were seen in patients between the ages of 16 to 25 years, while (89.67 %) impaction were seen between the ages of 16 to 30 years.

Assessing the level of impaction using PELL and G R E G O R Y classification showed that 154 (43.02 %) impaction were in position A, 135 (37.71 %) were in position B while 69 (19.27 %) were in position C. 89 of impacted teeth were in position I (24.86 %), 211 (58.94 %) were in position II, while 58 (16.20 %) were in position III.

Between 358 impacted mandibular third molars, (62.29 %) had symptoms of pain. (67.6 %) impacted teeth were associated with pathological lesions. Out of these, 50.84% were periodontal disease and pericoronitis, 15.64% were caries, while 1.12 % were associated with cysts.

In conclusion, the level of impaction suggests that a remarkable number of impacted mandibular third molars should be removed under general anesthesia. There is need for further studies to determine the levels of impaction, the types of anesthesia used during extraction and the outcome.

**Key words :** Mandibular third molars, pattern of impaction, DPT: Dental Panoramic Tomography.

## الخلاصة

تمت دراسة 245 مريض تبدأ اعمارهم من 16 عاماً فأكثر (بمتوسط عمر 25,86 وبمعامل انحراف 5.72 سنة: كانت نسبة الاناث بين العينات المدروسة 55,51% في حين ان نسبة الذكور كانت 44,49%). وقد وجد ان عدد الحالات التي تكون فيها اسنان العقل السفلية مضمورة هي 358, وقد وجد ان 67,88% من هذه الحالات موجودة عند الاعمار بين 16 الى 25 سنة كذلك وُجد ان 89,67% من الحالات تقع بين 16 الى 30 سنة.

تم تقييم مستوى الاسنان المضمورة باستخدام طريقة تصنيف بيل وكريكوري واطهرت هذه الدراسة ان 154 من الحالات كانت موجودة في التصنيف A وبنسبة 43,02%, في حين ان 135 من الحالات في التصنيف B (بنسبة 37,71%), بينما اظهرت النتائج ان 69 حالة (19,27% من الحالات) حصلت على التصنيف C. كما بينت نتائج هذه الدراسة ان 89 حالة من الاسنان المضمورة وجدت في الوضع I وبنسبة 24,86%, بينما وجد ان 211 حالة (58,94%) ظهرت في الوضع II, اما عدد الحالات التي كانت في الوضع III هي 58 وبنسبة 16,20%.

من بين الحالات التي كانت فيها اسنان العقل السفلية مضمورة (358), بينت الدراسة ان 62,29% من هذه الحالات كانت مصحوبة بالالم و67,6% منها مصحوبة بافات مرضية, كما ظهر ان امراض اللثة رافقت 50,84% من الحالات كذلك وجد ان تسوس الاسنان صاحب 15,64% منها بينما نسبة قليلة جدا من الحالات (1,12%) مصحوبة باكياس او خراجات مرضية. في الختام, نجد ان نتائج الدراسة تشير إلى أن عددا ملحوظا من اسنان العقل السفلية يجب إزالتها جراحياً باستخدام التخدير العام. كما ان هناك حاجة لمزيد من الدراسات لتحديد مستويات الانطمار في الاضراس, وأنواع التخدير المستخدمة أثناء عمليات قلع الاسنان ونتائجها.

**الكلمات الرئيسية الدالة:** الأضراس الثالثة في الفك الاسفل, نمط الانطمار, DPT: التصوير الشعاعي المقطعي الشامل المستخدم في طب الاسنان.

## Introduction

Impacted tooth was defined by Mead<sup>(Archer WH: 1966)</sup> as a tooth that is prevented from erupting into position because of malposition, lack of space, or other impediments. Other researchers mentioned that teeth may become impacted when they fail to erupt or develop into the proper functional location. Impacted teeth may therefore be non-functional, abnormal, or pathological<sup>(Waite PD, Raynolds RR: 1998), (Killy HC, Kay LW: 1978)</sup>.

In 2004 Farman<sup>(Agarwal KN et al:2004)</sup> wrote that impacted teeth are those teeth that prevented from eruption due to a physical barrier within the path of eruption. Of all teeth, mandibular third molars are the most frequently impacted (Dimitroulis, 1996).

According to Elsey and Rock (Khan *et al.*, 2006) impaction of the third molar is occurring in up to 73% of young adults in Europe. Generally, third molars have been found to erupt between the ages of 17 and 21 years (Elsey MJ, Rock WP: 2000), (Pahkala *et al.*, 1991). Furthermore, third molar eruption time have been reported to vary with races (Elsey & Rock, 2000), (Kruger, 2001). Third molar eruption and continuous positional changes after eruption can be related not only with race but also with nature of the diet, the intensity of the use of the masticatory apparatus and possibly due to genetic background (Alling & Alling, 1993). There is a large biological variation in the development of third molars, that there are also marked differences in this development between populations of different regions, a geographical variation (Kullman *et al.*, 1992).

Hägg and Taranger (Hägg and Taranger, 1985) found that emergence could be affected by infection or pathology, trauma, crowding, extraction, and the presence of supernumerary teeth. Impaction of third molar may cause pericoronitis, dental caries and the development of cystic lesions (Hattab *et al.*, 1995), (Ma'aita, 2000). All these pathological conditions indicate removing of impacted teeth (Howe, 1978), (TETSCH & WAGNER, 1985).

Several studies have been done on impacted mandibular third molars in developed countries, where several millions of dollars are spent annually on the management of impacted third molars (Edwards *et al.*, 1999), (Edwards *et al.*, 1999), (Flick, 1999), (Ogden GR et al: 1998). In fact, it is regarded as the most common oral surgery performed (Flick, 1999).

Panoramic radiography is an easy and fast technique in which the images of both arches along with their surrounding structures are studied in one view with less radiation exposure than the complete series of intra-oral radiographs (White & Pharoah, 2004).

The aim of this study therefore, is to analyze the pattern, symptoms and pathology associated with impacted mandibular third molar teeth in Babylonian.

## Materials and Methods

A total of 245 patients aged 16 years and above, who presented at the Oral diagnosis clinic in college of Dentistry, University of Babylon, with impacted mandibular third molar teeth from January 2011 to April 2014, were examined clinically and radiographically.

For the purposes of this study, OPG X-rays were selected randomly which meant that not all patients included in the study had attended the Clinic for the management of impacted wisdom teeth. Therefore, patients with any of the following conditions were excluded: any trauma to the jaws that might have disrupted the dentition alignment; third molars presenting with incomplete root formation; absent

adjacent second molars, and/or the presence of congenital diseases or facial syndromes.

Digital Panoramic radiograph of each patient was taken, using certain exposure factors for each gender (male and female) according to user manual. The images were examined on the monitor for the clear representation enhancement of the resolution was done if needed then saved, the images were entered as 1024\*768 pixel digital images (JPEG files) in the computer system. Then two pairs of examiners viewed the OPGs.

The level of impaction was determined using Pell and Gregory classification (Pell GJ, Gregory, 1942) (Fig.1) as follows :

- \* Position A : The highest portion of the impacted mandibular third molar is on a level with or above the occlusal plane.
- \* Position B : The highest portion of the impacted mandibular third molar is below the occlusal plane but above the cervical line of the second mandibular molar.
- \* Position C : The highest portion of the impacted mandibular third molar is below the cervical line of the second mandibular molar.
- \* Position I : None of the crown is in the ramus of the mandible.
- \* Position II : Less than half of the crown is in the ramus.
- \* Position III : More than half of the crown is in the ramus.

All assessments were done by a single examiner. Findings were recorded when both examiners agreed. The results were analyzed using simple proportions.

## Results

There were (245) patients fit with selected criteria of the study. Their ages range from 16 to 40 years, with a mean of 25.86 and standard deviation 5.72 years. 136 (55.51 %) were females and 109 (44.49 %) males. (358) impacted mandibular third molars were seen. Detailed distribution is presented in Table 1.

A total of 243 (67.88 %) impaction were seen in patients between the ages of 16 to 25 years, while 321 (89.67 %) impaction were seen between the ages of 16 to 30 years.

Assessing the level of impaction using Pell and Gregory classification showed that 154 (43.02 %) impaction were in position A, 135 (37.71 %) were in position B while 69 (19.27 %) were in position C. 89 of impacted teeth were in position I (24.86 %), 211 (58.94 %) were in position II, while 58 (16.20 %) were in position III.

Out of the 358 impacted mandibular third molars, 223 (62.29 %) had symptoms of pain. The distribution of impacted teeth with symptoms is presented in Table 2.

Two hundred and forty two (67.6 %) impacted teeth were associated with pathology. Out of these, 182 (50.84 %) were periodontal disease, 56 (15.64 %) were caries, while 4 (1.12 %) were associated with cysts, as it presented in Table 3.

## Discussion

The impacted mandibular third molar is most frequently extracted. The investigations for its removal include determining the type and degree of impaction so as to assess the level of difficulty during extraction.

Results obtain from this study were lower than those obtained from many developed countries, also they were different in the number of transverse, horizontal, and inverted impaction (TETSCH & WAGNER, 1985), (Morris & Jerman, 1971).

It was observed that 19.27 % and 16.20 % of the impacted mandibular third molars were in positions C and III respectively. In these positions, the crown of

impacted teeth are either completely or mostly embedded, and that suggest to avoid performance such difficult extraction under local anesthesia and its preferred to be done with general anesthesia, for the comfort of the patient.

Obviously large proportion of the impaction fall within positions B (37.71 %), and II (58.94 %), indicating that the extractions would be moderately difficult and the choice of appropriate anesthesia whether local or general, would depend on the surgeon's evaluation and the patient's preference. These findings suggest that a remarkable number of impaction should be removed under general anesthesia.

There is therefore the need for further studies to determine if there is any relationship between the level of impaction and impacted third molars extracted under general anesthesia.

Periodontal disease and pericoronitis were the most common pathological lesions associated with impacted mandibular third molars. Next was caries, followed by cysts. These findings are similar to those presented by Obiechina in 1991(Obiechina AE: 1991), also he recorded the presence of odontoma with percentage 0.47% and squamous cell carcinoma 0.24 %, that was not seen in this study and it may assume that these lesions were incidental findings.

Punwutikorn *et al* (Punwutikom , *et al.*, 1999) reported that where symptoms exist, pain was common for erupted and unerupted mandibular third molars. Our finding did not differ. However, pain was most frequent in disto-angular impaction. While 62.29 % of the impacted third molars had symptoms, 37.71 % were asymptomatic and disease free. It was widely accepted that asymptomatic, disease free mandibular third molars be extracted for prophylactic reasons(Killy &Kay, 1978), (Howe, 1978), (TETSCH & WAGNER, 1985). However, the removals of this category of third molars appear controversial.

## Conclusion

The results of our study show the importance of determination third molar impaction pattern and associated lesions for dental management. According to the authors' knowledge, this research paper is the first study joins between impaction pattern and clinical symptoms which may be associated to Babylonian people.

Our results provide that the incidence, types and level of impaction, incidence of symptoms and diseases associated with third molar impaction in developing countries are grossly inadequate for proper planning and management of impacted third molars. There is, therefore, an urgent need for a population based study in order to determine the nature of third molar impaction in Babylonian, for effectual planning.

## References

- Agarwal KN, Gupta R, Faridi MM, Kalra N. Permanent dentition in Delhi boys of age 5-14 years. *Indian Pediatr.* 2004 Oct;41(10):1031-5. [[PubMed](#)]
- Alling CC, Alling RD. Indications for management of impacted teeth. In: Alling CC, Helfrick JF, Alling RD, editors. *Impacted Teeth*. Philadelphia: W.B. Saunders; 1993. p. 49-54.
- Archer WH. *Oral Surgery: A Step-By-Step Atlas of Operative Techniques*, 4th ed. Philadelphia: W.B. Saunders Company; 1966. p. 507-10.
- Dimitroulis G. *A Synopsis of Minor Oral Surgery*. 4th ed. Oxford, UK: Butterworth-Heinemann Publishing; 1996. pp. 48-57.

- Edwards DJ, Horton J, Shepherd JP, Brickley MR. Impact of third molar removal on demands for post-operative care and job disruption: does anaesthetic choice make any difference? *Ann R. Coll Surg Engl.* 1999 ; 81 : 119-23.
- Edwards MJ, Brickley MR, Goodey RD, Shepherd JP. The cost, effectiveness. And cost effectiveness of removal and retention of asymptomatic disease free third molars. *Brit Dent J.* 1999 ; 187 : 38-44.
- Elsay MJ, Rock WP. Influence of orthodontic treatment on development of third molars. *Br J Oral Maxillofac Surg.* 2000 Aug;38(4):350-3. [[PubMed](#)] [[Cross Ref](#)]
- Flick MG. Third molar controversy: framing the controversy as a public health policy issue. *J Oral Maxillofac surg.* 1999 ; 57 : 438-44.
- Hägg U, and Taranger J. Dental development, dental age and tooth counts. *Angle Orthodontist* 1985; 55:93-107.
- Hattab FN, Rawashdeh MA, Fahmy MS. Impaction status of third molars in Jordanian students. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 1995;79:24–9.[[PubMed](#)] [[Cross Ref](#)]
- Howe GL. *Minor oral surgery.* 3rd ed. John Wright Publishers London. 1978 ; 89-115.
- Khan NB, Chohan AN, AlMograbi B, AlDeyab S, Zahid T, AlMoutairi M. Eruption Time of Permanent First Molars and Incisors Among a Sample of Saudi Male Schoolchildren. *Saudi Dent J.* 2006 Jan-Apr;18(1):18-24.
- Killy HC, Kay LW. *The impacted wisdom tooth.* 3rd ed. Publishers Churchill Livingstone London. 1978 ; Pp 18-19.
- Kruger E, Thomson WM, Konthasinghe P. Third molar outcomes from age 18 to 26: findings from a population-based New Zealand longitudinal study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2001 Aug;92(2):150-5. [[PubMed](#)] [[Cross Ref](#)]
- Kullman L, Johanson G, and Akesson L. Root development of the lower third molar and its relation to chronological age. *Swedish Dental Journal* 1992;16:161-167.
- Ma'aitha JK. Impacted third molars and associated pathology in Jordanian patients. *Saudi Dent J.* 2000;12:16–19.
- Morris RM, Jerman AC. Panoramic radiographic survey: a study of embedded third molars. *J Oral Surg.* 1971 ; 29 : 122-126.
- Obiechina AE. Pathologic lesions in third molar impaction in Nigerians. *Nigerian Journal of Medicine.* 1991 ; 1, 2 : 115-7.
- Ogden GR, Bissias E, Ruta DA, Ogston S. Quality of life following third molar removal : a patient versus professional perspective. *Brit Dent J.* 1998; 185: 407 - 10.
- Pahkala R, Pahkala A, Laine T. Eruption pattern of permanent teeth in a rural community in northeastern Finland. *Acta Odontol Scand.* 1991 Dec;49(6):341-9. [[PubMed](#)] [[Cross Ref](#)]
- Pell GJ, Gregory G. Report on a ten year study of a tooth division technique for the removal of impacted teeth. *Journal of Orthodontics and Oral Surgery.* 1942 ; 28 : 660-69.
- Punwutikom J, Waikakul A, Ochareon P. Symptoms of unerupted mandibular third molars. *Oral Surg Oral Med Oral Pathol Oral Radiol & Endodontics.* 1999 ; 87 : 305-10.
- TETSCH P, WAGNER N. *Operative extraction of wisdom teeth.* Wolfe medical publications Ltd. 1985 ; London. Pp 9-24.

Waite PD, Reynolds RR. Surgical management of impacted third molars. Seminar on Orthodontics. 1998 ; 4 : 113-2.  
White SC, Pharoah MJ. Oral radiology: principles and interpretation. 5<sup>th</sup> ed. St Louis: Mosby Inc; 2004. p. 196.

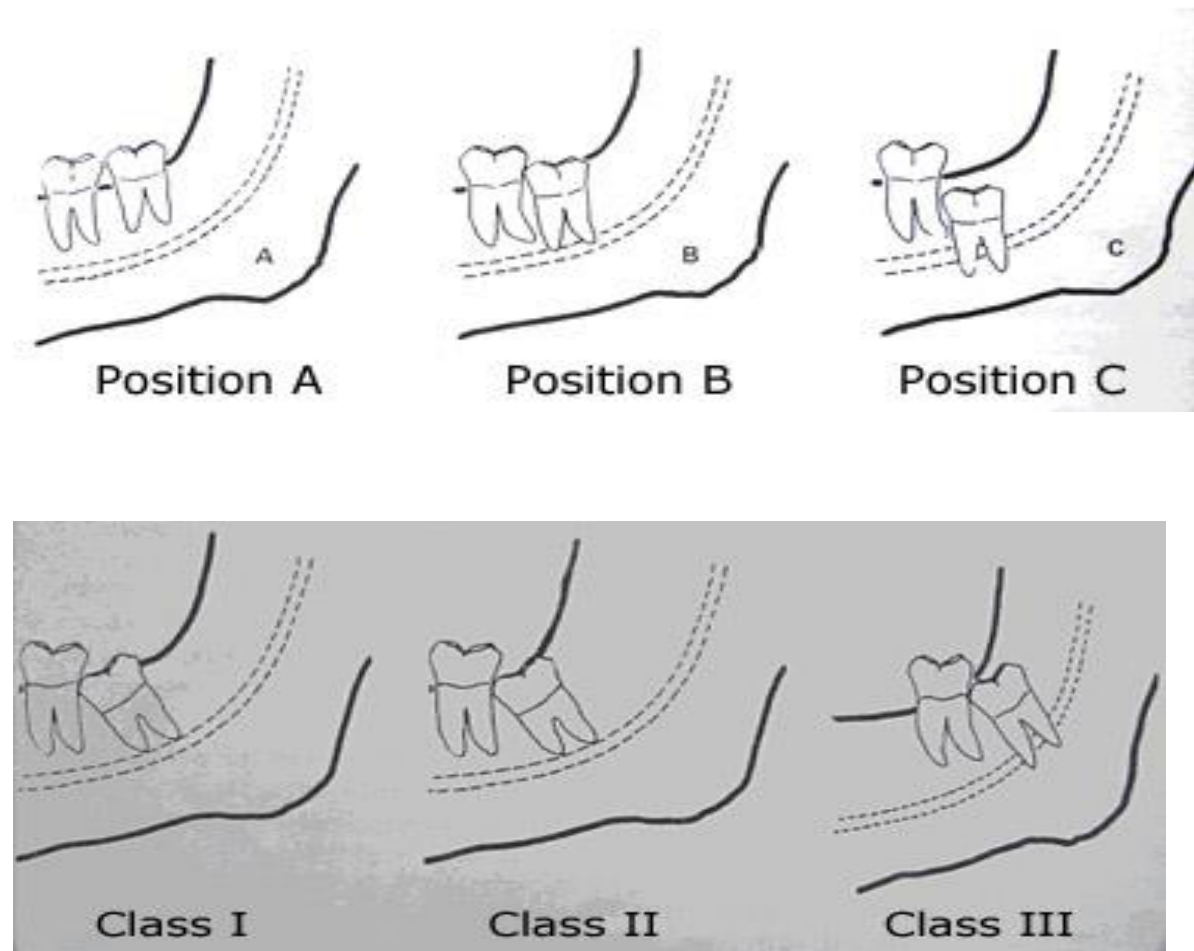


Figure (1) : Pell and Gregory classification :

**Table 1 : Age distribution of types of impaction**

Pattern of impaction	Age (years)					Total
	16-20	21-25	26-30	31-35	36-40	
Mesioangular	53	49	32	10	07	151(42.18%)
Vertical	24	64	13	02	01	104(29.05%)
Horizontal	12	25	28	09	07	81 (22.63%)
Distoangular	06	09	04	00	01	20 (5.58%)
Inverted	00	01	01	00	00	02 (0.56%)
<b>Total</b>	<b>95</b>	<b>148</b>	<b>78</b>	<b>21</b>	<b>16</b>	<b>358</b>
<b>%</b>	<b>26.54%</b>	<b>41.34%</b>	<b>21.79%</b>	<b>5.86%</b>	<b>4.47%</b>	<b>100%</b>

**Table 2 : Distribution of impactions with symptom of pain**

Types of impaction	No . of impaction (%)	No. of Impaction with symptom of pain	Percentage of symptomatic impaction %
Mesioangular	151	108	71.52 %
Vertical	104	58	55.77 %
Horizontal	81	40	49.38 %
Distoangular	20	16	80 %
Inverted	2	1	50 %
<b>Total</b>	<b>358</b>	<b>223</b>	<b>62.29 %</b>

**Table 3: Distribution of pathology with impaction.**

Pathological lesions	No. of lesions	Percentage of lesions	Percentage to total no. of impactions
Periodontal diseases	182	75.21%	50.84%
Caries	56	23.14%	15.64%
Cystic lesion	4	1.65%	1.12%
<b>Total</b>	<b>242</b>	<b>100 %</b>	<b>67.6 %</b>