

A comparative double-blind study among two universal systems of classification of impacted lower wisdom tooth and duration of surgery

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ABSTRACT

Aim: To estimate the importance of time in determining the difficulty of surgical removal of impacted third molars. **Materials and Methods:** Two hundred medically fit patients were selected with an age range between 18–25 years of both sexes. These patients had vertically impacted lower third molars and indicated for surgical extraction. The diagnosis of third molar impaction was based on clinical and standard intraoral periapical radiographs. A double-blind approach was adopted whereby two researchers carried out a classification of the operation based on expected time of surgery and the third researcher performed the surgery. The classification of the impaction was performed pre-operatively according to Pell–Gregory classification, then the operation was performed following the standard procedure for this type of surgery. Following extraction, surgical difficulty was rated according to Garcia *et al.* classification and operation time from the incision till suturing of the flap. **Results:** Comparison among the three classification systems was performed and the results indicated no significant difference among the three classifications regarding simple and moderate operations, but only a significant difference was recorded for the difficult operations. **Conclusion:** This study, however, revealed the importance of time in assessing the difficulty of such operations and this, in turn, will help surgeons in scheduling the treatment plan and taking the necessary precautions when dealing with difficult operations.

Key Words: Impacted third molars, time of operation, classification system.

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INTRODUCTION

Third molar (wisdom tooth) surgery remains the procedure most commonly carried out by oral and maxillofacial surgeons.⁽¹⁾ This tooth continues to generate more controversy in its eruption pattern, classification and pathological sequel than any other tooth in the oral cavity.⁽²⁾

Standard textbooks on oral surgery often contain a good deal of information concerning classification of impacted lower third molars.⁽³⁾ Several methods of classification based on certain criteria have been introduced in the literature, among which are the Pell–Gregory^(4,5) and Garcia *et*

al.⁽⁶⁾ classifications. One of the advantages provided by such classification systems is to assess the degree of difficulty during the removal of such teeth.⁽⁶⁾ In addition, with careful classification of the impacted teeth using a variety of systems, the surgeon can approach the proposed surgery in an orderly fashion and predict whether any extraordinary surgical approaches will be necessary or if the patient will encounter any post-operative problem.⁽⁷⁾

Unfortunately, few studies comment on the effect of time (duration of surgical operation) and its role was not taken into consideration in many classification systems.

ms of impacted wisdom teeth which can be used as a criterion for assessing the degree of difficulty of lower third molar surgery.^(3, 8, 9)

So, the present study was conducted to estimate the importance of time in determining the difficulty of such operations.

MATERIALS AND METHODS

This study was carried out at the College of Dentistry, University of Mosul. A case sheet specially designed for this study was filled for each patient (Figure 1). Two hundred patients with no history of allergy to local anesthetic solution were selected for the study with an age range between 18–25 years of both sexes. For purposes of

standardization, the patient chosen had vertically impacted lower third molars which were indicated for surgical extraction. A double blind approach was adopted whereby two researchers carried out a classification of the operation based on expected time of surgery while the third researcher performed the surgery.

The diagnosis of third molar impaction was based on clinical and standard intra-oral periapical radiographs. A third molar was considered impacted when it could not undergo full eruption after complete root formation due to an obstruction in its path. The obstruction may be the ascending ramus, the second molar or soft tissues.⁽⁷⁾

<u>Impaction Case Sheet</u>	
Patient's Name:	Age:
Date:	Sex:
Address (including telephone number):	
Chief Complaint:	
Medical History:	
Classification of Impaction	
<u>Pre-Operative Classification (Pell-Gregory):</u>	
Class: I: ()	
II: ()	
III: ()	
Position: A: ()	
B: ()	
C: ()	
<u>Post-Operative Classification (Garcia <i>et al.</i>):</u>	
Class: I: ()	
II: ()	
III: ()	
<u>Operation Time (from incision till suturing):</u> () minutes.	
<u>Remarks:</u>	

Figure (1): Impaction case sheet

All of the 200 selected impactions were classified on both position A to C and class 1 to 3 scales of Pell–Gregory classification based on standard periapical radiograph (Table 1).

Table (1): The Pell–Gregory classification⁽⁴⁾

Grade	Criteria
A	The occlusal plane of the impacted tooth is at the same level as the occlusal plane of the second molar.
B	The occlusal plane of the impacted tooth is between the occlusal plane and the cervical line of the second molar.
C	The impacted tooth is below the cervical line of the second molar.
1	There is sufficient space between the ramus and the distal part of the second molar for the accommodation of the mesiodistal diameter of the third molar.
2	The space between the second molar and the ramus of the mandible is less than the mesiodistal diameter of the third molar.
3	All or most of the third molar is in the ramus of the mandible.

All of the impacted teeth were surgically extracted under local anaesthesia obtained by inferior alveolar, lingual and long buccal nerve block injections using 3 ml of 2% xylocaine with 1:80 000 adrenaline

(Septodont Astra, Sweden). The surgical removal of the impacted teeth was performed following the standard procedure for this type of operations.^(10,11)

Following the extraction surgical difficulty was rated according to Garcia *et al.* classification (Table 2). The duration of operation was recorded accurately starting from incision till the suturing of the flap and excluding the time needed for the patient to be anesthetized and the post-operative instructions.

Table (2): Garcia *et al.* Classification⁽⁶⁾

Grade	Criteria
I	Extraction required forceps only
II	Extraction required osteotomy
III	Extraction required osteotomy and coronal section
IV	Extraction more complex

The comparison of surgical difficulty for removal of impacted lower third molars among Pell–Gregory classification, Garcia *et al.* classification and duration of operation was performed according to the chart seen in Table (3).

Statistical analysis of the data was performed using chi-square test utilizing Minitab under Windows program loaded on Pentium III computer. A highly significant difference was considered at $p \leq 0.001$.

Table (3): Comparison of the difficulty of operation among Pell–Gregory, Garcia *et al.* and operation time

Difficulty of Operation	Pell–Gregory Classification	Garcia <i>et al.</i> Classification	Operation Time (Minutes)
Simple	I–A, II–A, I–B	I	≤ 15
Moderate	III–A, II–B, I–C	II, III	16–30
Difficult	III–B, II–C, III–C	IV	≥ 31

RESULTS

Among the 200 vertically impacted lower third molar teeth, 54.50% were considered as simply removed according to Pell–Gregory classification, 47% according to Garcia *et al.* classification and 39% according to the time of operation. Regarding those which were considered as moderate extraction, 34% were recorded under the classification of Pell–Gregory, 47%

with respect to Garcia *et al.* classification and 42% in accordance to the duration of surgical procedure; while the difficult operations recorded the lowest percentages among all the classifications: 11.50% with Pell–Gregory classification, 6% with Garcia *et al.* classification and 19% with the duration of operation. These results were shown in Table (4).

Table (4): Frequency and percentage distribution of the classification systems according to the difficulty of the operations

Classification		Operation		
		Simple	Moderate	Difficult
Pell-Gregory	No.	109	68	23
	%	54.50	34.00	11.50
Garcia <i>et al.</i>	No.	94	94	12
	%	47.00	47.00	6.00
Time of Operation	No.	78	84	38
	%	39.00	42.00	19.00

Table (5) revealed the degree of matching among the three classification systems for the three levels of operations. It is obvious that a greater matching percentage occurred regarding simple than moderate or difficult operations; whereas the difficult operations represented the least matching percentage among the three classificati-

ons. The results presented also in Table (5) showed that there were no statistical significant differences among the three types of classification systems regarding simple and moderate operations. However, a significant difference occurred for the difficult operations only.

Table (5): Frequency and percentage of matching among the three classification systems according to the difficulty of operations

		Pell-Gregory		Garcia <i>et al.</i>		Time of Operation	
		No.	%	No.	%	No.	%
Simple*							
Pell-Gregory	M	-	-	65	69.15	56	71.79
	U	-	-	29	30.85	22	28.21
Garcia <i>et al.</i>	M	65	59.63	-	-	69	88.46
	U	44	40.37	-	-	9	11.54
Time of Operation	M	56	51.38	69	73.40	-	-
	U	53	48.62	25	26.60	-	-
Moderate**							
Pell-Gregory	M	-	-	34	36.17	31	36.90
	U	-	-	60	63.83	53	63.10
Garcia <i>et al.</i>	M	34	50	-	-	58	69.05
	U	34	50	-	-	26	30.95
Time of Operation	M	31	45.59	58	61.70	-	-
	U	37	54.41	36	38.30	-	-
Difficult***							
Pell-Gregory	M	-	-	4	33.33	16	42.11
	U	-	-	8	66.67	22	57.89
Garcia <i>et al.</i>	M	4	17.39	-	-	11	28.95
	U	19	82.61	-	-	27	71.05
Time of Operation	M	16	69.57	11	91.67	-	-
	U	7	30.43	1	8.33	-	-

M: Matched; U: Unmatched.

* $\chi^2= 5.447$ d.f= 2 Not Significant

** $\chi^2= 4.563$ d.f= 2 Not Significant

*** $\chi^2= 14.000$ d.f= 2 Significant

DISCUSSION

The results of the present study showed no significant difference between the three classifications for simple and moderate grade operations indicating that the amount of bone covering the tooth and the depth of impacted tooth were limited which, in turn, lead to a decrease in the time of operation. On the other hand, a significant difference was noted among the three classifications regarding difficult operations. One of the factors which could be related is the patient's uncooperativeness may play a significant role in elongating the duration of some operations which might be simple or moderate. In addition to that, gag reflex may also play the same role in determining the difficulty of operations.^(7,12,13)

There are several advantages for predicting the time that may be spent in the operation: One of the most important advantages is that when we know that certain operations may take a short time we can decrease the amount of local anesthesia to that needed for simple extraction. This advantage is very useful for some patients suffering from some medical problems.⁽⁸⁾ Likewise, when we predict that an operation may take a long time, general anesthesia and / or increase the amount of local anesthesia as well as early morning appointment are preferable.⁽¹⁵⁾

Moreover, when a lengthy period is to be expected pre-operatively we may predict an increase in possible post-operative complications. Consequently, additional equipment, material, effort as well as special home care instructions may be needed.⁽⁹⁾

The results of this study showed that the Pell-Gregory classification is a reliable prediction of surgical difficulty in extraction of vertically impacted lower third molars and in determining the duration of operation. These results were in contrast with those of Garcia *et al.*⁽⁶⁾

CONCLUSION

There is a significant role of time in assessing the difficulty of surgical removal of an impacted third molar tooth and this will help surgeons in scheduling the treatment plan in such patients, as well as taki-

ng the necessary precautions pre-operatively when dealing with difficult operations.

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