

Demographic Factors as Prognostics of Patients' Morbidity Following Wisdom Tooth Surgery

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Abstract

Background: Surgical removal of impacted mandibular third molars is a common procedure in oral and maxillofacial surgical practice with undesirable consequences such as pain and swelling that have a major concern for most patients. This study aimed to investigate the impact of age and gender on postoperative intensity of pain and swelling experienced by patients following mandibular third molar surgery (M₃MS).

Material and Methods: The study involved 46 patients underwent surgical extraction of mandibular third molar under local anesthesia. The visual analogue scale measured pain and swelling for seven consecutive days after surgery.

Results: After M₃MS, patients experienced the most pain severity in the day of surgery, while facial swelling reaching a maximum in the first postoperative day. It was found that the influence of age and gender on the intensity of pain and degree of swelling was insignificant.

Conclusion: Pain and swelling after M₃MS peaked on the day of surgery and the day after respectively with mild to moderate intensity, it subsided gradually to minimal levels on day 7. Short-term outcomes of M₃MS with respect to degrees of pain and swelling were found to be similar, and it seems to be independent of both' age and gender.

Keywords: Pain; Swelling; Morbidity; Oral surgery; Wisdom tooth surgery.

Introduction

Surgical removal of impacted mandibular third molars (M₃M) is a common procedure

in oral and maxillofacial surgical practice [1]. However, it is uncomfortable for patients because of postoperative undesirable consequences such as pain and

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swelling that have a major concern for most patients [2,3]. Oral surgeons should be able to predict the anticipated degree of postoperative discomfort [4], and to follow strategies of managing these drawbacks when they arise. Postoperative complications are directly related to surgical difficulty, which could be predicted preoperatively by classical difficulty scoring scales that based on radiographic variables only [5,6]. However, the recent ones involved additional demographic and clinical variables [7,8]. The degree of pain and swelling following M₃M surgery were reported though out many studies [3,9-14]. Researchers reported that the highest pain intensity following M₃M surgery is within few hours [14-16] or on the day after surgery [11,12]. In contrast, when postoperative swelling is concerned, Studies found it to be in maximum degree in day two [11-13] or three [14,16,17] after surgery.

The aim of this study was to assess the degree of pain and swelling following M₃M throughout the immediate postoperative period, and to investigate the impact of patients' age and gender on these complications.

Material and methods

This study is apart from a previously conducted research [18]. Surgical removal of impacted M₃M were executed in forty-six dental patients who presented to the Department of the oral surgery/The Left specialized dental center, Mosul city, Iraq. The local ethics committee approved the study. All participants were healthy individuals (American Society of Anesthesiologists grade I) with no systemic diseases, and they signed informed consent.

Medically compromised patients, female patients using oral contraceptives or those

aged below 18years were excluded from the study. In addition, those with cognitive or mental disability, and patients who refuse to participate were also excluded. Operations were conducted following the standard protocols under local anesthesia by two expert oral surgeons (A.A., G.M). Postoperatively, amoxicillin 500mg (or alternatives in amoxicillin-allergic patients) and ibuprofen 200mg TID for 5 days were prescribed to all patients. In addition to verbal and written postoperative instructions were given by the operators.

Recording of pain and swelling after surgery: At night of the day of surgery and for 6 consecutive days, participants asked to record the intensity of their pain using the visual analog scale (VAS); which is a horizontal line of 100mm in length with two limits 'No pain' and 'Worst imaginable pain' placed at each end of the line. Similarly, swelling recorded on another VAS with the ends 'No swelling' and 'Worst imaginable swelling'. Scores of pain and swelling were compiled from patients one week later, when they came for suture removal and for evaluation of the surgical site.

Statistical analysis (IBM SPSS Statistic 23): Paired-samples T test, independent sample T test, and Chi-square test used in data analysis. A probability value (P) of less than 0.05 was considered significant.

Results

Among the forty-six patients who expressed an interest to participate in this study, three patients did not return for suture removal. Another three patients (6.52%) were excluded from the study; one did not know how to use rating scale, and two did not complete their rating of pain and/or swelling throughout the postoperative study period. The included patients were 22

male (55%) and 18 females (45%) aged 18-37 years (mean age of 25.8±6.3 years). Right

(n=23) and left (n=17) mandibular wisdom teeth were extracted (Table 1).

No. of patients	Age range (Mean/SD)	Site of M ₃ M		Age group		Sig.	Gender		Sig.
		Right	left	<26	≥ 26		Male	Female	
40	18-37 (25.8/6.3)	15	25	20	20	1	22	18	0.527

Table 1: Number of patients concerning their age and gender. SD=Standard deviation, M₃M: Mandibular third molar, Significant at the 0.05 level (Chi-square test).

By pooling all patients, the mean value of pain reached a maximum at the night of the day of surgery (Day 1); it was moderate and subsided gradually to almost no pain on day 6 (Table 2, Figure 1). In day 1, most of patients (65%) reported moderate severity

of pain. However, two patients (5%) reported no pain and eight patients (20%) reported severe pain (Table 3). There was a statistically significant difference in the VAS scores for pain in day 1 compared with day 2, 3, and 4 ($P<0.028$).

Postoperative period	Pain (Mean/SD)	Swelling (Mean/SD)
Day 1	49.2 (29.2)	26.2 (22.1)
Day 2	32.4 (24.4)	32.6 (23.4)
Day 3	29.7 (28)	31.1 (22.3)
Day 4	15.9 (18.2)	20.9 (16)
Day 5	11.8 (16.1)	13.3 (16.3)
Day 6	4.3 (11.3)	10.2 (13.9)
Day 7	4.5 (13.4)	4 (12.5)

Table 2: Postoperative pain and swelling mean values (VAS).

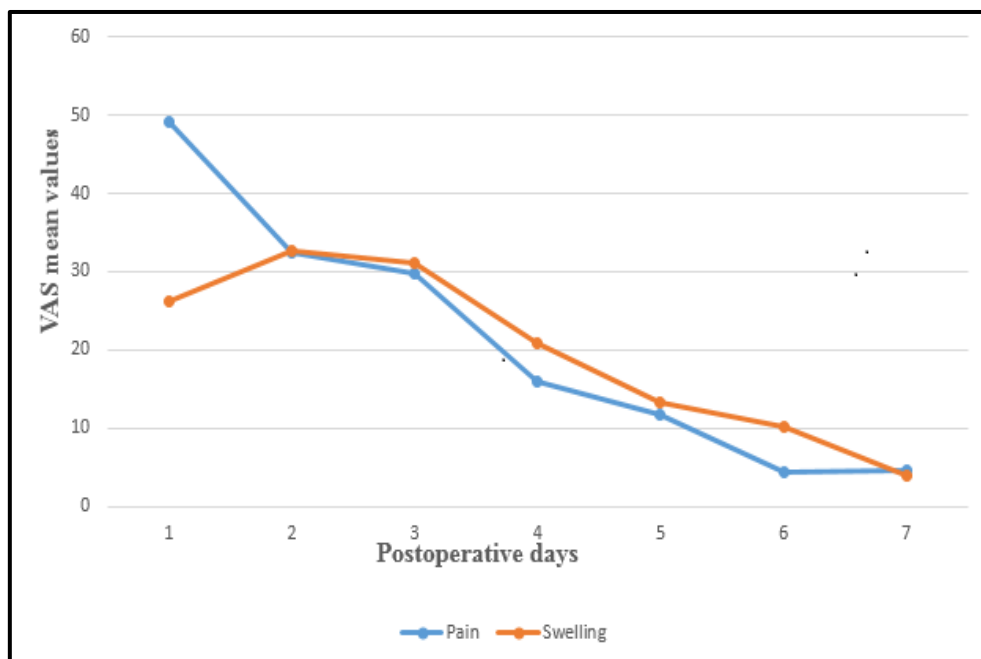


Figure 1: Postoperative pain and swelling values after M₃MS.

Postoperative complain	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
No pain	5	7.5	35	50	57.5	77.5	77.5
Mild pain	10	62.5	35	47.5	40	20	20
Moderate pain	65	30	27.5	0	2.5	2.5	0
Severe pain	20	0	2.5	2.5	0	0	2.5
No swelling	12.5	7.5	7.5	7.5	42.5	57.5	70
Mild swelling	57.5	62.5	60	90	55	40	27.5
Moderate swelling	30	30	30	0	2.5	2.5	0
Severe swelling	0	0	2.5	2.5	0	0	2.5

Table 3: Percent (%) of patients with postoperative pain and swelling.

Majority of patients (87.5%) recorded mild to moderate facial swelling in the day of surgery (Table 3). The maximum mean of VAS scores was in the first postoperative day (Table 2) which is significantly different from the following postoperative days ($P < 0.018$). Swelling subsided gradually though out the following postoperative days, and about 70% of patients had no swelling on the sixth post-operative day

(Table 2, Figure 1). Female patients reported more postoperative pain and swelling than males did. However, there were no significant differences between the two groups (Table 4, Figure 2).

Similarly, no significant difference was reported between young and old patients with respect to postoperative pain and swelling (Table 4, Figure 3).

Pain		Swelling	
Young vs. old	Male vs. female	Young vs. old	Male vs. female
0.673	0.239	0.462	0.143

Table 4: Statistical significance* in age and gender concerning postoperative pain and swelling.
*Significant at the 0.05 level (Independent sample T test).

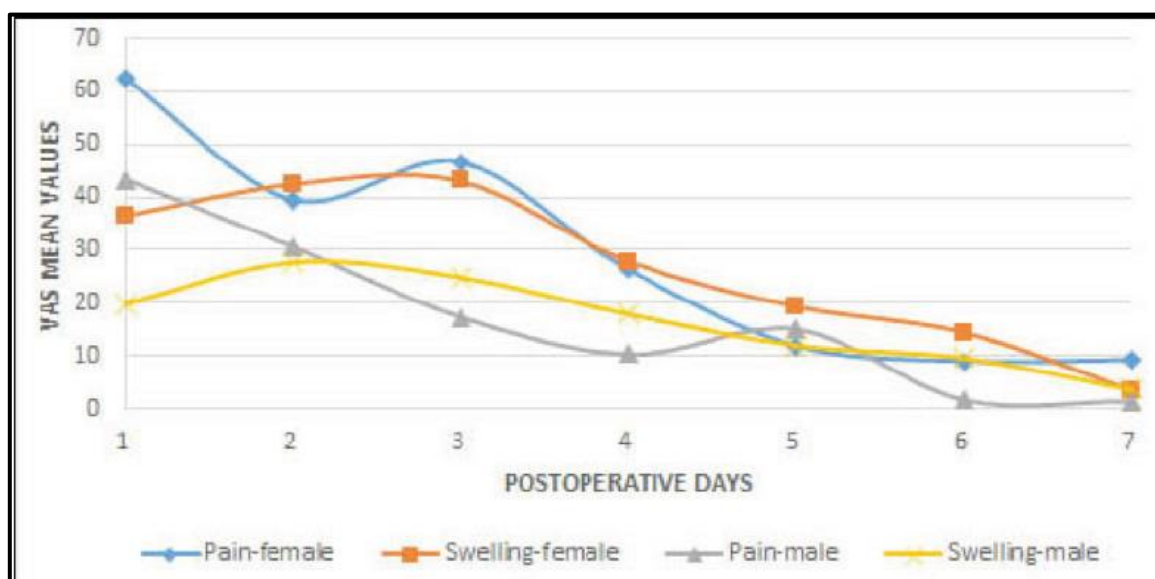


Figure 2: Gender-related postoperative pain and swelling values following M₃MS.

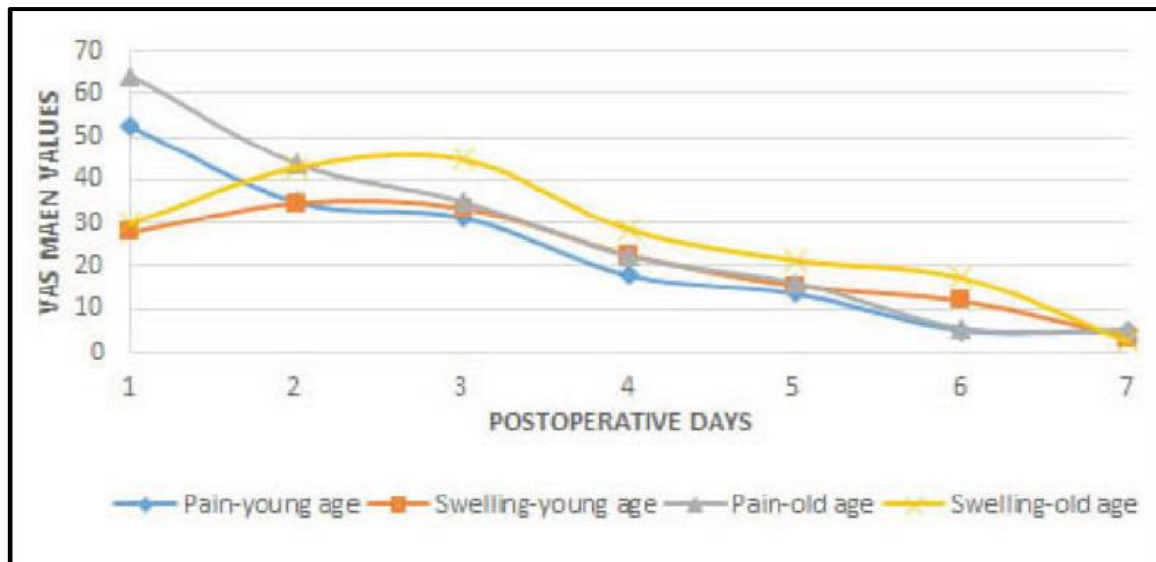


Figure 3: Age-related postoperative pain and swelling values following M3MS.

Discussion

Concerning M3M surgeries, the impact of patients' age and gender on postoperative morbidity is somewhat conflicting. Some studies showed no effect of age [19-22] or gender [21,23]. On the contrary, others found that age [19,24-26] and gender [19,24, 27,28] are prognostic factors of postoperative patients' discomfort. In this study, VAS used to evaluate pain and swelling. It is one of the most frequently used subjective method to assess these parameters [3,14].

Although it is an effective and reliable tool [2,29], however, it requires the patient's concentration [30] and be ability to equate the amount of experienced discomfort with the length of line on the scale [31]. For that reason, only patients aged 18 years or over were included in our study. In spite of that, some of our participants found VAS difficult to use.

Different cut points on the VAS have been considered to categorize discomfort [32]:

1. (0-4mm): No pain/swelling

2. (5-44mm): Mild pain/swelling
3. (45-74mm): Moderate pain/swelling.
4. (75-100mm): Severe pain/swelling.

Patients rated their experienced pain and swelling in this study for seven consecutive days, starting on the day of surgery to give detailed data related to the immediate postoperative discomfort, this was in conjunction with the work done by another researchers [13,14,33,34].

Researchers found difficulty in securing patient collaboration when conducting clinical trials [35,36]. In the present study, 13% of the patients failed to use and/or complete the VAS for pain and swelling for the whole period of study. M3M surgeries involves trauma to the soft and hard tissues that results in inflammatory response manifested as various complications like pain and swelling [37]. In the present study, the maximum pain intensity was on the day of surgery, which was in agreement with other studies [14-16]. Two patients (5%) reported no pain on day 1, and one remained pain free throughout the period of the study, which may be attributed to a high

pain threshold or an under estimation of pain intensity.

The distribution of patients' VAS scores for pain was skewed to the right: 25% of patients scored 0-46; 50% scored 0-54; and 75% scored 0-70. The mean VAS score was 49 over 100 indicating that the pain intensity perceived by patients on day 1 after M3M surgery is moderate giving a good correlation with the previous studies with regards to pain intensity, where VAS scores of 4, 4.8, and 5 over 10 have been reported [1,11,12]. Most of patients suffered from swelling that reached the maximum on the first and second postoperative days; this was consistent with other studies [10,11,13,14]. In the first postoperative day, the mean of VAS scores of swelling was 32 over 100, about 92.5% of participants had mild to moderate swelling. One patient reported severe swelling (VAS score was 100 over 100), an over estimation of swelling may be attributed to such an extreme value. In other studies, comparable values (36 over 100; and 2.6 over 10) have been reported [38,39] indicating that a mild to moderate

intensity of swelling could be perceived by patients following M3M surgeries. With the line of other studies [21,22], patient's age had a limited impact on postoperative intensity of pain and swelling. This could be related to the narrow range of patient ages that may hide the debilitating effect of age, since third molar extraction is mostly performed in young and middle-aged patients [40]. Also, consistent with our findings, researchers found no correlation between gender and the intensity of postoperative pain and swelling [21,23]. This study tells that the values of pain and swelling after M3M surgeries peaked on days 1 and 2 respectively with mild to moderate intensity, then subsided gradually to minimal values on day 7. However, the small sample size of this study along with degree of surgical difficulties of executed cases put difficulties to have a clear conclusion concerning the effect of patients' age and gender; therefore, more studies are recommended. Moreover, careful consideration should be given to other factors like patient's anxiety from dental procedures, oral hygiene and drug use.

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