

The efficacy of ibuprofen and naproxen on swelling following surgical removal of impacted mandibular third molar

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ABSTRACT

In a double blind study the effect of ibuprofen and naproxen on swelling following surgical removal of impacted mandibular molar (M3) was evaluated on (48) patients. The patients were divided into three groups according to medication given for each group. The postoperative swelling at the area of surgery was measured by two methods namely, computerized photography and conventional facebow. The measurements performed at day (2) and day (7) postoperatively. The results showed that both ibuprofen and naproxen not reduced the expected swelling significantly in day (2) post-operatively comparing to control placebo group, but significant difference was noticed between the effect of ibuprofen and control group in day (7) post-operatively.

Key Words: Impaction, postoperative swelling, ibuprofen, naproxen.

الخلاصة

تم تقييم تأثير الأيبوبروفين و النابروكسين على الألم بعد إزالة الأرحاء السفلية الثالثة المنظرة باستخدام طريقة إخفاء الأدوية. شملت الدراسة على (٤٨) مريضاً. قسم المراجعون إلى ثلاثة مجاميع حسب الأدوية المستخدمة لكل مجموعة. قيس الورم ما بعد العملية بطريقتين باستخدام آلة التصوير الرقمية الحاسوبية و باستخدام القوس الوجهي. قيس الورم في انيوم الثاني واليوم السابع ما بعد العملية. أكدت النتائج أن الأيبوبروفين والنابروكسين ليس لهم تأثير معنوي على الورم في اليوم الثاني مقارنة بالمجموعة الضابطة، ولكن الأيبوبروفين له تأثير معنوي على الورم في اليوم السابع مقارنة بالمجموعة الضابطة.

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INTRODUCTION

Removal of impacted mandibular third molar either partially or completely impacted involves trauma to soft tissue and bone, which results in a postoperative inflammation, significant pain, swelling and trismus. The main factor responsible for swelling is local edema caused by accumulation of fluid exudate in the interstitial tissue spaces. Many approaches have been made to overcome or at least to reduce the severity of postoperative problems and localize the extent of inflammatory process. Of these, antibiotics^(1,2) or glucocorticosteroids^(3,4). Anti-histamine as well used^(5,6,7). The use of non-steroidal anti-inflammatory drugs (NSAIDs) were studied^(8,9).

Ibuprofen and naproxen are both of (NSAIDs) belong to propionic acid derivatives. They are used clinically in treatment of rheumatoid arthritis, osteoarthritis⁽¹⁰⁾ and used post surgically to reduce swelling and pain⁽¹¹⁾. Efficacy of flurbiprofen is less to reduce postoperative swelling in (M3) compared to methyl prednisolone⁽¹²⁾, while other study showed That combination of flurbiprofen and ibuprofen with methyl prednisolone is more effective for swelling suppression than either one used alone⁽¹³⁾.

This study was designed to evaluate the effect of ibuprofen and naproxen on swelling following surgical removal of (M3).

MATERIALS AND METHODS

Majority of patients upon whom the study was made was students in the College of Dentistry, University of Mosul. The patients were examined clinically for the presence of impacted or partially erupted (M3). This was confirmed by standard periapical radiograph to determine the depth and direction of impaction and also the relation of the roots to inferior dental canal and relation to standing second molar.

Following clinical and radiographical examination The criterion for patient selection were cited These include unilateral impaction of (M3) with safe distance from inferior dental canal and show vertical or mesioangular direction, also symptom free at day of operation.

The selected patients also were band for receiving analgesic, anti-inflammatory or antibiotic for at least (7) days prior to operation. The patients also should be medically fit and no contra indicated (NSAIDs). These patients instructed to follow up at day (2) and day (7) postoperatively to measure the degree of postoperatively swelling.

Classical method for surgical removal of (M3) was performed on each patient under local anesthesia which involve, raising of mucoperiosteal flap, bone removal and tooth sectioning if needed and removal of the tooth then suturing of the flap following through washing of the surgery area.

Two methods were used for the measurement of postoperative swelling. The computerized photographs and facebow and the measurements were done to the nearest mm and both data were compared statistically to determine the accuracy of the two methods.

In photographical method a digital computerized camera (Kodak Dc 215 zoom digital camera) was used. The patient head was positioned in the cephalometer and informed to look forward. The distance of two feet between the patient chin and the camera zoom was adjusted on the camera stand. Then analysis of the photographs taken by drawing the following imaginary lines⁽¹⁴⁾ as follow (Figure 1):

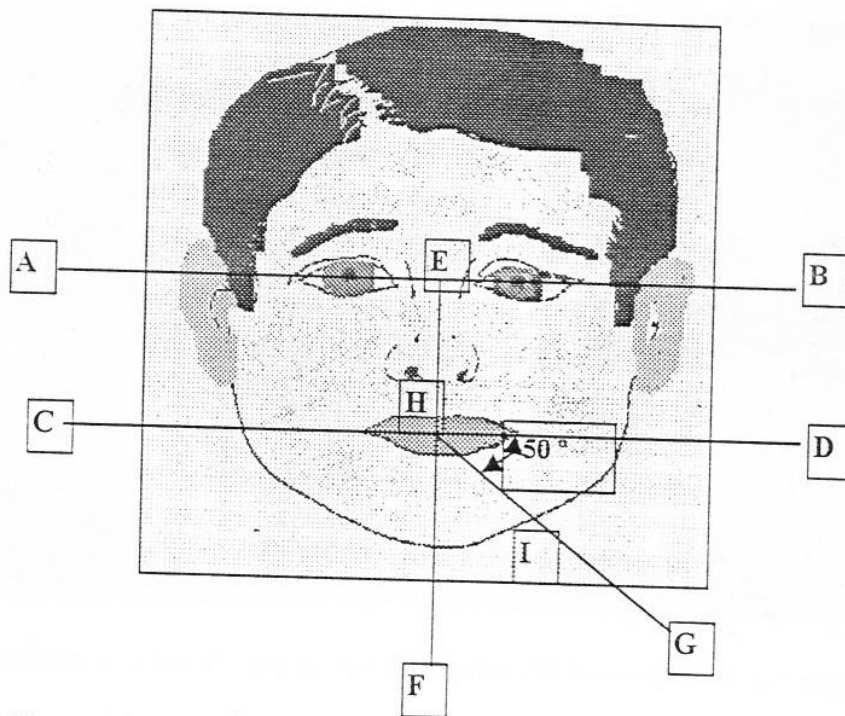


Figure (1): Diagram illustrated analysis of computerized photograph

The horizontal line was drawn at the level of a lower margin of the pupils of the eye (AB). Another line was drawn perpendicular to the first at the midline of the face (EF). The midline was determined to be half at the inter-pupillary distance (E). The third line was drawn parallel to the first at the level of the corner of the mouth (CD) and the last line was drawn at (50) degree from the horizontal at the midline (HG). Measurements were made on this line measuring the distance from the intersection of the horizontal line through the corner of the mouth and the midline (H) to the end point of the face (I). While in the facebow method the sliding pointer in operated side is adjusted to the right angle of the cheek to a point, which is localized by the connections of two imaginary lines. The first line is drawn from the angle of the mandible to the angle of the mouth at the commissar about (3) cm from the beginning of this line. The second line is drawn from the lower notch of the tragus of the ear to the ala of the nose and (3) cm, from the lower notch of the tragus a perpendicular line is made to the first one. This point is considered a fixed reference point For subsequent measurements at day (2) and day (7) post operatively (Figure 2).

This study is considered as double blind for (50) patients in which the drugs coded as A, B and C. The code is not broken until complete the practical work and analysis of the data and classified as follows:

- Group A received drug code A consists of (20) patients (12 males, 8 females).
- Group B received drug code B consists of (20) patients (12 males, 8 females).
- Group C received drug code C consists of (10) patients (5 males, 5 females).

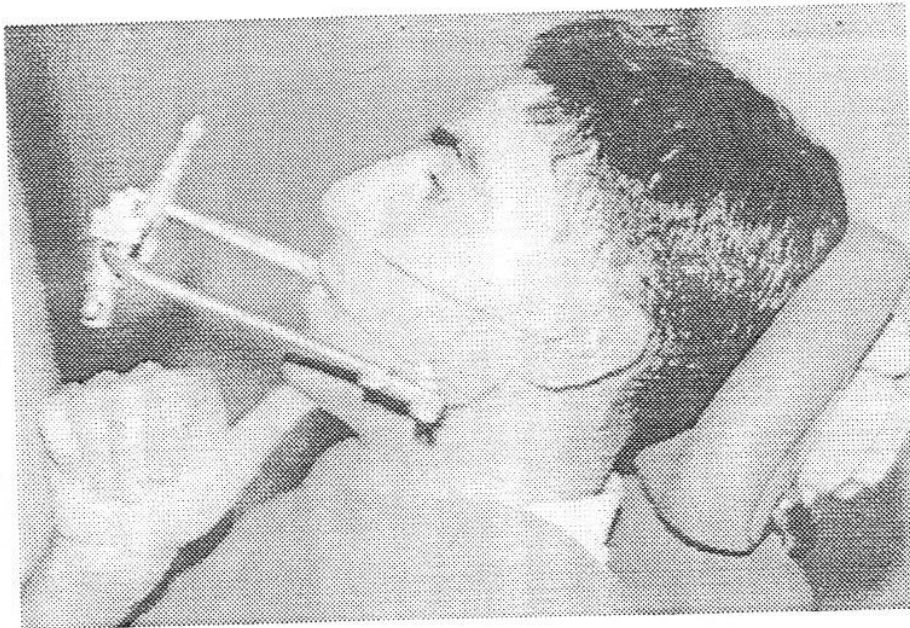


Figure (2): Measurement of postoperative swelling clinically by facebow

RESULTS

The numbers of patients operated on in the present study were (50), of these (2) cases were excluded because of lacking the follow up data. Therefore analysis of data for (48) patients was performed. As the study is considered a double blind, the key of investigating drugs which were blindly given, was known as follows: Naproxen was given for group A, [Naproxen (as sodium) 250 mg HIKMA pharmaceuticals, Jordan], Brufen was given for group B, [Brufen 200 mg SDI-Iraq], and placebo was given for group C.

Table (1) showed a sex distribution and mean age of the patients, while table (2) showed that at day (2). There were no significant differences in the reduction of swelling between the control group and medicated groups. Also, no significant differences in the reduction of swelling between NTG and BTG in day (2) postoperatively. While in day (7) postoperatively there were no significant differences in the reduction of swelling between the control group and NTG. While a significant difference in the reduction of swelling between the control group and BTG was noticed ($p < 0.05$).

Table (1): Sex distribution and mean age of patient according to drugs used

	NTG		BTG		CTG		Total
	Male	Female	Male	Female	Male	Female	
No.	11	8	8	1	5	5	48
Mean Age	24.8		24.4		24.9		24.9
Range	16-41		19-33		20-31		16-45

NTG= Naproxen treated group. BTG=Brufen treated group. CTG=control treated group.

Table (2): Comparison of swelling between medicated and control group

		Postoperative Day			
		2 Days Swelling		7 Days Swelling	
		Mean	± SE	Mean	± SE
Drug Tested	CTG	2.70 A	0.15	1.40 A	0.19
	NTG	2.84 A	0.38	0.94 A	0.24
	BTG	2.43 A	0.37	0.75 B	0.20

Vertical the group which shared the same letter are not significantly different at $p=0.05$ according to Duncan test.

Table (3) showed that data of swelling measurement obtained postoperatively by facebow and computerized photograph and t-test was applied on the data obtained from both measurements. The results showed no significant difference was noticed between the data of the two methods ($p>0.05$).

Table (3): Comparison of swelling between facebow and computerized methods of measurements

Facebow Measurements (mm)		Computerized Photograph Measurement (mm)		t-value
Mean	± SE	Mean	± SE	
1.99	2.20	2.90	2.23	2.02*

* Non-significant, $p>0.05$

DISCUSSION

Surgical removal of M3 is inherently a traumatic one that involves both hard and soft tissues. Certain complains may be raised and can be classified into local and general complains⁽¹⁵⁾. The general complains could be excluded study since the patients operated on were healthy in this study. The swelling developed post operatively in such surgical operation due to vascular changes in response of tissue to trauma by the effect of chemical mediators released in the area of inflammation and the released chemical mediators as well amplify the initial inflammatory response⁽¹⁶⁾. The degree of postoperative swelling accordingly is unpredictable even in the same surgical operation⁽¹⁷⁾. The inflammatory process is complex process involves many mechanisms⁽¹⁸⁾. In this study namely naproxen and brufen evoke anti-inflammatory effects only by inhibition of PGE2 peripherally⁽¹⁰⁾. Therefore other mediators involve in the swelling are still active hence no difference were noted between the three groups at day (2) postoperatively.

Brufen has the ability of reducing the tissue level of immune reactive bradykinin (IBK) immunoreactive PGE₂ (IPGE₂) and immuno reactive substance -p- (ISP) more than naproxen ⁽¹⁹⁾ accordingly brufen shows significant differences of swelling reduction at day (7) postoperatively.

Two methods of swelling evaluation were adopted in this study namely computerized photograph and conventional facebow apparatus. Computerized photography method being sophisticated, expensive and majority of female patients were unwilling to have their photographs taken, therefore, the method was limited to only (10) patients. On these patients a conventional facebow method was also applied. Statistical analysis showed that there were no significant differences between the two readings. Thus, the swelling in the remaining patients was evaluated by facebow method only. In conclusion for patients undergoing surgical removal of (M3), (200) mg of ibuprofen (3) times daily following surgery is preferable in order to reduce the expected postoperative swelling.

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