

EFFECT OF GENDER ON POSTOPERATIVE MORBIDITY FOLLOWING LOWER THIRD MOLAR SURGERY

By

Nzube F. Chukwuneke

*Department of Oral and Maxillofacial surgery
University of Nigeria Teaching Hospital Enugu*

SUMMARY

Objective:

The effects of gender on pain, swelling and trismus was evaluated in eighty patients of both gender referred for extraction of impacted lower third molar at the Oral and Maxillofacial Surgery Clinic of the University of Nigeria Teaching Hospital, Enugu.

Patients and Methods:

Eighty patients of both gender, randomly divided into two equal groups, participated in this study. Group 1 (n= 40) were the male patients while group 2 (n= 40) were the female patients. Their ages ranged between 18 and 40 years (mean 26 \pm 6.4). The mean preoperative mouth openings between the two groups were similar.

All the patients were treated under the same surgical and postoperative protocols. The lower third molars were extracted using the buccal approach method. The length of surgical intervention was recorded as the time between the first incision and the placement of the last suture. Pain, swelling and trismus were evaluated at 24 hours, 72 hours and 5 days postoperatively.

Results:

The result of the study indicates that the female patients had a statistically significant shorter operating time and experienced less swelling than the male patients ($p < 0.05$). Pain was significantly more in the female patients than in the males ($p < 0.05$). There was no significant difference ($p > 0.05$) between the two groups as regards trismus.

Conclusion:

The inflammatory response following third molar surgery increases within 24 – 72 hours after surgery with the male patients exhibiting more inflammatory swelling than the females. However, women appear to be more sensitive to pain than men.

Keywords: *third molar surgery, gender, morbidity*

Correspondence Address:

Dr F N Chukwuneke

Oral and Maxillofacial Unit

Faculty of Dentistry

UNTH, Enugu.

Email: ichiefn2002@yahoo.com

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INTRODUCTION

Pain, swelling and trismus is the most common cause of discomfort and postoperative morbidity after the surgical removal of impacted lower third molar under local anaesthesia¹⁻². Patients' complaints of pain, swelling and limitation in mouth opening associated with inflammatory response following lower third molar surgical extraction is an important factor affecting their daily life³.

Assessment of the effect of third molar surgery on a number of measures of health care outcome within the first postoperative week which included level of physical discomfort, oral and vocal function, patient's perception of their appearance and social interaction showed that within the first postoperative week some patients experienced deterioration in their quality of life that extends beyond the traditionally recognized side effect and which shows little improvement in the first postoperative week⁴. Decision analysis studies for lower third molar surgery show respondents and patients preferring the discomfort of pericoronitis to the risk of complication and postoperative morbidity considering the "cure" worse than the "disease"^{5, 6}. For this reason, many clinicians and oral surgeons are concerned about the changes brought about by these discomforts on the quality of life of patients who undergo the surgical removal of impacted lower third molar^{5,6,7,8,9}.

As a general rule, the more difficult and time consuming the surgery is the more difficult and prolonged the postoperative recovery period^{7, 8, 10}. Gender factor is an important factor affecting the surgical outcome after third molar surgery because more time is spent while working on male patients than in female patients and as such less postoperative discomfort is usually observed in female patients^{11, 12}.

Pain is a very important postoperative discomfort expected after third molar surgery.

The post-surgical pain begins when the effect of the local anaesthesia subsides and reaches its maximum intensity during the first 12 hours postoperatively¹². Pain requiring analgesics for control rarely extends beyond 48 hours¹³. Women appear to be more sensitive to pain than men¹²⁻¹⁵. Prolonged severe pain after third molar surgery could be sequel to alveolar osteitis or dry socket and occurs in between 3% and 25% of the study population¹³.

Facial swelling usually reaches its maximum 48-72 hours after surgery and begins to subside on the third or fourth day. It usually resolves by the end of the week. Increased swelling after the third day is an indication of infection rather than post-surgical oedema¹².

Several studies have been carried out on third molar surgery in Nigeria, but none was directed on the effect of gender factor on postoperative morbidity. The purpose of this study therefore, was to evaluate the effect of gender on postoperative pain, swelling and trismus which occur after third molar surgery.

PATIENTS AND METHODS

Eighty patients with impacted lower third molars referred for surgical extraction participated in this study. Ethical clearance was obtained from the ethics committee of the University of Nigeria Teaching Hospital, Enugu. All the patients were informed of the risks and benefits of the operation after which they signed operation consent. The patients were free from pain or any other inflammatory symptoms such as swelling, hyperaemia or decreased mouth opening due to a temporomandibular joint (TMJ) problem at the time of surgery. None of the patients had any history of allergy to the drugs used in this study.

They were 40 males (Group 1) with mean age of 27 years ± 6.2 and 40 females (Group 2) with mean age of 26 years ± 6.8 . There were 30 mesioangular, 20 vertical, 18 horizontal and 12 distoangular impactions all divided

uniformly among the two groups. There was no significant difference ($p > 0.05$) in the preoperative mean mouth opening between the two groups.

The standard surgical procedure was the same in all cases and was performed by the same surgeon. Antibiotic prophylaxis in the form of 2g of amoxicillin was administered one hour before the surgical procedure. The duration of surgical procedures were recorded as the period between the first incision and the last suture in minutes.

In the postoperative period, a non-steroidal anti-inflammatory drug (Ibuprofen 400mg) was prescribed every 12 hours for 4 days. All the patients were given similar postoperative instructions and placed on a soft diet for the first 24 hrs. Wound healing was uneventful in all patients.

Pain was evaluated in the preoperative and postoperative periods using a visual analogue scale in combination with graphic rating scale. Before and after operation, predefined values composed of visual analogue scale of 10 units concerning preoperative and postoperative pain were given to the patients. Patients entered the degree of pain on the records given to them 24 hrs, 72 hrs and 5 days postoperatively making reference to the corresponding clinical situations (Table 1). The degree of intensity was determined as mild, moderate and severe.

Table 1

Pain scores on visual analogue scale (VAS) with corresponding clinical situations

<p>Mild</p> <ol style="list-style-type: none"> 1. No pain when patient is distracted 2. Patient feels pain even when distracted 3. Patient has slight pain on operation site
<p>Moderate</p> <ol style="list-style-type: none"> 4. Patient feels pain intermittently 5. Pain is present but does not interfere with patient's normal oral function 6. Pain slightly affects patient's normal oral function

Severe

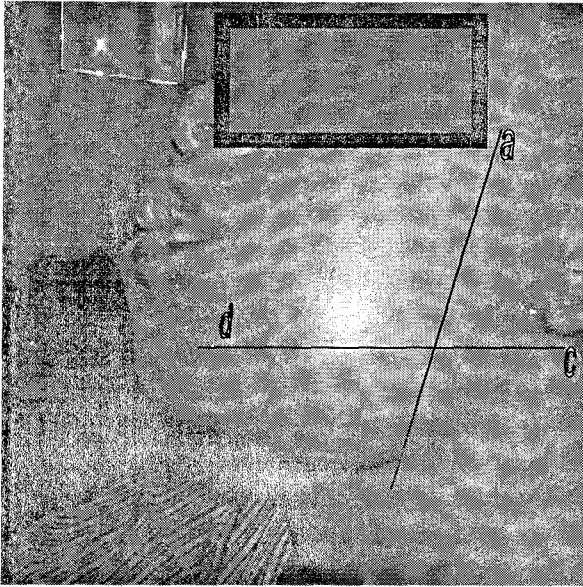
7. Patient is disturbed by pain but could carry out his or her normal daily activities.
8. Patient is forced to abandon his or her normal daily activities
9. Pain is intensified and patient forced to abandon every type of activity.
10. Pain is as bad as it could be.

Trismus was evaluated by measuring the distance between the mesial-incisal edges of the upper and lower right central incisors at maximum mouth opening in centimetres with dental callipers before the surgical procedure and evaluated at 24 hours, 72 hours and 5 days postoperatively.

The evaluation of the facial swelling was performed using a horizontal and vertical guide with a tape on four reference points: tragus, outer corner of the mouth, outer canthus of the eye and angle of the mandible (Fig. 1). The horizontal measure corresponds to the distance between the outer corner of the mouth and the tragus. The vertical measure corresponds to the distance between the outer canthus of the eye and the angle of the mandible. The arithmetic means of the two measurements determines the facial measure.

The percentage of facial swelling was obtained from the difference of the measurements made in the preoperative and postoperative period, dividing the result by the value obtained in the preoperative period and multiplying it by 100. The evaluation of the postoperative swelling was done at 24 hours, 72 hours and 5 days.

Statistical test of significance was performed using the analysis of variance (ANOVA) technique and student t- test. The level of significance was set at 0.05 where $p \leq 0.05$ is considered significance and $p > 0.05$ non significant.

Fig. 1 Evaluation of Facial Swelling

RESULTS

Table 2 Test of significance for pain, swelling and mouth opening in 24 hrs.

Variables	Males (n = 40)	Females (n = 40)	t-value	p-value
Mean % of facial swelling	13.2	7.7	3.4	p < 0.05
Mean pain scores	5.9	6.8	2.2	p < 0.05
Mean % of mouth opening	32.7	29.4	1.5	p > 0.05

Swelling

As shown in table 2, at 24 hours postoperatively the male patients had more facial swelling (13.2%) than the female patients (7.7%). A greater facial swelling was still observed in the male patients than in the female patients at the 72 hours postoperative evaluation (Table 3). Table 4 presents the fifth day evaluation which shows a drastic reduction in facial swelling in both groups: the males still showed greater residual facial swelling ($p < 0.05$) than the females.

Table 3 Test of significance for pain, swelling and mouth opening between the 2 groups in 72 hrs.

Variables	Males (n = 40)	Females (n = 40)	t-value	p-value
Mean % of facial swelling	5.3	3.9	2.6	P < 0.05
Mean pain scores	3.5	3.7	2.8	P < 0.05
Mean % of mouth opening	49.6	54.3	1.4	p > 0.05

Pain

The intensity of subjective pain was moderate in the male patients but severe in the females at 24 hours evaluation period. As shown in table 2 the difference between the sexes was statistically significant ($p < 0.05$). At the 72 hours evaluation period (table 3), analysis of variance indicates that the subjective feeling of pain remained different in the two groups/sexes ($p < 0.05$). By the 5th day (table 4), pain scores had markedly reduced in both groups.

Trismus

There was marked trismus 24 hours postoperatively (table 2), the differences between the sexes not being statistically significant ($p > 0.05$). However, at the 72 hours evaluation, there was already substantial increase in the degree of mouth opening in both sexes (table 3), and this had further increased by the 5th day evaluation (table 4). No statistically significant difference was observed in the degree of trismus between the sexes at any period.

Table 4

Test of significance for pain, swelling and mouth opening between the 2 groups in 5 days

Variables	Males (n = 40)	Females (n = 40)	t-value	p-value
Mean % of facial swelling	3.2	2.7	0.9	p > 0.05
Mean pain scores	1.1	1.1	0	p > 0.05
Mean % of mouth opening	73.7	81.7	1.2	p > 0.05

Duration of Surgical Procedure

The mean duration of surgical procedure was 31 minutes in the males and 28 minutes in females.

DISCUSSION

Gender is an important determinant of morbidity following lower third molar surgical procedures. Peterson¹² had observed that when impacted teeth were removed in females, the surgery was almost always less difficult to perform and post surgical discomfort was always minimized. However, many authors^{14,16,17,18} have observed that postoperative morbidity in the form of pain seems to be more among women while swelling and trismus are more among male patients. Herpy and Goupil¹⁹ in a 6-month prospective study compared post surgical complications following third molar surgery between males and females (staffs and residents in Hawaii, United States of America) confirmed that the patients sex influenced complication rates. This is similar to the findings of this study.

In this study the male patients had a higher surgery time (31 minutes) than the female patients (28 minutes). Renton et al²⁰ similarly observed that gender factor contributed to difficulty at surgery that resulted in increases in the duration of surgical procedure. Similar studies by Peterson¹² and Benediktsdoir et al⁸ found that extended operation time occurred with increase in patient's age and sex. It was noticed in this study that increase in operation time was associated with increase in postoperative discomfort experienced by the patients. However, when comparing the postoperative morbidity between the male and female patients in this study, it was found that the degree of trismus did not vary between the sexes while swelling was higher in male patients. Pederson²¹ observed that neither swelling nor trismus is correlated with the length of surgery and that the size of swelling was not related to the degree of trismus or

postoperative pain. He opined that postoperative pain was the main reason for reduced mouth opening after third molar surgery.

Female patients had higher pain scores than the male patients. This is in consonance with reports in the literature^{14,15,17,18}. It is however, important to note that there is no standard objective instrument for measuring pain for comparative analysis of pain^{22,23}, as pain is a subjective phenomenon²⁴. The three pain variables assessed in studies, which include pain threshold, pain tolerance, and pain intensity are all influenced by the patient's reaction¹⁸. Women are generally seen as the weaker sex physically. That may explain the greater pain sensitivity among the female patients.

In conclusion, this study has shown that gender has influence on postoperative morbidity following lower third molar surgery. Although facial swelling occurs more in men than in women, the latter seem to be more sensitive to pain than men.

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