



MESIOANGULAR MANDIBULAR THIRD MOLAR IMPACTIONS IN ADULTS: RELATIONSHIP OF OPERATIVE TIME ON INFLAMMATORY COMPLICATIONS

Dental Science

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ABSTRACT

Introduction: The present study was done to evaluate the patient's factors and the tooth factors during the surgical procedure of mandibular third molar impactions and its relationship with pain, swelling and trismus. These three postoperative complications are the most common ones as per the known literature and require careful study and interpretation with regard to patient factors

Materials & Methods: 100 Consecutive patients in the age group of 18 to 49 years having mesioangular impacted teeth in mandible, referred to the oral surgery department and full filled the following inclusion criteria were recruited in the study

Results: The difference between the operative times was statistically significant on day 2 and 5 but not significant on day 7 for trismus and swelling. There was an increase in size of swelling and more trismus with increasing operative time.

Conclusion: Inflammatory complications after third molar surgery still remain an important factor at the early postoperative periods. The outcome of the third molar operations such as pain, swelling and mouth opening depends on the characteristics such as depth of impaction and operative time

KEYWORDS

Mesioangular impactions, pain, swelling, trismus.

Introduction

The mandibular third molar surgery is one of the most common surgical procedures in oral surgery.¹ Inflammatory tissue reactions commonly noted are pain swelling and trismus.^{2,3} The main reason behind this is the surgical procedure. 4 This affects the quality of life of the patient and results in restricted daily activities.^{3,4}

The postoperative outcome is influenced by various factors, which can be categorized as immediate and late complications.^{2,3} Pain, swelling and trismus are considered as immediate tissue reactions. Age of the patient, oral hygiene maintenance, type and depth of impaction, density of surrounding bone, design of incision and duration of surgical procedure also plays a vital role in these complications.⁵⁻⁹

A systematic review of the literature showed that operative time of surgical procedure and depth of impaction were one of most common factors that affected the postoperative outcome.¹⁰ Obimakinde OS et al 11 findings showed that at greater depth, mandibular third molar impaction result in more post operative inflammatory tissue reactions. Some of the studies have been done before to evaluate postoperative complications after mandibular third molar disimpaction but these studies did not account for the effects of different variables on post-operative outcome were not completely studied.¹¹⁻¹³

Impacted lower third molar was classified by winter's classification in our study based on a periapical radiograph or orthopantomograph.^{14,15}

Definition of operating time varies according to different studies. We define the operative time as the time taken from giving the incision till the time the last suture is placed in our study.

The present study evaluates the patient's factors, which contribute to operative and tooth factors during the surgical procedure of mandibular third molar impactions and its relationship with pain, swelling and trismus.

Materials and Methods

100 patients in the age group of 18 to 49 years having mesioangular impacted teeth in mandible, referred to the oral surgery department and full filled the following inclusion criteria were recruited in the study.

Inclusion criteria:

- Patients with impacted mandibular third molar (mesioangular) and without systemic disease (Winter's classification, Pell and

Gregory Class I-B)

- No contraindication to use routine medications.

After the standard painting and draping, the classical inferior alveolar and long buccal nerve block technique was used to gain effective anaesthesia at the site of surgery with 1: 2, 00,000 lignocaine with adrenaline. A standard ward's incision was used. Osteotomy was carried out with a flat fissure bur (S.S.White, No 701) along with constant irrigation with saline. Tooth was removed and followed by socket cleaning. Tooth sectioning was done when needed. After achieving proper hemostasis, flap was repositioned and sutured with 3-0 black braided silk. The following Post operative instructions were given.

- Ice pack application for 6 hrs after surgery, alternating 5 min of application with 5 min pause.
- Soft diet for 3 to 4 days and 0.12% Chlorhexidine twice daily after diet.
- Cap. Amoxicillin with clavulanic acid 625 mg/Tab. Diclofenac, paracetamol and seratopeptidase, thrice a day for 5 days.
- Patients were given a card to note the pain and swelling score daily
- Patient was also called for follow up on 2nd, 5th and 7th postoperative day
- Sutures were removed on 7th day of surgery.

Evaluation Criteria:

The following parameters were recorded.

Operative time (OP):

The operation time was noted from the start of surgical intra oral incision at site of impacted third molar up to completion of suturing at surgical site with a stopwatch. Operative time was divided in four groups.

Group 1: ≤20 Minutes, **Group 2:** 21-25 Minutes, **Group 3:** 26-30 minutes, and **Group 4:** 30-40 Minutes

Mouth Opening (Trismus):

Maximum interincisal distance (MID) was used as the index of trismus. Mouth opening was calculated by measuring the inter incisal distance between the upper and lower left central incisor on the 2nd, 5th and 7th days after surgery by Boyle's gauge-a venire calibrated caliper. Three readings were taken for each patient and average was determined.

Pain (VAS score):

Subjective method of visual analogue scale was used for evaluation of pain. The pain rating was subdivided into 5 groups varying from no pain to extreme pain (Table 1). Each patient was asked to fill the record everyday on pain rating scale for seven days, except on the 2nd, 5th and 7th days. On those days the patient was called for follow up and the card was filled by the doctor in the Department.

Table 1: VAS scale to evaluate pain : Reference values given to the patients.

0	No pain	The patient feels no ill effects
1	Slight pain	No pain if the patient is busy or distracted
2	Mild pain	Patient feels pain even if busy in some activity
3	Moderate pain	The patient is disturbed but can continue with normal activities
4	Severe pain	The patient is very disturbed and cannot continue with normal activities
5	Extreme pain	The patient is very disturbed and has to even abandon normal essential activities

Swelling:

It was assessed by using following points on site of surgery. First point corresponded to horizontal line joined outer corner of the mouth and pogonium to the midline of the tragus of the ear lobe [AC, AD], while other vertical line joined from outer lateral canthus of the eye and inferior point on mandibular angle [BE] [Figure 1]. It was measured with a thread and then transferred on scale. 18

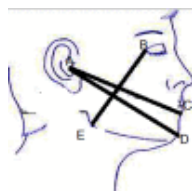


Figure 1: Facial swelling measurement by joining the 3 lines AC, AD and BE

Facial measurement was taken preoperatively and subsequently on 2nd, 5th and 7th days after surgery. The average data was calculated from the difference of postoperative and preoperative values.

Results

Total of 100 patients in the age group of 18 to 49 years with a mean age of 26.34 years were studied. The operating time was divided in four groups. The distribution of operative time and its effect on mouth opening, pain and swelling is shown in Table 2 and Table 3 respectively. There was increase in intensity of the pain with the increasing operative time on day 1 ($p = 0.000$). The difference between the operative times was statistically significant on day 2 and 5 but not significant on day 7 for trismus and swelling. There was an increase in size of swelling and more trismus with increasing operative time.

Table 2- Influence of Operative Time on Postoperative Swelling

Operative Time in Minutes	Visual Analogue Scale : VAS Score							
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
< 20	Mean	2.70	2.31	1.83	1.46	0.62	0.42	0.04
	N	25	25	25	25	25	25	25
	Std Deviation	0.68	0.60	0.66	0.70	0.69	0.57	0.18
21-25 min	Mean	3.5	2.7	1.6	1.2	0.56	0.34	0.08
	N	50	51	51	51	51	51	51
	Std Deviation	0.9	0.74	0.56	0.61	0.52	0.51	0.28
26 - 30 min	Mean	4.01	3.34	2.51	1.81	0.86	0.52	0.13
	N	52	50	50	50	50	50	50
	Std Deviation	0.82	0.80	0.71	0.8	0.67	0.59	0.33
30- 40 min	Mean	4.26	3.40	2.64	2.01	1.44	1.05	0.3
	N	21	19	19	19	19	19	19
	Std Deviation	0.75	0.68	0.44	0.4	0.20	0.18	0.11

Table 3- Effect Of Postoperative Time on Post Op Swelling and Trismus

Operative Time in Minutes	Swelling/MM				Mouth Opening/MM		
		Day 2	Day 5	Day 7	Day 2	Day 5	Day 7
< 20	Mean	6.30	2.16	0.15	28.5	35.4	40.2
	N	24	24	24	24	24	24
	Std Deviation	1.25	0.7	0.38	3.3	2.55	1.56
21-25 min	Mean	6.70	2.33	0.28	25.2	31.02	43.21
	N	50	50	50	50	50	50
	Std Deviation	1.07	0.75	0.44	3.61	3.75	1.60
26 - 30 min	Mean	7.36	2.87	0.34	23	29.2	41.2
	N	51	51	51	51	51	51
	Std Deviation	1.05	0.71	0.46	3.01	3.03	1.45
30- 40 min	Mean	7.6	2.05	0.50	20.7	30.35	40.2
	N	22	22	22	22	22	22
	Std Deviation	4.8	1.7	0.3	3.1	1.3	0.2

Discussion

The postoperative period of removal of impacted third molar is sometime associated with distresses to the patient due to pain, swelling and trismus, which affects his day to day activities. This study has shown that operative time definitely plays a role in the incidence of postoperative inflammatory tissue reaction. According to the various reviews, third molar surgery results in physical injury to the soft tissues, which initiate sequential release of mediators from mast cells and some other cells such as histamine, serotonin, bradykinin and prostaglandins, which participate in inflammatory process.¹⁶⁻²⁰

Postoperative swelling results from collection of protein rich inflammatory exudates and spasm of muscles fibres result in restricted mouth opening. Pain, Swelling and Trismus may be a result of the formation of such mediators of inflammation present after surgery in response to tissue injuries.

In our study, pain was assessed with VAS score. It is a sensitive method for recording pain. Berge TI et al had done a thorough investigation of visual analogues scale for assessment of pain and he came to the conclusion that pain, can be successfully assessed with VAS.

In our study it showed that increase in operative time was result in higher VAS score, more swelling and reduced mouth opening as per Table 2 and table 3. Greater depth and more angulation towards ramus region results in more bone removal, which might be responsible for increase in operative time and more soft tissue manipulation during procedure. This was one of the reasons that increase in operative time in our study was associated with more pain, swelling and trismus on the 2nd and the 5th day after surgery but on the 7th day most of the patients recovered completely. There was a gradual increase of inflammatory complications, when more time was associated with surgery, which resulted in more tissue injuries and stimulation of the release of mediators for inflammation. This was considered as one of the reasons for more pain, trismus and swelling.

The methodology used in our study was more specific to avoid the bias and improve the statistics as compared to some other previous studies.^{25,12} Results of our study suggested that post operative pain, swelling and trismus differed depending on the characteristics of the patient's age. Operating time was also a major factor but due to the clinical observational nature of the study and small sample size, they could be considered as limitations of the study.

Conclusion

In conclusion, inflammatory complications after third molar surgery still remain an important factor at the early postoperative periods. The outcome of the third molar operations such as pain, swelling and mouth opening depends on the characteristics such as depth of impaction and operative time.

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