ORIGINAL ARTICLE

To Compare the Triangular Flap to Envelop Flap for the Removal of Impacted Mandibular Last Molar

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ABSTRACT

Aim: To compare the post-operative complications of two surgical procedure, envelope flap and triangular flap, during the removal of impacted mandibular last molar.

Methods: This study was carried out in Oral & Maxillofacial Surgery Department, Sandeman (Provincial) Hospital Quetta during April 2013 to April 2014. A total number of 40 patients were included in this study. Patients were divided in to two groups A and B. the patients in group A was operated by using envelop flap while patients in group B was operated by using triangular flap. The complications like pain, swelling and limited mouth opening was recorded on 2nd, 5th and 7th post-operative data. The complications was compared between the two groups.

Results: There were 40 patients, 28 were males and 12 were females. Mean inter incisal opening was 45.4±4.5 mm preoperatively and 40.5±5.3mm on 7th post-operative days for the tri angular flap group. The difference between the two groups were not statically significant (P<0.05). There was significant difference between the two groups regarding the facial swelling on 2nd, 5th and 7th post- operative day. In triangular flap group VAS score were higher on 2nd and 5th post-operative day but not significantly higher on 7th post-operative day.

Conclusion: Postoperative complications of both groups shows that operative time and mouth opening was same for both groups but the swelling and pain were higher in triangular group as compared to the envelope flap group.

Key words: Impacted 3rd molar, Flap design, Dentoalveolar surgery

INTRODUCTION

Surgical removal of impacted mandibular 3rd molar is the most common oral surgical procedure which is associated with complications like pain; swelling and limited mouth opening.[1] Different surgical approaches are used for the removal of impacted mandibular third molar. The surgical procedure may be differing in flap design, bone removal, tooth sectioning and suturing. Minimizing the postoperative complication is the major concern for the surgeons.[2,3] The two most commonly used surgical procedures are envelop flap and triangular flap. Each of these surgical approaches has its own advantages, disadvantages and indications.[2,4] The incidence of complication depend upon the operative technique, age of the patients, general physical condition of the patient, experience of the operator, oral hygiene and compliance of the patient to postoperative instructions.[4,5] The surgical procedure is considered to be one of the factors affecting the severity of complication. There are different flap designs but triangular and envelope flaps are the two most commonly used procedure.[2,5] Several studies has been undertaken to compare these two flap design but only few of them compared the early postoperative morbidity associated with the flap design[6,7]. In the present study we have compare the effect of triangular and envelope flap design on the operative time, postoperative pain, limited mouth opening and swelling after the removal of impacted mandibular last molar.

PATIENTS AND METHODS

This prospective study was conducted on 40 patients in the Department of Oral and Maxillofacial Surgery, Sandeman (Provincial) Hospital Quetta from April 2013 to April 2014. The patients were between 20 to 32 years of age having unilateral impaction. Those patients having bilateral impactions were operated on one side only. All healthy patients with the age between 20 to 32 years coming to oral and maxillofacial surgery department for the removal of impacted mandibular 3rd molar, with Pell and Gregory class I, II position A and B were included in this study. Deeply impacted class III and position C and patients with systemic disease, patients with local pathology at the site of surgery and patients with compromised oral hygiene were excluded from the study. Orthopentomogram (OPG) was used as standard x-ray for the assessment and classification of impaction[10,11,12].

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Patients were randomly divided in to two groups A and B. Patients in group A was operated by using envelope,a sulcular incision starting from external oblique ridge of the mandibular ramus extended to the mesial aspect of the 2nd molar tooth, and those in group B was operated by using triangular flap, a sulcular incision having a buccal releasing incision at 45 degree angle on mesial aspect of 2nd molar. Before surgery written informed consent was taken from patients. Standard surgical protocol was adapted. All the patients were given a single dose of one gram of Augmentin orally one hour before surgery as prophylaxis for wound infection. Patients were operated by one surgeon. Surgical procedure performed under local anesthesia by using 2% lidocane with1:100, 0000 Epinephrine. Surgical site exposed and bone around tooth removed with round surgical bur while using normal saline as coolant so as to prevent thermal necrosis of bone. After the removal of tooth surgical site washed with saline and the wound closed by using single 3/0 silk suture over envelope flap and three sutures over triangular flap (one over horizontal incision and two over vertical releasing incision).

All patients were given post- operative instructions i.e. to keep pack over the wound for 30 minutes ,use of saline as mouth wash three time daily starting 24 hours after operation and to take analgesic, tab caflam (Diclofenic Potassium) 50mg, no antibiotics were prescribed. Patients were recalled for follow-up on 2nd, 5th and 7th post-operative days and the data regarding variables were recorded. Sutures were removed on 7th postoperative day. Operation time was recorded as time taken between the incision and placement of last suture. Pain was assessed by using a 10- cm horizontal visual analog scale (VAS), in which the end points indicated as no pain, Mouth opening /inter incisal distance (mm) by using faxable stainless steel measuring tap, and swelling by measuring distance between corner of mouth and tragus of ear (tr-c) by using soft plastic measuring tap.

RESULTS

There were 40 patients, 28 males and 12 females, out of these 10 patients (25%) having pell and Gergory class; I position A 3rd molar, 5 patients (7.5%) having class II position; B,16 patients (40%) having class; II position A and 9 patients (27.5 %) having class; II position B impacted 3rd molars (Table 1). Mean inter incisal opening was 45.4±4.5 mm preoperatively, it was recorded as 28.3±5 mm on 2nd, 33.6±4.5 on 5th and 42.5±3.5 on the 7th post-operative days for the envelope flap group and 25.5±6 mm on 2nd, 30.4±3.5 on 5th, and 40.5±5.3mm on 7th post-operative days for the tri angular flap group. The difference between the two groups were not statically significant [P<0.05] (Table 2). There was significant difference between the two groups regarding the facial swelling on 2nd, 5th and 7th post-operative day. The tragus commissure distance were lower in the envelop group as compare to the triangular group (Table 3). Post-operative pain was recorded for 7 days after surgery by using visual analog scale (VAS) where the one end was marked as no pain. Extraction was considered as painful (Table 4). In triangular flap group VAS score were higher on 2nd and 5th post-operative day but not significantly higher on 7th post-operative day (Table 5).

Table 1: Pell and Gregory classification of impacted mandibular 3rd molar

Impaction classification	No.	%
Class I position A	10	25.0
Class II position B	5	7.5.0
Class II position A	16	40.0
Class II position B	9	27.5

Table 2: Pre and post-operative mouth opening

Flap design	No	Preop	2nd postop day	5th postop day	7th postop day
Envelope	20	45.5±5	28.2±5	38.4±5	43.7±6
Triangular	20	45.5±5	24.6±6	29.6±6	40.5±5

P = <0.05 (Significant)

Table 3: Post-operative facial swelling

Tragus - commissure distance (Tr-C) [mm]	Envelope flap	Triangular Flap
Tr –c (2nd day)	120.5±5	123.5±5
Tr –c (5th day)	115.5±5	120.4±6
Tr—c(7th day)	112.0±3	115.3±5

P= <0.05 (Significant)

Table 4: Post-operative pains

Postop days	Envelope flap	Triangular flap
2nd	4.0±2	5.5±5
3rd	2.9± 4	4.0±6
7th	1.5 ±2	2.5±5

P= <0.05 (Significant)

Table 5: Operation time

Flap design	No.	Operation time (mints)
Envelope flap	20	20.5±5
Triangular flap	20	25.3±5

P= >0.05 (Not significant)

DISCUSSION

Surgical removal of impacted mandibular last molar is one of the most common oral surgical procedures which are associated with complication like pain, swelling and limited mouth opening. Operation time, type and class of impaction, pre-operative administration of steroids, and experience of surgeon and compliance of the patients to the post- operative instruction are the possible factors which affect the post-operative complications.[4,9,10] The envelope and

triangular flaps are commonly used surgical approaches for exposure of impacted mandibular 3rd molar.[2,3,5] Both of these two surgical approaches have its own advantages, disadvantages and indications but the choice depend upon the surgeons preference[2].Both flap design provide sufficient visualization and safety of vital structure. In the present study we have compared the severity of complications associated with these two surgical approaches[4,6,7,8].

The surgical procedure was under taken by single surgeon in the same clinical conditions by using standard surgical protocol. Both groups were given Same amount of analgesic post-operatively as to eliminate the patient's compliance factor so the flap design was the sole factor for the post-operative morbidity. The limited mouth opening after last molar surgery is due to inflammatory processes involving masticatory muscles secondary to the raising of mucoperiostal flap[2,6,9,10]. There was significant difference in the mouth opening in the two groups on 2nd, 5th post-operative day. Limited mouth opening was most obvious in triangular flap group but on 7th post-operative day, there was no difference in mouth opening in the two groups. Our study contradicts the study by kirk et al, in which there was no difference in the mouth opening on 2nd and 7th post -operative day.

There are different methods used for measurement of facial swelling i.e. CT scan, MRI, U/S and self-evaluation.[11,12,13] We determine facial swelling by measuring the distance between tragus of ear and corner of mouth. This method is not as effective as CT and MRI but it is cast effective. There was less facial swelling in envelope flap group. Our study was consistent with that of Kirk et al.[2] The post-operative pain were not statically significant, we evaluated the post-operative pain by using visual analog scale. Our study regarding pain is consistent with that of Kirk et al.[2] In our study the mean visual analog scale for triangular group was higher on 2nd, 5th post-operative day but no deference on 7thpost-operative day.

CONCLUSION

Postoperative complications of both the groups shows that operative time and mouth opening was same for both groups but the swelling and pain were higher in triangular group as compared to the envelope flap group. We recommended that the envelop flap should be preferred over triangular flap due to its less complication rates.

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