



EVALUATION OF COMMA-SHAPED INCISION AND ITS INFLUENCE ON POST-OPERATIVE COMPLICATIONS IN SURGICAL REMOVAL OF IMPACTED MANDIBULAR THIRD MOLARS

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ABSTRACT

Objective: This study was carried out to evaluate the Comma-shaped incision and its influence on post-operative complications in surgical removal of impacted mandibular third molars. **Subjects and methods:** This study was conducted on thirty patients undergoing extractions of impacted mandibular third molars from the outpatient Clinic of the Hospital of Faculty of Dental Medicine – Boys – Cairo, Al-Azhar University. Patients were 18 to 56 years 14 (males and 16 females) where they matched the sample's conditions which are: we exclude patients suffering from general diseases and Pregnant and lactating patient. An objective evaluation of the comma-shaped flap design will be carried out on the 1st, 3rd and 7th post-operative days. **Results:** The difference between patient recall time were statistically significant for pain, trismus, post-operative infection and wound dehiscence ($p < 0.05$) but not significant for swelling. **Conclusion:** Comma shaped incision appears to be a simpler, easier, and more effective technique for minimizing post-surgical morbidity. Post-operative pain and trismus are less in the comma shaped incision. The incision is superior in preventing Post-operative infections and Wound dehiscence.

KEYWORDS: Comma shaped flap incision, Wound dehiscence, Trismus, Post-operative infection.

INTRODUCTION

Third molars are not generally seen in approximately 25% of individuals. The condition of un-erupted mandibular third molars is prevalent, varies broadly and is affected by gender, age and ethnicity ⁽¹⁾. The eruption failure of an impacted lower third molar usually necessitates a routine surgical procedure to remove the impacted tooth. It has been reported that a significant portion of those on oral and maxillofacial surgery waiting lists are awaiting third molar removal ⁽²⁾.

Impacted mandibular third molar teeth are not usually a complication themselves. However, as the patient ages, they can stimulate varied complications which endanger the integrity of the health of the individual affected. These complications involve pain in affected side of the jaw (unilateral or bilateral), swelling, pericoronitis, damage to adjacent tooth, difficulty in mouth opening, cystic lesions, neoplasms and Tempro-mandibular joint disorders ⁽³⁾.

Patients don't usually seek dental treatment until complications arise, and signs and symptoms

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are clinically evident. Extraction of lower third molars is one of the most frequently carried out surgical procedures in oral and maxillofacial surgery^(4,5). Surgical removal of the impacted lower third molars is usually performed without intra- or post-operative complications. However, these routine procedures can result in several post-operative complications; including sensory nerve damage, dry socket, infections, hemorrhage and post-operative pain⁽⁶⁾. Notwithstanding, the risk of developing more serious complications such as severe trismus, iatrogenic damage to adjacent second molar, and iatrogenic mandibular fracture is not rare. Proper planning helps clinicians avoid most of these complications^(7,8).

This surgical procedure involves the manipulation of both hard and soft tissues. The flap design influences the visibility and accessibility to the impacted tooth and has an impact on subsequent healing process of the surgical defect created during the surgery, and hence is a critical parameter in the surgical removal of the impacted mandibular third molar^(9,10).

Comma-shaped flap incision is a newly-introduced flap design aiming at enhancing the healing potential of the surgical site. This comma-shaped flap incision starts from a point which is at the depth of stretched vestibular reflection, posterior to the distal aspect of the presenting second molar. The incision is made in an anterior direction, reaching a point below the second molar, from which it is smoothly curved up to meet the gingival crest at the disto-buccal line angle of the second molar. The incision is continued as a crevicular incision around the distal aspect of the second molar. After reflection of the flap, common steps of removal impacted third mandibular molars are followed⁽¹¹⁾.

SUBJECTS AND METHODS

This study was conducted on thirty patients with undergoing extractions of impacted mandibular third molars from the outpatient Clinic of the Hospital of Faculty of Dental Medicine, Boys, Cairo, Al-Azhar University.

Patient Selection

Selection of patients was based on specific inclusion and exclusion criteria as the following:

Inclusion Criteria:

Patients with class 1 and class 2, positions A or B mandibular third molar impaction as described in Pell and Gregory classification with good oral hygiene and medically free with no systemic complications. Male and female patients aged 18 to 56 years.

Exclusion Criteria:

Medically compromised patients that would jeopardize the bone healing process, pregnant and lactating patients.

Ethical Consideration:

This study was carried out after approval of ethical committee, Faculty of Dental Medicine, Al-Azhar University, Cairo, Boys. Ethical committee approval number 81/85.

Patient Consent:

Each patient was signed an informed consent having details about the whole surgical procedure before starting of the study. After getting informed consent from the patient, the treatment was done.

Preoperative Preparation:

Prior to surgery, a complete medical, dental and drug history as well as patient's data (name, gender and age) were collected. Then, panoramic views and periapical X ray films were taken for all patients to evaluate and classify the impacted third molars, amount of bone around it and relation to the second molars. Patients were advised to do full mouth scaling prior the day of surgery. Then, each patient was appointed for surgery.

Surgical procedures:

A standardized approach to the surgical extraction of the impacted lower third molars using buccal guttering technique as follows:

Inferior alveolar, lingual and long buccal nerve block injections using Articaine HCL 4% with Epinephrine (ADR) 1:100,000 for the local anesthesia.

A Comma-shaped incision was made using blade No 15, mounted on Bard Parker Scalpel handel No 3, and a full thickness mucoperiosteal flap was raised gently using a periosteal elevator. The incision started from a point which is at the depth of stretched vestibular reflection, posterior to the distal aspect of the presenting second molar. It was made in an anterior direction. This incision was extended to a point below the second molar, from which it is smoothly curved up to meet the gingival crest at the disto-buccal line angel of the second molar. The incision was continued as a crevicular incision around

the distal aspect of the second molar.

Bone was removed using surgical burs with straight hand piece with plenty of saline irrigation. Splitting technique was used to deliver the tooth from the socket when needed or whole tooth was extracted using straight elevator or lower molar forceps. The flap was repositioned and sutured using 3/0 sterile natural non-absorbable braided silk in interrupted pattern. Pressure packs were applied immediate post-operative. Post extraction instructions were handed and explained to the patient. Sutures were removed on the 7th post-operative day after confirming a complete wound healing (Figure 1).

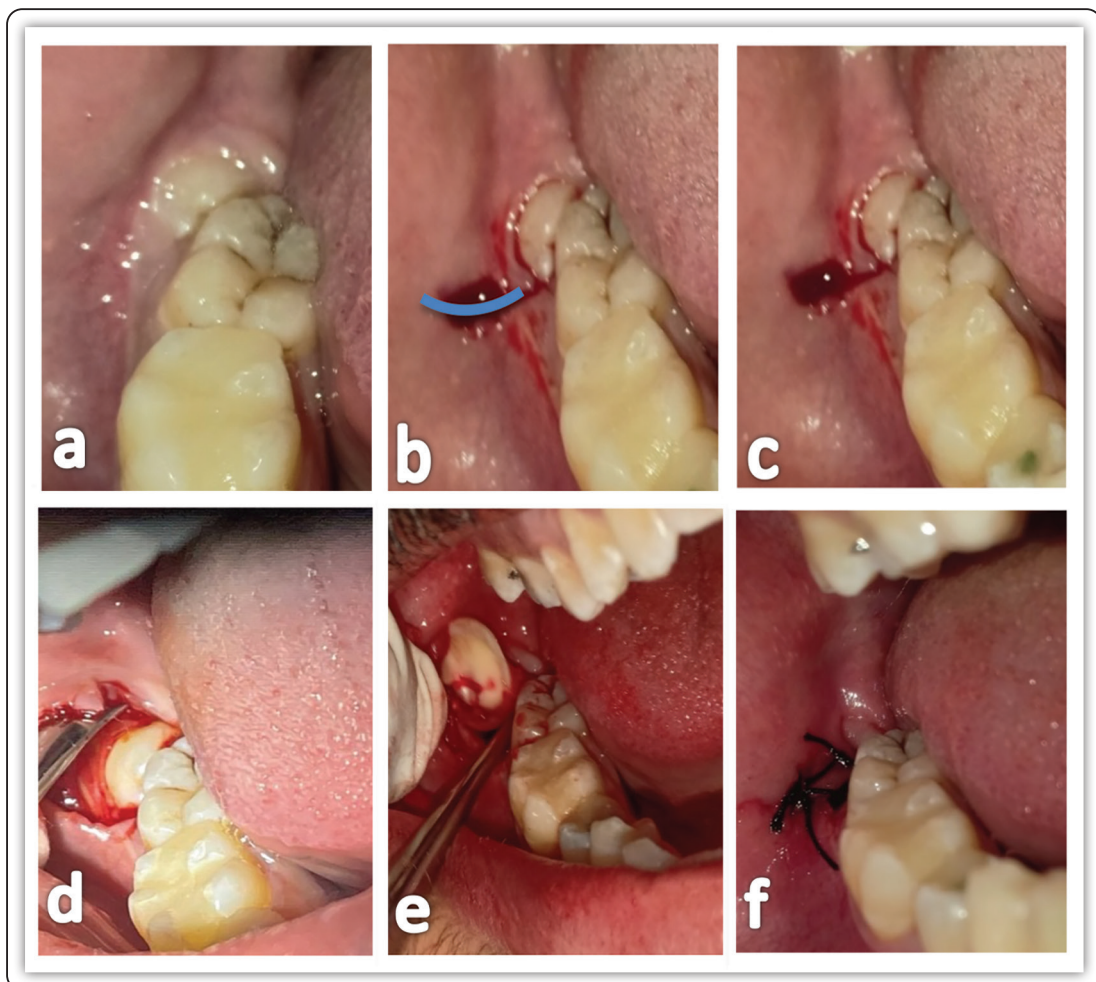


FIG (1) A photograph showing a. Pre-Operative impacted Mandibular third molar, b. Marked Comma shaped flap design, c. Comma flap incision, d. reflection of flap with periosteal elevator, e. tooth delivery from socket, f. suturing with 3/0 sterile natural non-absorbable braided silk

Postoperative Assessment:

The patients were given standard post-operative instructions and were told to apply ice pack on the region intermittently first day 5 minutes every 20 minutes and soft diet for the next Three days after surgery.

Postoperative evaluation:

An objective evaluation of the comma-shaped flap design will be carried out on the 1st, 3rd and 7th post-operative days and postoperative complications such as pain trismus, swelling, wound dehiscence and post-operative infection.

The values were tabulated and were subjected to statistical analysis

Evaluation of pain

All measurements of pain will be designated with a visual analogue scale (VAS) score. Pain magnitude is to be assessed by using a 0-10 scale that ran From Zero indicating 'no pain' to 10 which indicates 'worst pain'. Measurements will be scored by the patients themselves, and then averaged to get a final score of pain intensity.

Evaluation of swelling

The evaluation of the facial swelling will be performed using a horizontal and vertical guide with a flexible ruler to check swelling and width of face in two dimensions only ⁽¹²⁾. The reference lines are the edge of the tragus of the ear on the operated side to the corner of the mouth, and from the gonion to lateral canthus of eye of the operated side. The distance between the tragus and the corner of the mouth is added to the distance between the gonion and lateral canthus of eye over the maximum convexity of the soft tissues. The average of these measurements will be recorded in centimeters (cm). Percentage of swelling will be calculated as follows:

$$\frac{\text{Post-operative} - \text{pre-operative}}{\text{pre-operative}} \times 100.$$

Evaluation of Trismus

The maximum inter-incisal gap between the mandibular and maxillary incisors will be measured by a stainless steel scale in millimeters at the extreme convenient mouth opening. The incisal edges of maxillary and mandibular central incisors are going to be used as a reference for the repeated measurements. Percentage of the trismus will be calculated as follows:

$$\frac{\text{pre-operative} - \text{post operative}}{\text{pre-operative}} \times 100.$$

Statistical Analysis

Data were collected, tabulated, and statistically analyzed using Grap Pad Instant (Graph Pad, Inc, USA) software for windows. A value of $P < 0.05$ was considered statically significant. For parametric (numerical) Data one-way ANOVA was done for comparison followed by Tukey's pairwise if showed significant results. For non-parametric (categorical) data Kruskal-Wallis and chi-square tests were done for comparison.

RESULTS

The difference between patient recall time were statistically significant for pain, trismus, post-operative infection and wound dehiscence ($p < 0.05$) but not significant for swelling. ($p > 0.05$) as shown in following tables.

Pain VAS

Descriptive statistics of pain (VAS) showing mean, standard deviation (SD), minimum, maximum and 95% confidence intervals (low and high) values as function of patient recall time are summarized in table (1).

Swelling size

Descriptive statistics of swelling size (cm) showing mean, standard deviation (SD), minimum, maximum and 95% confidence intervals (low and high) values as function of patient recall time are summarized in table (2,3).

Mouth opening

Descriptive statistics of mouth opening (cm) showing mean, standard deviation (SD), minimum,

maximum and 95% confidence intervals (low and high) values as function of patient recall time are summarized in table (4).

TABLE (1) Comparison of pain VAS results (Mean values ± SDs) as function of patient recall time

Variables	Mean	± SD Min.	Range		95% CI		Statistics	
			Max.	Low	High	P value		
<i>1st day</i>	4	1.6	1	10	3.6	5.2		
<i>Recall time</i>	<i>3rd day</i>	5	1.2	2	7	3.9	5.2	<0.0001*
	<i>7th day</i>	2	0.75	1	3	1.4	2.1	

*Different letters indicating statistically significant (Turkey p<0.05) *; significant (p<0.05) ns; non-significant (p>0.05)*

TABLE (2) Comparison of swelling size (Tragus- mouth) results (Mean values ± SDs) as function of patient recall time

Variables	Mean	± SD Min.	Range		95% CI		Change %	
			Max.	Low	High			
<i>Pre</i>	10.88 ^A	0.645	10	13	10.541	11.219	-----	
<i>Recall time</i>	<i>1st day</i>	10.88 ^A	0.6448	10	13	10.541	11.219	0%
	<i>3rd day</i>	11.2 ^A	0.704	10	13.2	10.845	11.555	2.94%
	<i>7th day</i>	10.9 ^A	0.632	10	13	10.563	11.237	0.18%
<i>Statistics</i>	<i>P value</i>			0.1684 ns				

*Different letters indicating statistically significant (Turkey p<0.05) *; significant (p<0.05) ns; non-significant (p>0.05)*

TABLE (3) Comparison of swelling size (eye-gonion) results (Mean values ± SDs) as function of patient recall time

Variables	Mean	± SD Min.	Range		95% CI		Change %	
			Max.	Low	High			
<i>Pre</i>	8.708	0.728	7.5	11	8.41	9.01	-----	
<i>Recall time</i>	<i>1st day</i>	8.688	0.708	7.5	11	8.39	8.98	0.23%
	<i>3rd day</i>	8.908	0.768	7.5	12	8.59	9.23	2.29%
	<i>7th day</i>	8.708	0.728	7.5	11	8.41	9.01	0%
<i>Statistics</i>	<i>P value</i>			0.6159 ns				

*Different letters indicating statistically significant (Turkey p<0.05) *; significant (p<0.05) ns; non-significant (p>0.05)*

TABLE (4) Comparison of mouth opening results (Mean values \pm SDs) as function of patient recall time

Variables	Mean	\pm SD	Range		95% CI		Change %	
			Min.	Max.	Low	High		
Recall time	Pre	3.592 ^A	0.432	2.4	4.5	3.372	3.812	-----
	1 st day	2.788 ^B	0.524	2	3.5	2.543	3.033	22.38%
	3 rd day	3.316 ^A	0.423	2.2	4	3.106	3.526	7.68%
	7 th day	3.504 ^A	0.396	2.3	4	3.293	3.715	2.45%
Statistics	P value	<0.0001*						

*Different letters indicating statistically significant (Turkey $p < 0.05$) *; significant ($p < 0.05$) ns; non-significant ($p > 0.05$)*

DISCUSSION

This study was conducted on 30 patients need extraction of impacted mandibular third molar. All Patients in current study were selected according to inclusion and exclusion criteria and collected in one group for evaluation a 16:14 female to male ratio with a female predilection to have lower third molar surgery. This female predilection is reported in another study to be due to differences between the growth in males and females. Male jaws continue to develop during the period of eruption of third molars, therefore, creating more space for third molar ⁽¹³⁾.

The pre and post-operative pain checked by the visual analogue scale (VAS) as this scale can be easily interpreted by a patient simply. According to pain assessment It was found that the highest recorded mean value (5 VAS) 3rd day postoperatively followed by 1st day postoperative mean value (4 VAS) while 7th day postoperative recorded the lowest mean value (2 VAS).

There was a statically significant difference in pain scores with comma flap incision.

On the contrary to other study which found no clear statically differences in pain and post-operative patient morbidity between the different flap designs after third molar surgery. ⁽¹⁴⁾

In the present study the results showed that some patients complained of pain and trismus few days postoperatively after the surgical procedure and had no clinical significance on either pain scores or trismus. These findings are in concurrence with study done by Neelkandan et al and Nageshwar ⁽¹⁵⁾, they compared between ward's incision and comma shaped incision regarding pain and trismus. It was found a statistically significant difference between the two flap designs ($P < 0.05$) at immediate, 1st day, and 3rd day postoperatively. Thus, the levels of trismus and pain were higher in the Ward's incision group as compared to the comma incision group. This could be because of the preservation of the critical anatomic structures in the third molar region due to its unique design.

All patients showed absence of infection postoperatively with 100% absence of infection. This may be due to that Primary healing of the extraction sites was associated with general factors (the age of patients, smoking habit, and systemic diseases, such as liver and kidney disease, diabetes and anemia, partial factors (flap design and boneless range) ⁽¹⁶⁾. Both factors were promoted in current study due to exclusion criteria and nature of lingually based comma shaped flap incision.

It was also found that there was statistically significant difference on comparing between presence of wound dehiscence ($p < 0.05$) with 97%

absence of wound dehiscence. From all patients only one patient showed presence of wound dehiscence postoperatively.

This is in agreement with Yuan et al. (16) who found comparing with buccal-based flaps; lingual-based flaps are superior in preventing postoperative early wound dehiscence in mandibular impacted third molar extraction. As a desirable distolingual-based flap, the comma flap could be regarded as an alternative considering its potential to reduce postoperative discomfort, especially for mid-bony or intermediary bony impactions.

There is some Limitation of the study the sample size, age of the patient, duration of the study and depth of impaction. Further research is recommended for removal of impacted mandibular third molars with comma-shaped flap incisions for a larger sample size, Different depth of impaction and Different age of patients.

CONCLUSION

Comma-shaped incision appears to be a simpler, easier, and more effective technique for minimizing the post-surgical morbidity. Post-operative pain and trismus are less in the comma shaped incision. The incision is superior in preventing Post-operative infections and Wound dehiscence.

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