



## FLAP DESIGN: COMPARISON OF WARD'S FLAP VERSUS MODIFIED WARD'S FLAP IN SURGICAL EXTRACTION OF IMPACTED MANDIBULAR THIRD MOLAR.

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**ABSTRACT...** To compare the Ward's Flap Versus Modified Ward's flap in relation to access, healing & postoperative complications in surgical extraction of mandibular third molar impaction. **Study Design:** Comparative Cross Sectional. **Setting:** Department of Oral & Maxillofacial Surgery LUMHS Jamshoro/Hyderabad: **Period:** March 2017 to November 2017. **Materials and Methods:** The history, clinical examination and radiographs (OPG and periapical) had done by team of researchers and recorded on proforma. After selection of patient into either group (Group A=Wards Flap, Group B Modified Wards), the surgical extraction was carried out under local anesthesia. For group A, a standard full thickness mucoperiosteal flap (ward's flap) was raised. The incision was given mesial to the impacted lower third molar. For group B, a standard full thickness mucoperiosteal flap (Modified ward's flap) was given mesial to second molar. At the end of the surgery, the flap design used for the extraction of impacted lower third molar tooth and the duration of each operation (from the first extraction maneuver to the completion of the last suture), Pain, Swelling and Trismus<sup>13</sup> were recorded on the proforma. Every patient was called for follow up on the 3<sup>rd</sup> day and 7<sup>th</sup> day. **Results:** Mean age was found 27.93 years, with range of minimum 20 years and maximum 35 years. Male were found in the majority 72.3%. Majority of the cases 51.5% were found with class B, in class A 37.5% and 10.9% were found with class C. According to the impaction position 50% cases were in class I, and 50% cases were in class II. Preoperative pain measurement was done according VAS, 71.9% patients were found with mild pain, 9.4% were with moderate pain while 18.8% patients were without pain. Modified Wards flap showed good efficacy regarding duration of third molar extraction as compare to Ward's flap P-value 0.018. Modified ward's flap had showed less postoperative pain as compare to ward's flap p-value 0.022. No significant difference was found between both groups on 3<sup>rd</sup> and 7<sup>th</sup> postoperative day in Mouth opening. **Conclusion:** This study concluded that both ward's flap and modified ward's flaps showed good efficacy, while duration of surgery and postoperative pain were significantly less in the modified ward's flaps as compare to ward's flap. More large sample size studies are required to evaluate more accurate findings.

**Key words:** Flap, Mouth Opening, Pain, Surgical Extraction, Third Molar

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### INTRODUCTION

Lower third molar extraction is the frequently performed practice in oral surgery and necessitates substantial preparation and ability in analysis and intraoperative as well as postoperative management.<sup>1</sup> The extraction may range from relatively easy to extremely difficult depending on its location, depth, angulation, and density of bone. Regardless of degree of difficulty, the success depend primarily on correct preoperative assessment and planning, and on careful execution that comes with extensive

training and experience.<sup>2</sup>

Although the prevalence of complications in relation to surgical procedure is low, surgeon must previously inform the patient for possible intraoperative and postoperative risks and complications.<sup>3</sup>

Flap design is one of the most important factor which influence the severity of the complications, allowing for optimal visibility and access to impacted tooth.<sup>4</sup> Flaps used preferably for third

molar surgery are envelop flap and triangular flap.<sup>4</sup> Modified Ward's flap is regarded as more conservative owing to adequate degree of tissue reflection, which has advantages like better accessibility and visibility especially in deep seated mandibular impactions.<sup>5</sup>

The third molar surgery in some case may be carried out simply by closed extraction method, and many cases involve open surgical procedures that comprise the raising of flap and removal of alveolar bone.<sup>6</sup> The benefit of third molar surgery include the relief of pain, swelling, trismus, the prevention of caries, periodontal disease, prevention of pathological conditions such as abscess, cyst and pathological fracture.<sup>7</sup> Several classification system have been established to estimate the surgical difficulty of removing lower third molar.<sup>8</sup>

The difficulty index consist of three components; Angulation (in relation to long axis of second molar [mesioangular, distoangular, horizontal], Depth (in relation to occlusal plane [Class A,B,C]) and position (in relation to vertical ascending ramus [Class I,II & III]).<sup>9</sup> The occurrence of these indices are associated with several factors which include age, gender, and general health of patient, the smoking status, use of oral contraceptive (in case of females), and surgical technique used along with the preferred flap design.<sup>10</sup>

The aim of this study is to evaluate the less aggressive technique Ward's versus Modified Ward's flap with respect to less post-operative complications in removal of lower third molar.

#### **DATA COLLECTION PROCEDURE**

An informed and written consent was taken before enrolment of study. The demographic and clinical parameters like age, gender, medical history, procedure of removal of tooth were identified and recorded in proforma.

The history, clinical examination and radiographs (OPG and periapical) had done by team of researchers and recorded on proforma. Preoperative assessment of pain [using VAS from zero (no pain) to 10 (worst pain imaginable)],

degree of swelling [using criteria published by Amin & Laskin] and limited mouth opening [using millimeter ruler (measuring the maximum distance between maxillary and mandibular central incisor)] associated with impacted mandibular third molar was performed.<sup>11</sup>

A Port in which two types of slips (slip A= Ward's flap; Slip B=Modified ward's flap) were present and every patient was allowed to take only one slip so that we plan for that particular type of mucoperiosteal flap.

After selection of patient into either groups, the standard preparation and draping was done and all surgeries were performed under supervision of senior surgeon experience more than 5 years, under local anesthesia by Conventional nerve block anesthesia of inferior alveolar nerve, lingual nerve and buccal nerve with two 1.8mL cartridges of 2% xylocaine with epinephrine 1:100,000 (Medicaine; made in Korea) was given.

For group A, a standard full thickness mucoperiosteal flap (ward's flap) was raised by using sterile carbon steel surgical blade #15 (Feather safety razor co. Ltd Japan). The incision was given mesial to the impacted lower third molar.

And for group B, a standard full thickness mucoperiosteal flap (Modified ward's flap) was given by incision mesial to second molar.

Using the straight elevator tooth was lifted; if tooth is retrieved, procedure was stop otherwise bone was removed with rosehead round bur in slow speed turbine form mesio-buccal and disto-buccal side with constant irrigation of 0.9% normal saline (Searle Ltd. Pakistan) then couplain straight elevator was used to lift the tooth after that any sharp bone was smoothen with curved bone filer then wound was closed with 3-0 Vicryl suture (Johnson & Johnson; made in USA). Sterile folded gauze (2 x 2) was applied over the surgical wound to achieve compression and hemostasis for 30 minutes.

Standard antibiotics (Amoxi-clav 625mg BD)

and painkillers (Ibuprofen 400mg TDS) were prescribed for 5 days.

At the end of the surgery, the flap design applied for the extraction of impacted lower third molar tooth and the duration of each operation (from the first extraction maneuver to the completion of the last suture), Pain, Swelling and Trismus<sup>13</sup> were recorded on the proforma.

Every patient was called for follow up on the 3<sup>rd</sup> day and 7<sup>th</sup> day.

**RESULTS**

In this study mean age was found 27.93 years, with range of minimum 20 years and maximum 35 years. Table-I

Age (n=64)	
Age (mean)	27.93 years
Standard deviation	3.93years
Minimum	20 years
Maximum	35 years

**Table-I. Distribution of cases according to age (n=64)**

Male were found in the majority 72.3% as compare to females 26.2%. Table-II

Gender	Frequency	Percent
Male	47	72.3%
Female	17	26.2%

**Table-II. Distribution of cases according to gender (n=64)**

Preoperative pain measurement was done according VAS, 71.9% patients were found with mild pain, 9.4% were with moderate pain while 18.8% patients were without pain. Table-III

VAS Scale	Frequency	Percent
No	12	18.8%
Mild	46	71.9%
Moderate	6	9.4%

**Table-III. Distribution of cases according to pain (According to VAS scale) (n=64)**

Modified wards flap shows good efficacy regarding duration of third molar extraction as compare to Wards flap P-value 0.018. Results

shows in Table-IV.

Pre-operative Assessment	Flap Design		P-Value
	A-Ward's Flap	B-Modified Ward's Flap	
<10 minutes	13	15	0.018
<20 minutes	12	17	
<30 minutes	7	0	

**Table-IV. Flaps comparison according to duration of third molar extraction (n=64)**

Modified ward's flap had showed less postoperative pain as compare to ward's flap p-value 0.022, as well as no pain was found in 14 patients in modified ward's flap group and 6 patients noted without pain in ward's flap group, while moderate pain found in 4 patients in ward's flap group, while no moderate pain was found in modified ward's flap group. Table-V.

Post-operative Pain	Flap Design		P-Value
	A-Ward's Flap	B-Modified Ward's Flap	
No pain	6	14	0.022
Mild pain	22	18	
Moderate pain	4	0	

**Table-V. Post-operative pain according to Ward's flap versus modified ward's flap (n=64)**

No significant difference was found between both groups on 3<sup>rd</sup> postoperative day; according to Tragus to corner mouth, Lateral canthus to angle of mandible, Tragus to menton and Mouth opening. Results shows in Table-VI.

Flap Design	Mean	SD	P-Value
<b>Tragus to Corner Mouth</b>			
A-Ward's Flap	12.3563	1.14101	0.427
B-Modified Ward's Flap	12.1688	0.67463	
<b>Lateral Canthus to Angle of Mandible</b>			
A-Ward's Flap	11.9938	1.73743	0.677
B-Modified Ward's Flap	11.8188	1.60170	
<b>Tragus to Menton</b>			
A-Ward's Flap	14.7281	1.84535	0.240
B-Modified Ward's Flap	14.1938	1.75774	
<b>Mouth Opening</b>			
A-Ward's Flap	43.6875	2.20611	0.382
B-Modified Ward's Flap	43.2812	1.39664	

**Table-VI. Comparison of flap according to swelling and mouth opening after 3<sup>rd</sup> postoperative day (n=64)**

No significant difference was noted in both groups on 7<sup>th</sup> postoperative day; according to Tragus to corner mouth, Lateral canthus to angle of mandible, Tragus to menton and Mouth opening. Results shows in Table-VII.

Flap Design	Mean	SD	P-value
<b>Tragus to Corner Mouth</b>			
A-Ward's Flap	12.0526	.62126	.462
B-Modified Ward's Flap	11.8864	.78576	
<b>Lateral Canthus to Angle of mandible</b>			
A-Ward's Flap	12.2632	1.40800	.026
B-Modified WARD'S flap	11.3182	1.21052	
<b>Tragus to Menton</b>			
A-Ward's Flap	13.9211	1.96683	.732
B-Modified Ward's Flap	13.7273	1.63100	
A-Ward's flap	44.9474	1.17727	.366
B-Modified ward's flap	44.5909	1.29685	

**Table-VII. Comparison of flap according to swelling and mouth opening after 7<sup>th</sup> postoperative day (n=64)**

## DISCUSSION

Ward's and modified ward's incision are regularly used and it was observed that these incision offer tremendous visual access and can be sealed by means of a suture introduced between the buccal and lingual soft tissues alone.<sup>11,12</sup> Likewise in this study we had compared Ward's and modified ward's flaps and we found good efficacy and less operative time in the modified ward's group as compare to ward's group. On the contrast to our study Desai A et al<sup>12</sup> reported that Koener's envelope flap was found to be better in terms of post-operative healing in Ward's incision.

In this study mean age was found 27.93 years, with range of minimum 20 years and maximum 35 years. Koyuncu BÖ et al<sup>13</sup> reported that patients were between 18 and 40 years old, with the average age being 23.30 years. There were 29 female and 7 male patients. While we found male were found in the majority 72.3% as compare to females 26.2%.

Preoperative pain measurement was done according VAS, 71.9% patients were found with mild pain, 9.4% were with moderate pain while 18.8% patients were without pain. Kumar S et al<sup>14</sup> informed that the effects displayed less hurt

totals on comma incision side as paralleled to ward's incision side. Comparable results were found in the study of Nageshwar. Our results are not in correspondence with the outcomes of Gool et al as they have perceived that harshness in discomfort is not linked to the sort of incision.<sup>15</sup> Modified ward's flap shows good efficacy regarding duration of third molar extraction as compare to Ward's flap P-value 0.018.

In our study modified ward's flap had showed less postoperative pain as compare to ward's flap p-value 0.022, as well as no pain was found in 14 patients in modified ward's flap group and 6 patients noted without pain in wards flap group, while moderate pain found in 4 patients in wards flap group, while no moderate pain was found in modified wards flap group.

Postoperative swelling is the consequence of trauma and infection. In this study no significant difference was found between both groups on 3<sup>rd</sup> postoperative day; according to Tragus to corner mouth, Lateral canthus to angle of mandible, Tragus to menton and Mouth opening. In a previous study of Forsgren H et al<sup>16</sup> stated that swelling is most marked after 19 to 24 hours, and then lessens later about 7 days.

No significant difference was noted in both groups on 7<sup>th</sup> postoperative day; according to Tragus to corner mouth, Lateral canthus to angle of mandible, Tragus to menton and Mouth opening. As well as Kumar S et al<sup>14</sup> reported that massive swelling was not encountered in both groups on 7<sup>th</sup> day, but 40% of the patients suffered enough pain in ward's incision assembly whereas only 13.33% had mild distension in modified ward's group.

## CONCLUSION

This study concluded that both Ward's flap and Modified Ward's flap showed good efficacy, while duration of surgery and postoperative pain were significantly less in the Modified Ward's flaps as compared to Ward's flap. Larger sample size studies are required to evaluate more accurate findings.

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## AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Ashook Kumar	Principal investigator, data collection.	
2	Anny Memon	Basic idea, Data collection.	
3	Suneel Kumar Panjabi	Methodology, References.	
4	Salman Shams	Resultls, Analysis	