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## INTRODUCTION

An impacted tooth was characterized by Mead in 1954 as “a tooth that is kept back from erupting into site as a result of malposition, absence of room, or different hindrances”.<sup>1</sup> Peterson later characterized impacted teeth as tooth that neglects to eject into the arch in the normal time.<sup>2</sup> Agarwal characterized affected tooth as a ‘tooth which is kept from eruption on account of anatomical boundary in the eruption pathway.’<sup>3</sup> Frequently impaction has been accounted for the mandibular and maxillary third molar, trailed by maxillary canines and the mandibular pre-molars.<sup>4</sup> Without a doubt, the third molars are frequently faced by impaction; this might be because of their

## EVALUATION OF SEVERITY OF PAIN AFTER REMOVAL OF IMPACTED THIRD MOLAR BY COMPARING TWO FLAP DESIGNS.

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**ABSTRACT... Objectives:** To evaluate the severity of post-operative pain after surgical extraction of impacted mandibular third molar using two different techniques i.e. comma incision and standard Wards incision. **Study Design:** Interventional study. **Setting:** Department of Oral surgery, Isra Dental College Hospital. **Period:** From January 2016 to June 2016. **Material & Methods:** A sample of 50 patients of impacted third molar was selected by non-probability purposive sampling for tooth extraction either by conventional technique or by coma shaped incision. Post-operative amount of pain was measured on 1<sup>st</sup>, 3<sup>rd</sup> and 7<sup>th</sup> day respectively. **Results:** Mean  $\pm$  SD age in group A and B was noted as  $28.5 \pm 4.32$  and  $27.2 \pm 4.39$  years respectively. Male and female in groups A and B were noted as 16 (64%) and 9 (36%), & 14 (56%) and 11 (44%) respectively. Right and left lower mandibular teeth extraction in groups A and B were noted 11 and 14, & 10 and 15 respectively. Pain was measured after extraction at day 1, day 3 and day 7. **Conclusion:** The Coma incision was preferable over the conventional method- the standard Ward`s incision because of lesser degree of post-operative pain.

**Key words:** Coma Incision, Extraction, Impacted Third Mandibular Molar, Standard Ward`s Incision, Pain.

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anatomical tight space as they are the last to eject when the space is previously involved by other teeth.<sup>4,5</sup> Coincidence of impaction of mandibular molars is more compared with maxillary molars.<sup>4</sup>

Range of period of impaction of third mandibular molar fluctuates in the middle of 17 – 50 years of age; nevertheless, the maximum everyday impaction is well-known in the 3<sup>rd</sup> decade.<sup>6</sup> Third molar typically erupts throughout the ages of 17-21 years of postnatal life.<sup>7</sup> However, the time of eruption of third molar is subjected to variations with different race.<sup>7-10</sup> In contrast, third mandibular erupts at the age of 26 years in European adults.<sup>8</sup> Eruption of third mandibular molar also varies

with gender, as it erupts 3-6 months earlier in male compared to female counterparts but previous studies had reported higher frequency of impaction of mandibular third molar in females compared to males.<sup>11-13</sup> Some researchers did not agree and reported that impacted mandibular third molars occur equally in both genders.<sup>10,12,14</sup>

Winter suggested a method based upon angulation of third molar where evaluated with the long axis of second molar and categorized as Mesioangular, Distoangular, Horizontal and Vertical angulation.<sup>5</sup> Mesioangular impaction of third mandibular molar is the most frequent subtype which is reported in 35% to 49% of people.<sup>6,15</sup> The continuous change and eruption in anatomical position of third mandibular molar similarly differs through intensity, environmental factors and nature of diet of the masticatory muscles.<sup>16</sup>

An impacted tooth is usually locked by the soft tissue, bone, anatomical space and position of adjacent tooth, aberrant tooth bud position, aberrant path of eruption, teeth or jaw size discrepancy or due to some pathological lesion.<sup>5</sup>

Impacted mandibular third molar are frequently associated with serious complication side effects as pain, inflammation, trismus, bleeding, bone fractures, etc.<sup>17</sup>

Impacted third molar mandibular may be associated with more serious complications such as cystic lesions, pericoronitis, neoplasm, root resorption, etc.<sup>6</sup> Many of the impacted third mandibular molar usually remain asymptomatic for many years, may be for whole life, but for the primary prevention of related complications is indicated.<sup>10,18</sup>

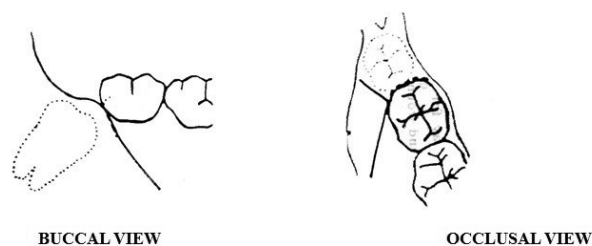
As part of surgical procedures, various types of conventional flaps are used in clinical practice but these are usually associated post-operative complications such as pain, hematomas, swelling, trismus, etc..<sup>19</sup>

Surgical removal of third mandibular molar is very common surgical procedure.<sup>1</sup>

Typical designing of flap helps avoiding tendon injury of temporalis which was frequently encountered in traditional incisions leading to complication of trismus.<sup>20</sup>

Comma incision is claimed of having lesser incidence of pain and swelling.<sup>19</sup> Since then utility of comma incision has never been studied thoroughly and credibility of the flap in minimizing postoperative complications along with adequate surgical access need to be determined.<sup>19</sup>

In standard ward incision (Figure-1), anterior incision curves forward from the distobuccal corner of the crown of the lower second molar and it ends alongside the mesiobuccal cusp of that tooth. Incision is then extended distally level with the buccal side of the tooth to the external oblique ridge. If the anterior part of the flap is elevated from the bone, one blade of a pair of scissors may be inserted onto the surfaces of the bone and the incision may be completed by closing the blades. Posterior part of the incision must slope outwards as well as backwards, as the ascending ramus lies on the lateral side of the body of the mandible.<sup>4</sup>



**Figure-1. Standard ward incision**

In comma incision (Figure-2), starting from a point which is at the depth of stretched vestibular reflection which is posterior to the distal aspect of the preceding second molar, the incision is made in an anterior direction. Incision is made to a point below the second molar, from where it is smoothly curved up to meet the gingival crest at the distobuccal line angle of the second molar. The incision is continued as a crevicular incision around the distal aspect of the second molar (a distolingually based flap).<sup>4</sup>

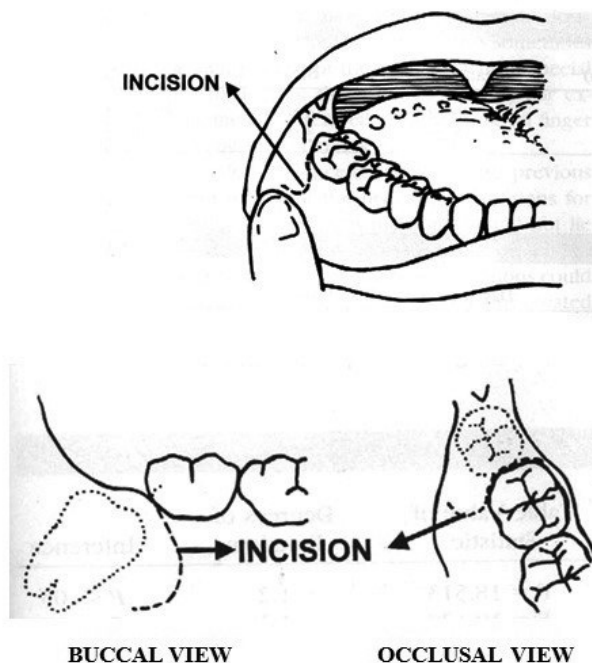


Figure-2. Comma incision

The purpose of this study is to compare comma incision with standard ward incision, as far as complication are concerned following removal of mandibular third molar.<sup>19</sup>

Hence, the objectives of the study were to assess the post-operative pain in surgical removal of impacted mandibular third molar using comma incision and standard Wards incision.

## MATERIAL AND METHODS

Our study is an interventional study of the general population  $N = 50$ . Patients visiting the Dental OPD of Isra dental college, Isra University from January to June 2016 were recruited. Patients coming to the OPD of Isra Dental College are generally both from rural and urban areas as Hyderabad is a small city and adjoining cities don't have tertiary based hospitals in their localities. Patients with impacted mandibular third molars of both genders were included into this non-probability purposive sampling study. Patients with ages 20 – 35 years were included. Patients having restricted mouth opening, systemic disorders, severe pericoronitis and pregnant patients were excluded from this study along with patients having disto-angular,

horizontal and vertical impactions. The purpose was to assess pain in surgical removal of impacted mandibular third molar using comma incision and standard Wards incision. The patients were categorized into two groups i.e. standard ward incision and comma incision. Pain was then recorded by visual analogue scale by asking the patient to the pain in score (0 to 10). Post-operative measurement of pain was measured on 1<sup>st</sup>, 3<sup>rd</sup> and 7<sup>th</sup> day respectively. SPSS version 22 was used to analyze the data. Prior to the study, the ethical approval for this study was obtained from the ethical review board of the institute and written consent form was obtained from the patient

## RESULTS

The present study was conducted at the Department of Dentistry, Isra Dental College. The study was conducted to compare the standard Ward's (Group A,  $n=25$ ) and comma incision (Group B,  $n=25$ ) for the assessment of pain after extraction of impacted mandibular third molar tooth.

Mean  $\pm$  SD age in group A and B was noted as  $28.5 \pm 4.32$  and  $27.2 \pm 4.39$  years respectively ( $t$ -value 1.07 and  $p = 0.26$ ). Insignificant  $p$ -value shows the study subjects in the 2 groups were age matched. Age distribution is shown in Table-I. Male and female in groups A and B were noted as 16 (64%) and 9 (36%), & 14 (56%) and 11 (44%) respectively ( $X^2 = 0.33$  and  $p = 0.56$ ) as shown in Table-II. Right and left lower mandibular teeth extraction in groups A and B were noted 11 and 14, & 10 and 15 respectively ( $X^2 = 0.82$  and  $p = 0.74$ ). Right and left lower mandibular tooth extraction is shown in Table-III.

Frequency of pre-operative pain as no pain, mild, moderate and severe pain were noted in group A as 17, 5, 3 and 0 and in group B 18, 4, 3 and 0 respectively (Chi-value 0.001 and  $p = 0.99$ ).

Frequency of post-operative pain on Day 1 as mild, moderate and severe categories in groups A and B were noted as 5, 7 and 13 & 4, 14 and 7 respectively (Chi-value 4.24 and  $p = 0.1198$ ). Frequency of severe post-operative pain on

Day 1 was 13 in groups A and 7 in group B, the differences were statistically not significant. Table-IV shows the frequency of post-operative pain on Day 1.

Frequency of post-operative pain on Day 3 as mild, moderate and severe categories in groups A and B were noted as 9, 10 and 6 & 22, 3 and 0 respectively (Chi- value 11.56 and p= 0.0091). Frequency of severe post-operative pain on Day 3 was identified as 6 in group A and 0 in group B, the difference was highly significant. Table-IV

shows the frequency of post-operative pain on Day 3.

Frequency of post-operative pain on Day 7 as pain in no, mild, moderate and severe categories in groups A were noted as 3, 8, 11 and 2, while in group B pain seen as no, mild, moderate and severe were 7, 22, 3 and 0 respectively (Chi- value 15.22 and p= 0.0005). Frequency of severe post-operative pain on Day 7 identified as 2 in group A and 0 in groups B, the difference was highly significant as shown in Table IV.

	Mean	SD	Range	t-value	P-Value
Group A. Standard Ward`s incision (n=25)	28.56	4.32	21-35	1.07	0.28
Group B. Coma incision (n=25)	27.24	4.39	20- 34		

**Table-I. Age distribution of study population (n=50)**

	Male	Female	X <sup>2</sup>	P-Value
Group A. Standard Ward`s incision	16 (64%)	9 (36%)	0.33	0.56
Group B. Coma incision	14 (56%)	11 (44%)		

**Table-II. Gender distribution of study population (n=50)**

	Right lower Mandibular	Left lower Mandibular	X <sup>2</sup>	P-Value
Group A. Standard Ward`s incision (n=25)	11	14	0.82	0.74
Group B. Coma incision (n=25)	10	15		

**Table-III. Frequency of tooth extraction in study population (n=50)**

N = 50		Pain				X <sup>2</sup>	P-Value
		No	Mild	Moderate	Severe		
Pre-Operative	Group A: Standard Ward Incision	17	5	3	0	.001	0.99
	Group B: Comma Incision	18	4	3	0		
Day 1	Group A: Standard Ward Incision	0	5	7	13	4.24	0.119
	Group B: Comma Incision	0	4	14	7		
Day 3	Group A: Standard Ward Incision	0	9	10	6	11.56	.009
	Group B: Comma Incision	0	22	3	0		
Day 7	Group A: Standard Ward Incision	3	8	11	2	15.22	.005
	Group B: Comma Incision	7	22	3	0		

**Table-IV. Assessment of severity of pain in study population (n=50)**

## DISCUSSION

Tooth impaction is defined as defective eruption of a tooth caused by clinically or radio logically evident anatomical barrier in its eruption pathway or due to its ectopic position.<sup>21</sup> Impacted mandibular third molar is reported to be present in 33% of population which needs surgery for its removal, hence surgical disimpaction of third mandibular molar is most common surgical procedure performed in dental clinics.<sup>11</sup> Third molar of lower jaw comprise bulk of impacted teeth.<sup>22</sup> Major surgical postoperative complications include the pain, swelling and trismus.<sup>23,24</sup>

Flap designing plays major role in visibility to reach impacted tooth, and better healing of surgical wound. Various surgical incisions had been practiced to create a surgical flap. These include Standard Ward's incision, Modified Ward's incision, envelope (Koener's) incision and Bould Henry 'S'-shaped incision, etc.<sup>20,25-29</sup> Ward's and Modified Ward's incision are frequently used in surgical practice. The beauty of Ward's and Modified Ward's incision lies in their excellent visibility, mechanical ease and easy closure by suturing between the buccal and lingual soft tissues.<sup>1,4,8</sup>

Pasha et al reported more male population compared to female which is consistent to the present study.<sup>1</sup> Similarly Kumar et al has also reported predominant male population which is also consistent to the present study.<sup>4</sup>

Post-operative pain after third molar surgery presents itself as a localized inflammation with pain of varying intensities.<sup>1</sup> Moderate to severe pain more often than not produces within the initial 12 hours, with the peak intensity appearing after around 6 hours when a traditional nearby anesthetic agent is utilized.<sup>1</sup> The pain then bit by bit vanishes inside a couple days if the wound heals normally.<sup>1,4</sup> In the present study, a comparison was made of pain for standard Ward's incision and Comma incision. Pain was assessed on visual analogue scale (VAS). VAS was further categorized into no pain, mild, moderate and severe pain.

Post-operative pain after third molar surgery presents itself as a localized inflammation with pain of varying intensities. The removal of the impacted third molar and the resultant tissue and cellular destruction cause the release and production of several biochemical mediators which are involved in pain process, particularly, histamine, bradykinin and the prostaglandins.<sup>30,31</sup> Lower pain scores were recorded with comma incision sides as compared to standard incision sides, which was similar to that which was seen in the study of Nageshwar.<sup>19</sup> This result did not correlate with the result of Gool et al., as they had elicited that severity in pain after removal of third molars did not appear to be related to the type of incision.<sup>32</sup>

The present study reports reduction in Pain on VAS in Comma incision compared to standard Ward's incision. Furthermore, all the mentioned previous studies used same scale in assessing the pain. As it might be easy to explain the patients and easily understood by the patient.

Post-operative pain on Day 1 (Chi- value 4.24 and  $p= 0.1198$ ), Day 3 (Chi- value 11.56 and  $p= 0.0091$ ) and Day 7 (Chi- value 15.22 and  $p= 0.0005$ ) showed statistically significant reduction in Comma incision compared to standard Ward's incision. Results of postoperative pain on Days 1, 3 and 7 are depicted in Table-IV. The finding of present study of low pain score in Comma incision is consistent to previous studies.<sup>1,4,19</sup> Bodh et al, and Dalanmaz compared two incision design (envelope and standard ward) incision in his study, had reported no statistically difference between the two types of incision regarding post-operative pain. The finding of above studies are in contradiction to present study.<sup>33-35</sup>

## CONCLUSION

Coma incision was superior over the conventional method- the standard Ward's incision, as lesser degree of post-operative pain was seen. Further research with newer flap designs like the comma design, should be considered in the extraction of impacted third molar surgery on a larger number of patients.

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



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