Original Article

Evaluation of Postoperative Complications and Patient Satisfaction in Third Molar Surgical Extraction Techniques: A Clinical Study

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ABSTRACT

Objective: To evaluate the post-operative complications and patients satisfaction after surgical extraction of third molar using two different techniques comma incision and standard Wards incision

Study Design: Randomized controlled Trial study

Place and Duration of Study: This study was conducted at the Dental OPD of Institute of Dentistry, CMH Lahore Medical College, Lahore, from January 2022 to December 2022.

Methods: The study included 96 patients with impacted mandibular 3rd molars. Group A (48 patients) had comma-shaped incision surgery, while Group B (48 patients) had Ward's incision surgery. Patients aged 18–45 were selected, except for trismus, pregnancy, oral submucous fibrosis and limited mouth opening. Chi-square and paired t-tests assessed post-operative complications in these surgeries.

Results: In group A mean age was 32.5 ± 5.7 years and in group B mean age was 33.2 ± 3.9 years. In Group A, 62.5% are male and 41.7% are female, while in Group B, 37.5% are male, and 58.3% are female. In this study, Group A experienced higher postoperative pain levels than Group B, notably on the 1st and 3rd post-op days, while Group B exhibited faster pain relief by the 7th day. Mouth opening was initially lower in Group A but equalized by the 7th day, and Group A consistently had more swelling, especially on the 1st and immediately post-op days. Pocket depth was higher in Group A immediately post-op and on subsequent days. Furthermore, wound healing was significantly better in Group B. Patient satisfaction showed no significant difference between the two groups.

Conclusion: The study found that the newly developed comma-shaped incision design was superior to the traditional method (Ward's incision) because it resulted in fewer complications after surgery.

Key Words: Comma incision, Pain, Impacted Third Molar, Ward's incision, Complications, Trismus

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INTRODUCTION

One of the most prevalent oral surgical operations is removal of the third molar representing 18% of dental extractions.

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The eruption of the third molars occurs between the ages of 17 and 22 years, however development begins between the ages of 8 and 15 years.[1]

Mandibular third molars frequently experience some degree of impaction as a result of this delayed eruption, with prevalence rates ranging from 17 to 69%. The third branch of the fifth cranial nerve the inferior alveolar nerve (IAN), provides sensory function to the lower cheek, chin, lip, tongue, gingivae, and teeth, making extraction of the third molars a particularly challenging procedure.[2,3] Odontectomy, the surgical removal of an impacted tooth, is commonly performed on mandibular third molars due to the high prevalence of impaction in this dental location.[4]

Bleeding, prolonged discomfort, swelling (edema), nerve injury and trismus are some of the postoperative complications that can occur after extraction of an impacted mandibular third molar.[5] The complication incidence ranges from 2.6% to 30.9%. Risk factors for postoperative complications have been studied in recent years. These factors include patient characteristics like age and sex, surgical procedures, impacted tooth level

and skills of operator. Therefore, it is essential to assess the degree of surgical difficulty prior to the procedure in order to determine the likelihood of success.[6,7]

Surgical removal is associated with a higher risk of postoperative complications because of the need to manipulate both soft and hard tissues. As a result, it's crucial to find ways to reduce the occurrence of these difficulties, and that requires an in-depth understanding of the elements that contribute to them.[8] The design of the incision and flap plays a role in the postoperative outcome of third molar surgery. The flap must be designed in such a way that the impacted tooth can be seen and accessed easily, and it must also be designed such that the surgically caused defect may heal properly.[9] Comma incisions reduce discomfort and swelling. Since then, comma incision utility has never been properly examined, and flap credibility in avoiding postoperative problems and providing enough surgical access must be determined.[10] Standard ward incision curves anteriorly from the distobuccal corner of the lower second molar crown to the mesiobuccal cusp. Incision is then carried distally to the external oblique ridge, level with the buccal surface of the tooth.[11]

The rationale for conducting this study lies in the scarcity of local data regarding postoperative complications and patient satisfaction specifically related to third molar extraction techniques. Understanding these outcomes locally can help tailor surgical approaches, improve patient care, and inform clinical decision-making, ultimately enhancing the quality of oral surgery services in our region.

METHODS

After taking permission from institutional review board of hospital this study was conducted at the Dental OPD of Institute of Dentistry, CMH Lahore Medical College, Lahore, spanning from January 2022 to December 2022. Physically fit individuals aged 18 to 45 were enrolled. Moreover, participants had no severe systemic illnesses, ensuring a homogeneous and representative sample for the investigation. Patients with significant systemic illnesses, solitary third molars, and severely decayed third molars were excluded from the study. Patients were randomly divided in two groups, Group A had their third mandibular teeth extracted using a conventional Ward's incision. Group B had a comma incision made to remove their third mandibular molars. To eliminate any interoperative bias, a sole surgeon conducted all extractions, while data collection was assigned to a designated individual.

Collected data of study was analyzed using SPSS version 23.0. Data for numerical and categorical variables were collected. Normally distributed measurements were represented as means standard deviations (S.D.), and a t-test was used to compare the complications in two groups, while a chi-square test was used to compare descriptive statistics. If the value of P is less than 0.05, then there is a significant difference.

RESULTS

Group A (mean age: 32.5 ± 5.7) and Group B (mean age: 33.2 ± 3.9) differ slightly in age distribution. In Group A, 62.5% are male and 41.7% are female, while in Group B, 37.5% are male, and 58.3% are female. Group A consists of 83.3% non-smokers and 16.7% light-smokers, whereas Group B has 87.5% non-smokers and 12.5% light-smokers. Both groups have a similar history of pericoronitis, with approximately 9-10% of patients reporting a history of pericoronitis (Table 1).

Preoperatively, pain levels were similar between Group A (0.12 ± 0.003) and Group B (0.21 ± 0.002). However, Group A experienced significantly higher pain on the 1st post-operative day (4.60 ± 1.27) compared to Group B (3.35 ± 1.18), continuing through the 3rd post-operative day (2.93 ± 0.03 vs. 1.46 ± 0.03). By the 7th day, Group B had significantly lower pain levels (0.15 ± 0.01) than Group A (0.90 ± 0.01), indicating faster pain relief. Preoperatively, trismus was similar between Group A (37.28 ± 1.10) and Group B (38.45 ± 0.98). Immediately post-op, Group B had significantly higher trismus (36.56 ± 1.12) than Group A (33.18 ± 1.25). This trend continued on the 1st post-op day (26.24 ± 1.11 vs. 16.30 ± 1.18) but equalized by the 7th day. In terms of swelling, Group A consistently had higher levels, significantly so on the 1st day (7.21 ± 2.42 vs. 11.13 ± 6.08) and immediately post-op (9.21 ± 2.42 vs. 13.13 ± 6.08). However, by the 7th day, no significant difference remained, indicating similar swelling levels in both groups during recovery.

Preoperatively, mouth opening did not significantly differ between Group A (42.56 ± 4.28) and Group B (45.31 ± 5.43) ($p = 0.129$). However, immediately post-operatively (3h), Group A exhibited significantly reduced mouth opening (28.72 ± 3.89) compared to Group B (32.47 ± 4.65) ($p = 0.028$). On the 1st post-operative day (24h), Group A continued to have less mouth opening (32.88 ± 3.58) than Group B (36.67 ± 4.46) with a significant difference ($p = 0.018$). By the 3rd post-operative day (72h), Group A's mouth opening improved (37.34 ± 3.66) but remained less than Group B (41.19 ± 4.58) ($p = 0.024$). On the 7th post-operative day (1wk), Group A (41.71 ± 4.05) still had less mouth opening than Group B (45.29 ± 4.01) with a significant difference ($p = 0.021$). Preoperatively, pocket depth did not significantly differ between the groups ($p = 0.067$). Immediately post-operatively (3h), Group A showed higher pocket depth (7.52 ± 0.71) compared to Group B (6.34 ± 0.94) with a significant difference ($p = 0.001$). On the 1st post-operative day (24h), Group A's pocket depth (5.94 ± 1.20) remained higher than Group B (4.87 ± 0.50) with a significant difference ($p = 0.003$). By the

3rd post-operative day (72h), Group A's pocket depth (4.34 ± 1.42) remained higher than Group B (3.28 ± 0.68) (p = 0.015). On the 7th post-operative day (1wk), Group A (3.28 ± 0.94) still had higher pocket depth than Group B (2.41 ± 0.49) with a significant difference (p = 0.016). It was determined that 91.66 percent of those in Group A had made sufficient progress in their healing, whereas 97.1 percent of those in Group B had done so. There was a statistically significant improvement in wound healing in group B as shown in table 2.

Table No 1. Characteristics of the Study Sample at a baseline

Variables	Characteristics	Group A Ward's incision	Group B Comma Incision	P-values
Age	Mean±SD	32.5 ± 5.7	33.2 ± 3.9	0.068
Gender	Male	30 (62.5%)	18 (37.5%)	0.156
	Female	20 (41.7%)	28 (58.3%)	0.072
Smoking Status	Non-Smoker	40 (83.3%)	42 (87.5%)	0.001
	Light-Smoker	08 (16.0%)	06(12.0%)	0.000
History of Pericoronitis	Yes	9.4% (5)	10.4% (5)	0.876
	No	90.6% (43)	89.6% (43)	

Table No.2: The mean values for the post-operative complications in ward's incision & comma incision group patients

Post-operative Complications	Characteristics	Group A Ward's incision	Group B comma incision	P value
Pain	Preoperative	0.12 ± 0.003	0.21 ± 0.002	0.50
	Immediate post-op (3h)	5.38 ± 1.18	5.20 ± 1.09	0.08
	1st post-op day (24h)	4.60 ± 1.27	3.35 ± 1.18	0.03
	3rd post-op day (72h)	2.93 ± 0.03	1.46 ± 0.03	0.01
	7th post-op day (1wk)	0.90 ± 0.01	0.15 ± 0.01	0.001
Trismus	Preoperative	37.28 ± 1.10	38.45 ± 0.98	0.89
	Immediate post-op (3h)	33.18 ± 1.25	36.56 ± 1.12	0.01
	1st post-op day (24h)	16.30 ± 1.18	26.24 ± 1.11	0.04
	3rd post-op day (72h)	11.30 ± 1.12	18.23 ± 1.11	0.02
	7th post-op day (1wk)	28.42 ± 1.15	38.34 ± 1.11	0.01
Swelling	Preoperative	00	00	--
	Immediate post-op (3h)	13.13 ± 6.08	9.21 ± 2.42	0.001
	1st post-op day (24h)	11.13 ± 6.08	7.21 ± 2.42	0.001
	3rd post-op day (72h)	8.95 ± 6.09	7.11 ± 3.70	0.20
	7th post-op day (1wk)	2.41 ± 3.21	2.18 ± 2.23	0.70
Mouth Opening	Preoperative	42.56 ± 4.28	45.31 ± 5.43	0.129
	Immediate post-op (3h)	28.72 ± 3.89	32.47 ± 4.65	0.028
	1st post-op day (24h)	32.88 ± 3.58	36.67 ± 4.46	0.018
	3rd post-op day (72h)	37.34 ± 3.66	41.19 ± 4.58	0.024
Pocket Depth	Preoperative	2.74 ± 0.43	2.32 ± 0.46	0.067
	Immediate post-op (3h)	7.52 ± 0.71	6.34 ± 0.94	0.001
	1st post-op day (24h)	5.94 ± 1.20	4.87 ± 0.50	0.003
	3rd post-op day (72h)	4.34 ± 1.42	3.28 ± 0.68	0.015
	7th post-op day (1wk)	3.28 ± 0.94	2.41 ± 0.49	0.016
Wound Healing	7th post-op day (1wk)	44(91.66%)	47(97.91%)	0.001

Table 3: Comparison of patients' satisfaction following surgical extraction procedures

Patient Satisfaction Grade	Group A (n = 48)	Group B (n = 48)	Chi-square Test	P-value
Very Satisfied	20 (41.67%)	23 (47.92%)	$\chi^2 = 0.725$	p > 0.05 (NS)
Fairly Satisfied	17 (35.42%)	15 (31.25%)		
Fairly Unsatisfied	7 (14.58%)	7 (14.58%)		
Very Unsatisfied	4 (8.33%)	3 (6.25%)		

Regarding patient satisfaction grades following a surgical procedure, comparing Group A and Group B. Group A, consisting of 48 patients, showed that 41.67% of patients were "Very Satisfied," while 35.42% were

"Fairly Satisfied," 14.58% were "Fairly Unsatisfied," and 8.33% were "Very Unsatisfied." In contrast, Group B, also comprising 48 patients, had 47.92% "Very Satisfied," 31.25% "Fairly Satisfied," 14.58% "Fairly Unsatisfied," and 6.25% "Very Unsatisfied." As shown in table 4.

DISCUSSION

Considering the evolutionary trend, it's not surprising that the third molar in the mandible is routinely extracted through surgery. Complications during or after third molar surgery are a common cause of postoperative pain in patients. Patients frequently complain of discomfort, swelling, pocket depth, trismus, dehiscence, alveolar osteitis, infection, nerve injury, and damaged periodontal tissue. It can be difficult for doctors to keep patients from developing problems after surgery. It is common for patients to experience pain, swelling, and trismus after having their impacted third molars out. A VAS, or visual analogue scale, was used to quantify the degree of discomfort. Techniques such as atraumatic incisions, aseptic drug administration and physiotherapy, suturing technique, and surgical technique can all help reduce postoperative complications.[12,13]

In this our study, mean age in Group A (32.5±5.7) and Group B (33.2±3.9) differ slightly in age distribution. It was similar to the findings of Sharma et al. (2020) research, the mean age of group A was 29.65±7.5 years, whereas the mean age of group B was 28.74±5.7 years.[14] The present study is consistent with a finding by Pasha et al. (2017)[15] that there are more men than women.[15] Similar to the present study, Kumar et al. (2015) found a dominance of male patients.[16]

The current study found that the Comma incision caused less pain on the visual analogue scale (VAS) than the traditional Ward's incision. The present study found that the comma incision group had statistically significant lower pain scores on the first postoperative day compared to the Ward's incision group (4.60±1.27 vs. 3.35±1.18), and that the comma incision group had proportionally lower pain scores on the third, and seventh postoperative days, but that these differences were statistically significant (0.90±0.01 vs. 0.15±0.01; P<0.05). This may be because micro incisions inflict less damage to surrounding tissues than traditional incisions. The findings here are consistent with those of Nageshwar et al. (2012)[17] and Neelkandan et al. (2015).[18]

There is a statistically significant difference (P <0.05) between the two flap designs in this study's measurement of trismus at immediate, first day, and third day postoperatively. As a result, trismus was more common in the Ward's incision group than in the comma incision group. This may be because the third molar region's unique shape helps to preserve vital anatomical features. The findings here are consistent with those of Nageshwar et al. (2012)[17] and Neelkandan (2015).[18] in our study group B (comma incision) demonstrated significantly better wound healing progress, with 97.1% achieving sufficient healing compared to 91.66% in Group A (standard Ward's incision). The findings of Jakse et al. (2012) provide credibility to the hypothesis that a third molar disimpaction procedure is significantly complicated by incision.[19]

Group A (42.56 ± 4.28 mm) had slightly less preoperative mouth opening than Group B (45.31 ± 5.43 mm) (p = 0.129). However, Group A showed significantly reduced mouth opening post-surgery (3h), continuing through the first (24h) and third (72h) post-op days (p < 0.05). On day seven, Group A still had less mouth opening (41.71 ± 4.05 mm) than Group B (45.29 ± 4.01 mm) (p = 0.021). Swelling was initially higher in Group A, but by day seven, both groups had similar swelling levels. These findings align with previous studies by Kumar et al. (2015)[15], Pasha et al. (2017)[16], and Nageshwar et al. (2012).[17], Jakse et al. (2012)[19] & Syed et al. (2019).[20]

The low sample size, the testing of only a few different factors, and the use of only two different incisions were all limitations of the study. Extraction of impacted third molars necessitates incisions, and further comparison research with larger sample sizes are needed to better assess the outcomes of either procedure.

CONCLUSION

Less postoperative complications were seen with the coma incision compared to the more traditional Ward's incision. Newer flap designs, such as the comma shape, should be considered in further research in the extraction of impacted third molars.

Author's Contribution:

Concept & Design of Study:	Fareed Ahmad
Drafting:	Muhammad Shairaz Sadiq, Ali Farooq
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Revisiting Critically:	Fareed Ahmad, Muhammad Shairaz Sadiq
Final Approval of version:	Fareed Ahmad

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