

Original Article

COMPARISON OF PAIN AND SWELLING IN PATIENTS WITH AND WITHOUT GRAFT PLACEMENT AFTER THIRD MOLAR EXTRACTION

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ABSTRACT:

Introduction: Third molar removal in oral surgery has become a common practice and it causes an acute inflammation with intense discomfort as well as pain, trismus and swelling during the postoperative period. **Aim and Objectives:** The present study explores the effect of graft placement on secondary factors pain and swelling after lower third molar surgical removal. **Material and Methods:** Secondary parameters pain and swelling was compared among all the three groups. In all the groups, the patients were asked for pain at the operated site on 1st review (post-op 2nd day), 2nd review (post-op 7th day) & 3rd review post-op 1 month). Facial swelling was measured preoperatively, after 2 days, 7 days postoperatively using visual scoring on clinical observation. The data were collected and entered into a Microsoft Excel Worksheet and analyzed using SPSS (version 7.5) statistical package. Chi square test and Anova test was applied to find the statistical correlation and p value <0.05 was considered significant. **Results:** On second post-op day, 2 (9.52%) of patients from group I (G-graft) had severe pain, 3 (14.28%) had moderate pain, and 16 (76.19%) patients had mild pain. In group II (G bone), 19 (90.47%) had mild pain, and 2 (9.52%) patients had moderate pain. In group III (Control) 17 (80.95%) had mild pain, and 4 (19.4%) patients had moderate pain. The relation of pain scores on day 2, day 7 (P_7D), day30 (P_30D) between groups was found not significant (p>0.05). Cases of facial swelling was more in control group, the relation of a swelling scores on day 2 between groups was found not significant (p >0.05). The relation between different swelling scores on day 2 and difficulty score in Group I, Group II, Group III was found to be significant (p<0.05) (table 7). The relation between duration of surgery and swelling in Group I, II and III was found to be highly significant (p<0.05). **Conclusion:** The present study concluded that G-Graft can be used in bony defects to enhance the bone healing and provokes less inflammatory process as compared to cases without graft. Pain and swelling had highly significant correlation with difficulty score and duration of surgery

Key words: Impacted tooth, Postoperative swelling, Pain, Graft placement.

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I**NTRODUCTION:** Surgery always result in tissue injury characterized by hyperemia, vasodilatation, increased capillary permeability with liquid accumulation in the interstitial space and granulocyte and monocyte migration, due to the increased osmotic pressure in capillaries according to Starling law. Edema is the expression of exudates or transudation, and in surgery, probably both the events take place.¹ Third molar removal in oral surgery has become a common practice and it causes an acute inflammation with intense discomfort as well as pain, trismus and swelling during the postoperative period. Pain sensation is subjective and can be influenced by different factors

such as patient age, sex, anxiety and surgical difficulty. The present study explores the effect of graft placement on secondary factors pain and swelling after lower third molar surgical removal.²

MATERIAL AND METHODS:

The study was carried out in the Department of Oral & Maxillofacial Surgery, Regional Dental College, Assam within the period of ten months with effect from February to November 2011. Sixty three patients, who came to the department for extraction of mandibular third molar under local anesthesia, were selected randomly for the study. The surgery was carried out in the minor OT as an outpatient procedure. Patients were randomly divided into

three equal groups (groups I-G Graft, II-G-Bone, III-control) containing of twenty one patients each. A signed written informed consent was taken. All patients were operated on by the same surgeon using a standard operating technique. An envelop mucoperiosteal flap was raised, extension of which varied in each case depending upon the access required. Bone was removed (if indicated) on the buccal and distal aspect of the third molar with a number 703 straight fissure carbide bur (incorporated in straight handpiece attached to physiodispenser under constant sterile 0.9% saline irrigation. Tooth elevation, crown removal and or root division and elevation were carried out as and when required. After removal of the tooth the surgical field was meticulously rinsed with sterile 0.9% saline. In Group I, G- graft material was taken and packed in the extraction socket. In Group II, G bone was packed in the extraction socket. In Group III, no graft placement was done. The wound was closed by placing 3-0 braided silk interrupted sutures and a water tight seal achieved. Post-operative instructions were given and medicine was prescribed (Tab. ORDENT/BD X 5 days, tab. ZERODOL-SP/BD X 3 days, Clohex mouthwash gargle QID). Secondary parameters pain and swelling was compared among all the three groups. In all the groups, the patients were asked for pain at the operated site on 1st review (post-op 2nd day), 2nd review (post-op 7th day) & 3rd review post-op 1 month). It was recorded using the scoring system i.e., None (0), Mild (1), Moderate (2) and Severe (3).³ Facial swelling was measured preoperatively, after 2 days, 7 days postoperatively using visual scoring on clinical observation. It was recorded using scoring system i.e., None (absent) – 0, Mild (just visible & palpable)-1, Moderate (obvious)-2, Severe -3.⁴

The data were collected and entered into a Microsoft Excel Worksheet and analyzed using SPSS (version 7.5) statistical package. Chi square test and Anova test was applied to find the statistical correlation and p value <0.05 was considered significant.

RESULTS:

Among the sixty three patients, there were 45 males and 18 females with Group I (G Graft) consisting of 14 (66.66%) males & 7 (33.33%) females, with group II (G Bone) consisting of 15 (71.42%) males and 6 (28.57%) females, with group III(control) consisting of 16 (76.19%) males and 7 (38.09%) females. On second post-op day, 2 (9.52%) of patients from group I (G-graft) had severe pain, 3 (14.28%) had moderate pain, and 16 (76.19%)

patients had mild pain. In group II (G bone), 19 (90.47%) had mild pain, and 2 (9.52%) patients had moderate pain. In group III (Control) 17 (80.95%) had mild pain, and 4 (19.4%) patients had moderate pain. On seventh post-op day, 19 (90.47%) patients from group I had mild pain, 1 (4.76%) had moderate pain, 1 (4.76%) had no pain. In group II, 20 (95.24%) had mild pain, and 1 (4.76%) had no pain. In group III, 16 (76.19%) had mild pain, and 4 (19.4%) patients had no pain, and 1 (4.76%) had moderate pain. After one month post-op, only 3(14.28%) in group I, 17(80.98%) in group II, and 3(14.28%) in group III and had mild pain, while rest of the patients had no pain (table 1). The relation of pain scores on day 2 between groups was found not significant ($p>0.05$). The relation of pain scores on day 7 (P_7D) between groups was also found to be not significant ($p>0.05$). The relation of pain scores on day30(P_30D) between groups was found to be not significant ($p>0.05$). Facial swelling was measured preoperatively, after 2 days, 7 days postoperatively using visual scoring on clinical observation. It was recorded using scoring system i.e., None (absent) – 0, Mild 1, Moderate 2 and Severe -3 (table 3). Preoperatively, none of the patients had any visible swelling. On second post op day, 45(71.19%) patients were found to have mild swelling of which 15 (71.4%) were of Group I G graft, 14 (66.66%) were of Group II G Bone, 16 (76.19%) were of Group III Control, 18 (28.58%) patients presented with moderate swelling of which 6 (28.57%) were of Group I, 7 (33.33%) were of Group II, 5 (23.80%) were of Group III. None of the patients presented with severe swelling. On seventh post-op day again, none of the patients had any visible swelling. However, incidence of swelling was more in control group, the relation of a swelling scores on day 2 between groups was found not significant ($p >0.05$) (table 4). The relation between different swelling scores on day2 and difficulty score in Group I (table 5), Group II (table 6), Group III was found to be significant ($p<0.05$) (table 7). The relation between duration of surgery and swelling in Group I, II and III was found to be highly significant ($p<0.05$).

DISCUSSION

Third molar surgery result in physical injury to the tissues and are therefore followed by inflammatory reaction.^{5,6} It has been proposed that following tissue injury or inflammation, there is a sequential release of mediators from mast cells, the vasculature and other cells. Histamine and serotonin appear first, followed shortly after by

Table 1: Shows measurement of pain

Group	Pain	Days					
		2		7		30	
		N	%	N	%	N	%
I(G Graft)	None (0)			1	4.76%	17	80.98%
	Mild (1)	16	76.19%	19	90.47%	3	14.28%
	Moderate (2)	3	14.28%	1	4.76%		
	Severe (3)	2	9.52%				
II(G Bone)	None (0)			1	4.76%	17	80.95%
	Mild (1)	19	90.47%	20	95.24%	2	9.52%
	Moderate (2)	2	9.52%				
	Severe (3)						
III(Control)	None (0)			4	19.04%	18	85.71%
	Mild (1)	17	80.95%	16	76.19%	3	14.28%
	Moderate (2)	4	19.04%	1	4.76%		
	Severe (3)						

Table 2: Relation of pain scores post-operatively

Post operative day	p value(Chi-Square Test)
P_2D	0.181889(NS)
P_7D	0.345794(NS)
P_30D	0.866596(NS)

Table 3: Shows swelling scores

Groups	Swelling by group on day 2				Swelling by group on day 7			
	None	Mild	Moderate	Severe	None	Mild	Moderate	severe
I(G Graft)	0	15	6	0	21	0	0	0
II(G Bone)	0	14	7	0	21	0	0	0
III(contol)	0	16	5	0	21	0	0	0
Overall	0	45	18	0	0	0	0	0

Table 4: Relation between Swelling & Groups on day 2

Group	Nil	Mild	Moderate
I(G Graft)		15	6
II(G Bone)	1	14	6
III (control)		16	5
Chi-sq test	0.6897075(NS)		

Table 5: Group I (G Graft): Swelling by Difficulty on Day 2

SWELLING	DIFFICULTY SCORE				Overall
	3	4	5	6	
Mild 1	1	8	3	3	15
Moderate 2			1	5	6
Total	1	8	4	8	21
Chi-sq test	0.043253846(S)				

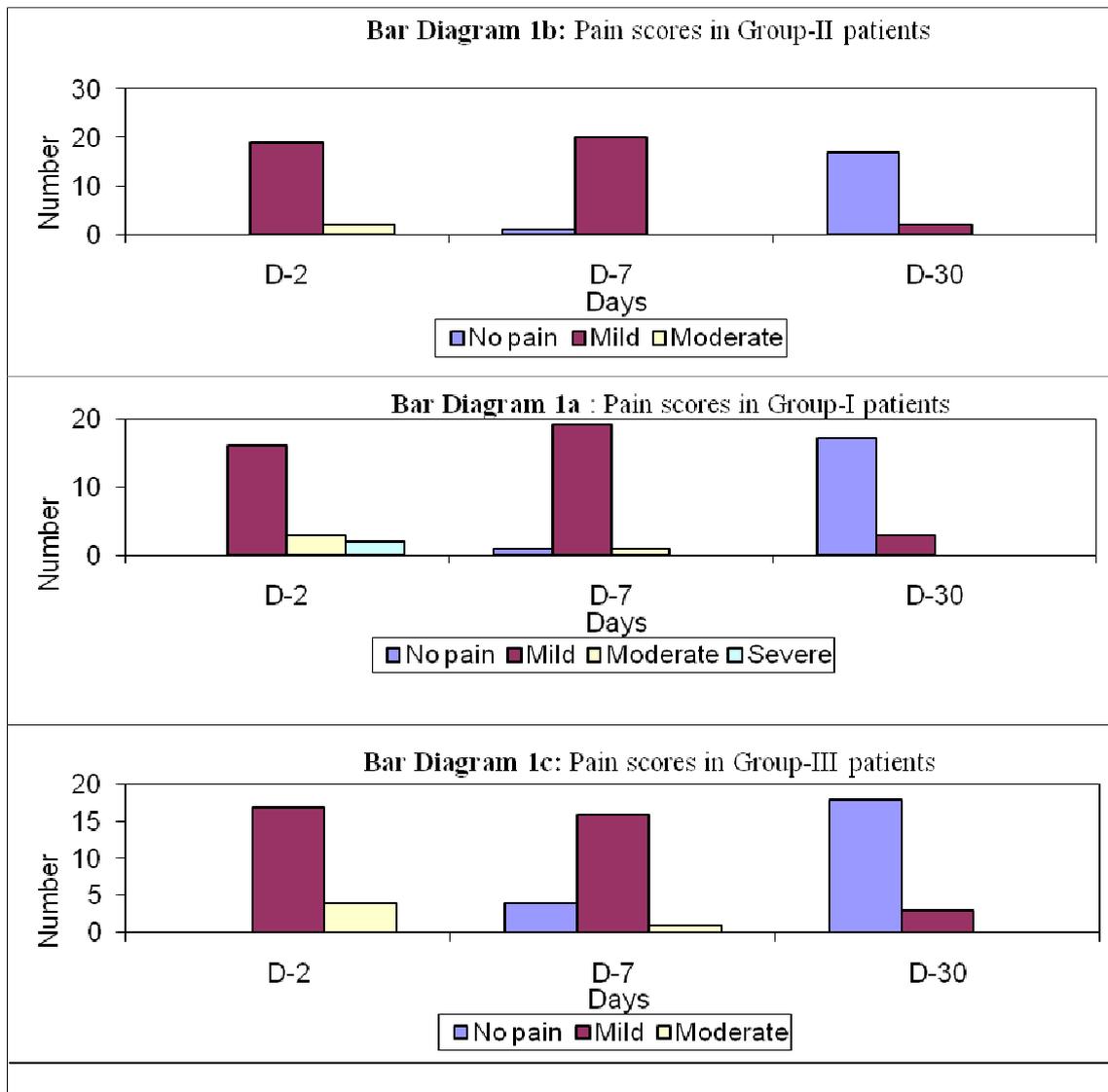


Table 6: Group II (G Bone): Swelling by difficulty on Day 2

SWELLING	DIFFICULTY SCORE					Total
	3	4	5	6	7	
Nil 0			1			1
Mild 1	2	9	2	1		14
Moderate 2			2	2	2	6
Total	2	9	5	3	2	21
Chi-sq test	0.044(S)					

Table 7: Group III (control): Swelling by difficulty on day 2

SWELLING	DIFFICULTY SCORE							Total
	3	4	5	6	7	8		
Mild 1	3	4	5	4			16	
Moderate 2			1	1	1	2	5	
Total	3	4	6	5	1	2	21	
Chi-sq test	0.035(S)							

Table 8: Shows association of average of duration of surgery with swelling on day 2

Group	Swelling on Day 2			
	0 (none)	1 (Mild)	2 (Moderate)	3 (Severe)
I(G Graft)		34 mins	45 mins	0
II (G Bone)		31.42857 mins	39.16667 mins	0
III (Control)		21.875 mins	34 mins	0

Table 9: Duration of surgery with swelling

Groups	p value(Annova test)
I	0.001(HS)
II	0.01(S)
III	0(HS)

bradykinnin and later prostaglandins and other eicosanoids. Bradykinnin has been shown to produce pain in man when given intradermally, intraarterially or intraperitoneally and the hyperalgesia associated with prostaglandin is also due to its potentiation of Bradykinnin effect.⁶ Postoperative swelling results from accumulation of protein rich exudates within the surrounding tissue and trismus occurred as a result of spasm of muscle fibres following inflammatory processes. These reactions (pain, swelling and trismus) may be a consequence of the formation of prostaglandins and other mediators of inflammation derived from membrane phospholipids, which are released following surgery.^{5,7}

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage⁸ and thus difficulty score and duration of surgery can be associated with increased pain.

In our study, the patients were asked for pain at the operated site on 1st review (post-op 2nd day), 2nd review (post-op 7th day) & 3rd review post-op 1 month). It was recorded using the scoring system i.e., None (0), Mild (1), Moderate (2), & Severe (3).³ On second post-op day, 2 (9.52%) of patients from group I had severe pain, 3 (14.28%) had moderate pain, and 16 (76.19%) patients had mild pain. In group II, 19 (90.47%) had mild pain, and 2 (9.52%) patients had moderate pain. In group III, 17 (80.95%) had mild pain, and 4 (19.4%) patients had moderate pain. All the patients were under analgesic & anti-inflammatory (zerodol-sp-I tab BD) coverage at that time but in the 2 patients from group I who had complained of severe pain zerodol-sp was replaced with calpol-T + bedanzen forte

(both TDS), which subsequently relieved the patient pain.

On seventh post-op day, 19 (90.47%) patients from group I had mild pain, 1 (4.76%) had moderate pain, 1 (4.76%) had no pain. In group II, 20 (95.24%) had mild pain and 1 (4.76%) had no pain. In group III, 16 (76.19%) had mild pain, and 4 (19.4%) patients had no pain, and 1 (4.76%) had moderate pain. Only 2 patients having moderate pain (1 each from Group I & III) were taking analgesics once a day.

On one month post-op, only 3(14.28%) in group I, 17(80.98%) in group II, and 3(14.28%) in group III and had mild pain, while rest of the patients had no pain.

On analyzing statistically, we found that, pain scores in all groups and on each review (2nd post-op, 7th post-op and 1 month post-op) had highly significant correlation ($p < 0.01$) with difficulty score & duration of surgery. These results are similar to those reported by KIM et al,⁹ Pedersen,¹⁰ Sandhu A et al,¹¹ who stated that increased duration of surgery was associated with significantly higher pain scores on days 1 and 7. Mendez et al¹² reported a significant association between the two variables, but only on postoperative day 1. Bello AS et al⁷ found a positive correlation with type of impaction with pain and observed steady increase in severity of pain with increased operation time despite the fact that the difference was not statistically significant. They did not find any correlation with sex, but found that the older patients were having low pain threshold. Though in our study, 2 patients (both from Group I and both females) were having severe pain on the 2nd post-op day, no significant correlation could be drawn either between sex or age ($p > 0.05$) (table 1).

Also we could not find any correlation of pain score on different review days with different groups as in our study. (2nd post-op day- $p = 0.181$, 7th post-op day- $p = 0.3943$, & 1 month post-op- $p = 0.8686$) (table 2).

Swelling is an expected sequela of third molar surgery. Postoperative swelling after removal of mandibular third molar has been attributed to the reflection of mucoperiosteum.^{13,14} It reaches a maximum 2–3 days postoperatively and normally subsides by the fourth day. It should completely resolve by the seventh postoperative day.⁴

In our study, facial swelling was measured preoperatively, after 2 days, 7 days postoperatively using visual scoring on clinical observation. It was recorded using scoring system i.e., None (absent) – 0, Mild -1, Moderate 2, & Severe -3. Preoperatively, none of the patients had any visible

swelling.⁴ None of the patients had pre-op swelling in our study. On second post op day, 45(71.19%) patients were found to have mild swelling of which 15 (71.4%) were of Group I, 14 (66.66%) were of Group II, 16 (76.19%) were of Group III, 18 (28.58%) patients presented with moderate swelling of which 6 (28.57%) were of Group I, 7 (33.33%) were of Group II, 5 (23.80%) were of Group III. None of the patients presented with severe swelling. Our findings were in accordance with Siddiqi A et al.⁴

On analyzing statistically (ANOVA, Chi Square test & Pearson's correlation test), we found highly significant correlation ($p < 0.01$) with difficulty score (table-7a-g,&9), which is similar to the results of Gool et al,¹³ Siddiqi A,⁴ and Bello AS et al.⁷ However contrary to this, Sandhu A et al found no significant relationship between them. We also found highly significant correlation ($p < 0.01$) of post-op swelling with duration of surgery (table 5-9) which is in accordance with the study carried out by Siddiqi A,⁴ Bello SA et al⁷ and Kim et al.⁹ However in the studies carried out by Pedersen¹⁰ and Sandhu A et al,¹¹ the degree of postoperative swelling was not influenced by duration of surgery. Tiwana et al¹⁵ reported data on patients undergoing surgery for extraction of impacted molars. Patients were divided in two groups: the first group was administered with 8 mg desamethasone IV and the second one with 40 mg methylprednisolone IV. It was concluded that preoperative administration of corticosteroids IV has a better outcome, even in the absence of antibiotic therapy, as suggested by 8% of patients with slight swelling versus 28% in the control untreated group. Assessment of swelling in the present study was done on visual analog basis which can result in bias. Thus quantitative assessment of swelling needs carried for accurate measurement. In contrast, by evaluating the swelling by ultrasonography and CT, Esen et al¹⁶ observed a significant reduction with preoperative administration of 125 mg methylprednisolone IV, and 500 mg penicillin orally, for 5 days following surgery. However, no corticosteroids were used in the present study, only effect of graft and non graft was compared.

CONCLUSION: The present study concluded that G-Graft can be used in bony defects to enhance the bone healing and provokes less inflammatory process as compared to cases without graft. However, other variables like age group of patient, gender influence must be considered in future prospective blind study in human with greater

sample size and long term follow-up to conclude the desire statistically acceptable result.

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