

Comparing Pain and Trismus in “Primary” and “Secondary” closure of surgical wound after removal of Impacted Mandibular Third Molar

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Author's Contribution

¹ Conception of study
^{1,2} Experimentation/Study conduction
² Analysis/Interpretation/Discussion
³ Manuscript Writing
³ Critical Review
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Abstract

Introduction: Surgical removal of third molars is a routine procedure in Oral and Maxillofacial units. Different techniques are adopted by oral and maxillofacial surgeons for surgical wound closure such as primary and secondary closure. The objective of this study is to compare post-operative surgical complications such as pain and trismus in primary and secondary closure techniques after the surgical removal of the impacted mandibular third molar.

Methods: This randomized control trial was conducted in the Oral and Maxillofacial Department, Armed Forces Institute of Dentistry Rawalpindi. A total of 60 patients, 30 in each treatment group were included, Group 1 went under primary closure and Group 2 secondary closure. Pain assessment was done using visual analogue scale VAS and trismus calculated measuring inter incisal opening on the 7th post-operative day. Data was analysed using SPSS- 18. Descriptive statistics were employed for quantitative variables. Mean and standard deviation calculated. An independent sample t-test was used to compare mean pain and trismus between two groups. P-value ≤ 0.05 was considered significant.

Results: Out of 60 patients 37(61.7%) were males and 23(38.3%) females. The age range was 18 to 45 years. The most common age range in the study was 21 to 25 years (35%). Six (10%) patients presented with a dry socket. Eight patients (13.3%) presented with wound dehiscence, in primary closure. The Pain was more severe in primary closure as compared to secondary closure. The difference was statistically significant (p-value=0.002). Trismus was also more common in primary closure, the difference was statistically significant (p-value=0.003).

Conclusion: Pain and trismus was less severe in secondary closure as compared to primary closure

Keywords: Flap closure, impacted third molar, pain, primary closure, secondary closure, trismus.

Introduction

Surgical removal of third molars is a routine procedure in Oral and Maxillofacial units. The greatest incidence of impaction is seen with mandibular third molars, almost 33% of people with one impacted tooth.^{1,2} Factors responsible for third molar impaction are discrepancy between tooth size and skeleton, early sagittal growth of the mandible and unfavorable path of eruption if the tooth bud is mesially angulated.^{3,4} However, the post-operative complications with surgical removal are diverse, influenced by numerous general and local factors such as tooth positioning, the health status of a patient, age, use of medications and expertise of the oral surgeon.⁵ Frequently seen complication are pain, trismus, swelling, alveolar osteitis (dry socket), dysphagia, wound dehiscence, bleeding issues, delayed wound healing, infections and associated nerve injury.^{1,6,7}

In third molar surgeries, wound closure technique, a surgeon related factor, is linked with post-operative morbidity and is a controversial debate. The techniques employed directly the path of healing. Complete closure of extraction site, modification of flap designs, flap repositioning, sutureless wound approximation, inserting drains and use of dressings in the socket are among the few methods employed.⁸⁻¹¹ Closing the surgical wound by suturing mucoperiosteal flap over the bone is advantageous as healing takes place by the first intention but it hinders drainage resulting in inflammatory exudates and fluids accumulation. Hence increased post-operative pain and swelling are reported.^{4,9,12} On the other hand secondary closure involves removal of a mucosal wedge of reasonable size distal to the second molar or wound partially closed to make a self-irrigating opening promoting healing by secondary intention. Less post-operative swelling, pain, and trismus is reported but demands patient compliance.¹³⁻¹⁵

The study is aimed at comparing the post-operative complications such as pain and trismus with primary and secondary wound closure techniques after the surgical removal of the impacted mandibular third molar.

Materials and Methods

This randomized control trial was conducted at the Department of the Oral and Maxillofacial Surgery department at the Armed Forces Institute of Dentistry Rawalpindi after taking approval from the

institutional ethical committee. A total of 60 patients, 30 in each treatment group were included by the Consecutive (Non-probability) sampling technique. Patients with mesioangular impacted mandibular 3rd molars, of either gender with no associated systemic disease or drug allergies were included. Patients with acute pericoronitis, on certain medications hampering healing, pregnant, breastfeeding women, impacted molars with associated pathologies such as cysts, tumors were excluded.

Written informed consent was obtained and patients were randomly divided into two groups by lottery method. Demographic details (including name, age, gender, and contact number) were recorded on pre-designed proforma. Group 1 (control group) went under primary closure with flap repositioned and sutured hermetically with 3/0 silk. Group 2 (experimental group) underwent secondary closure with a wedge of mucosa 5-6mm removed distal to the second molar, flap repositioned, the sutured and triangular opening created distally. Pain assessment was done using visual analogue scale VAS and trismus calculated measuring inter incisal opening on the 7th post-operative day. Data was analysed using SPSS- 18. Descriptive statistics were employed for quantitative variables. Mean and standard deviation calculated. An independent sample t-test was used to compare mean pain and trismus between two groups. P-value ≤ 0.05 was considered significant.

Results

Out of 60 patients who underwent surgical extraction of mandibular third molars, 37(61.7%) were males and 23(38.3%) females.

The age range was 18 to 45 years. The most common age range in the study was 21 to 25 years (35%), followed by 31 to 35 years (18.33%), 26-30 years (16.66%), 36-40 years (10.02%) and 41-45 (6.66%).

Out of 60 patients only six (10%) presented with a dry socket in the 1st week after third molar extraction. Eight patients (13.3%) presented with wound dehiscence, reported only in primary closure cases.

The mean value of pain in primary closure (3.133) was greater as compared to patients with secondary closure (1.733) after third molar extraction. The difference in pain in the two groups was statistically significant (p-value=0.002). (Table 1)

Out of 30 patients of primary closure, eight (26.6%) reported with grade 4 pain. Seven patients (23.3%) of secondary closure presented with grade 5 pain. Females outnumbered the males as shown in Table 2.

Trismus was more common in primary closure, a mean value of trismus (7.863) was more than secondary closure (3.197). The difference was statistically significant (p-value=0.003) as shown in Table 3.

Table 1: Comparison of pain on 7th post-operative day by primary and secondary closure

Type of Closure	N	Mean	SD	SE	Independent Samples Test			95% CI	
					p-value	Mean Difference	Std. Error Difference	Lower	Upper
Primary Closure	30	3.1333	1.479	0.270	0.002	1.400	0.438	0.522	2.277
Secondary Closure	30	1.7333	1.892	0.345					

Table 2: Grades of pain after mandibular impaction removal by gender

Grades of Pain	Gender of Patient			
	Male		Female	
	Count	N %	Count	N %
0	12	20.0%	1	1.7%
1	8	13.3%	0	0.0%
2	6	10.0%	5	8.3%
3	4	6.7%	4	6.7%
4	4	6.7%	4	6.7%
5	3	5.0%	9	15.0%

Table 3: Comparison of trismus on 7th post-operative day by primary and secondary closure

Type of Closure	N	Mean	SD	SE	Independent Samples Test			95% CI	
					p-value	Mean Difference	Std. Error Difference	Lower	Upper
Primary Closure	30	7.863	7.173	1.30965	0.003	4.67367	0.438	1.70015	2.277
Secondary Closure	30	3.197	3.839	0.70104					

Discussion

Surgical extraction of third molars is a common procedure carried out in the Oral and Maxillofacial surgery department. Age is an important determinant of surgical difficulty. An increase in bone density with aging and root completion is related to a higher rate of complications over 25 years of age.¹⁶ Recovery after complications is also more prolonged and therefore the dentist recommends 3rd molar removals in young

adults.¹⁷ The age range of patients was 18 to 45 years, highlighting the fact that patients underwent third molar extractions due to complications e.g. pain, trismus or caries. The results were similar to various local and international studies.¹⁶⁻¹⁸

Dry socket or alveolar osteitis is a post-operative complication interrupting the healing process. The present study showed six (10%) out of 60 patients with a dry socket. However other studies reported a higher prevalence of 0.5 to 5%. This difference may be due to difficulty index of surgery or surgeon experience.^{4,19}

Wound dehiscence is reported in primary closure of third molar extraction due to tension. In the present study, it was seen in only 13.3% of the cases. However, Khande and his colleagues found wound dehiscence in 33.3% of primary closure.¹ Pasquiline et al also found this complication in more than 30% of the cases.³

Maria and her colleagues in their comparative study of primary and secondary closure of wound after third mandibular extraction showed that patients who underwent primary closure experienced significantly greater pain, swelling, and trismus as compared to secondary closure.¹⁴ The results were in accordance with the present study.

Another study conducted by Chaudhary and his coworkers also came up with similar results, in which pain and trismus was more pronounced in patients with primary closure as compared to secondary closure.²⁰

Pasqualini et al in their randomized control trial compared the results of primary and secondary closure techniques in 200 patients. In group 1 socket was closed by hermetically suturing the flap. However, in group 2, approximately 5mm wedge of mucosa adjacent to the second molar was removed obtaining secondary healing. Pain, wound dehiscence and swelling were statistically significant in group 1 which was in accordance to present study in terms of pain, whereas wound dehiscence was not so common in present study.³

Conclusion

The study suggests that secondary closure is the procedure of choice after removal of the impacted mandibular third molar, as it appears to minimize post-operative edema, pain and trismus enhancing patient comfort.

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