

**Comparative study between primary and secondary closure technique of surgical wound after third molar extraction.**

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**Conflicts of Interest:** Nil

**Abstract**

**Aim and Objective:** The purpose of the study is to assess and compare the primary and secondary wound closure technique after mandibular third molar extraction.

**Patients and Methods:** Sample size of 60 patients were taken in the study. All surgical extraction performed with Modified Ward’s incision. Patients were divided into two groups Group A and Group B, 30 patients in each group. In Group A, after surgical extraction of mandibular third molar, primary closure was done. This was achieved by 5 interrupted sutures. In Group B, after surgical extraction of mandibular third molar, secondary

closure was done. This was achieved by 3 interrupted sutures.

**Result:** Significant difference were noted in terms of pain, facial swelling, trismus and pocket depth which were less in patients with secondary closure.

**Conclusion:** From this study, we concluded that the secondary wound closure technique after surgical extraction of impacted mandibular third molar has significant advantages over primary wound closure.

**Keywords:** Third molar extraction, primary wound closure, secondary wound closure, pain.

**Introduction**

One of the daily minor surgical procedure in the department of Oral and maxillofacial surgery is the

removal of impacted mandibular third molar. Impacted third molar are found in 20 to 30% of population. <sup>1</sup>The greatest incidence of impaction is found in third molars. <sup>2</sup>

Common complications that occur during the surgical extraction of impacted mandibular third molar are trismus, pain, swelling, inferior alveolar nerve damage and compromised periodontal status of the second molar. <sup>3</sup> One of the factors mostly linked to intensity of post-operative pain and post operative swelling is type of healing of the surgical wound. <sup>4</sup> Primary and secondary closure technique is used for wound closure after extraction of impacted lower third molars. <sup>5</sup>

In primary healing, the socket is covered and sealed hermetically by a mucosal flap, whereas in secondary healing the socket remains in communication with the oral cavity. This type of wound closure allows the escape of inflammatory exudate from surgical site, thereby maintaining a self-irrigating opening. <sup>6</sup>

Some authors are in favour of primary closure whereas some authors reported more pain, swelling and trismus in primary closure and suggest secondary closure.

The purpose of the study is to assess and compare the primary and secondary wound closure techniques after removing impacted mandibular third molars.

### **Materials And Methods**

This Prospective study was conducted in the department of Oral and Maxillofacial Surgery, Indira Gandhi Govt. Dental College, Jammu. A sample size of 60 patients were taken in the study.

Patients were divided into two groups (Group A and Group B). 30 patients in each group. OPG radiograph was taken to assess third molar angulations to the long axis of second molar. Surgical extraction was done under local anesthesia, patients were given inferior alveolar nerve block and a long buccal nerve block.

Before surgery, all patients were given .2% chlorohexidine mouth rinse for 30 seconds. All surgical extraction performed with Modified Ward's incision.

In Group A, after surgical extraction of mandibular third molar, Primary closure was done, sealing off communication with oral cavity. This was achieved by 5 interrupted sutures, 1 each placed mesial and distal to the second molar, 1 across the socket. 1 distal to the socket and 1 across the relieving incision.

In Group B, after surgical extraction of mandibular third molar, secondary closure was done, leaving a window communication with the oral cavity. For this 3 interrupted suture were used, 1 each placed mesial and distal to second molar, 1 placed across relieving incision.

### **Inclusion Criteria**

1. Patients aged between 20-40 years who require mandibular third molar extraction.
2. Patients with the presence of a healthy second molar adjacent to the mandibular third molar.
3. Patients with good general health and good oral hygiene.
4. Medically fit patients.

### **Exclusion Criteria**

1. Patients with periocoronitis, periapical infection or lesions with respect to impacted mandibular third molar.
2. Root canal treated / periodontal weak mandibular second molars
3. Smokers, alcoholics and patients with uncontrolled/severe systemic disease.
4. Female patients on oral contraceptives, pregnant and lactating mothers.

### **Parameters**

1. Pain will be measured using Visual Analogue Scale (VAS). [SCORE-0 to 10]

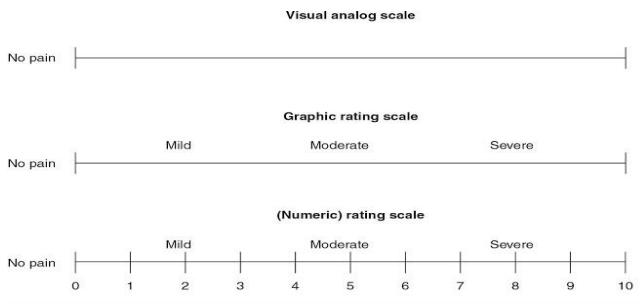


Fig. 1

2. The facial swelling will be recorded by a thread, which is transferred to a standardized scale. The horizontal facial measurement will be taken as distance from the corner of the mouth to the tragus of the ear. The vertical measurement will be taken as the distance from the outer canthus of the eye to the angle of the mandible by palpating the inferior border<sup>7</sup>.

$$\text{Facial measurement} = \frac{\text{Horizontal measurement} + \text{Vertical measurement}}{2}$$

3. Trismus – The maximal interincisal mouth opening will be recorded using calibrated scale as the distance between the upper and lower central incisors.
4. Distal Pocket- It will be measured as position of epithelial attachment below the Cementoenamel junction or the periodontal pocket depth on the distal aspect of the second molar. Probing measurements will be obtained from the free gingival margin to the bottom of the periodontal pocket using William probe<sup>3</sup>.

**Result**

On 2<sup>nd</sup> post operative day, the mean pain score in Group A was 4.47 with SD of 0.90 and mean pain score in Group B was 2.60 with SD of 0.62, showed a significant difference < 0.001. Similarly on 7<sup>th</sup> day, the mean pain score in Group A was 3.33 with SD of 0.76 and in Group B the mean pain score was 1.97 with SD of 0.32, showed a significant difference < 0.001. [ Table 1, Fig.2]

Table 1: Pain score on visual analog scale in two groups

VAS	Group A (PC)		Group B (SC)		P-value
	Mean	SD	Mean	SD	
Day 2	4.47	0.90	2.60	0.621	<0.001*
Day 7	3.33	0.76	1.97	0.320	<0.001*

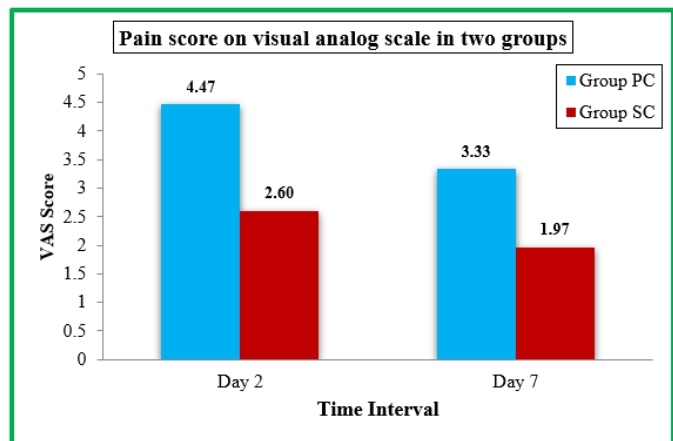


Fig. 2

On 2<sup>nd</sup> Post operative day, the mean facial swelling in Group A was 10.82 cm with SD of 0.40 and in Group B it was 10.82 cm with SD of 0.41 , showed a significant difference <.001. On 7<sup>th</sup> post operative day, the mean facial swelling in Group A was 11.10 cm with SD of 0.39 and in Group B it was 10.56 cm with SD of 0.43 and showed significant difference < .001.[Table 2, Fig.3]

Table 2: Facial measurement (cm) in two groups at various intervals of time

Time Interval	Group PC		Group SC		P-value
	Mean	SD	Mean	SD	
Preoperative	10.35	0.36	10.26	0.320	0.324
Day 2	11.64	0.40	10.82	0.411	<0.001*
Day 7	11.10	0.39	10.56	0.434	<0.001*

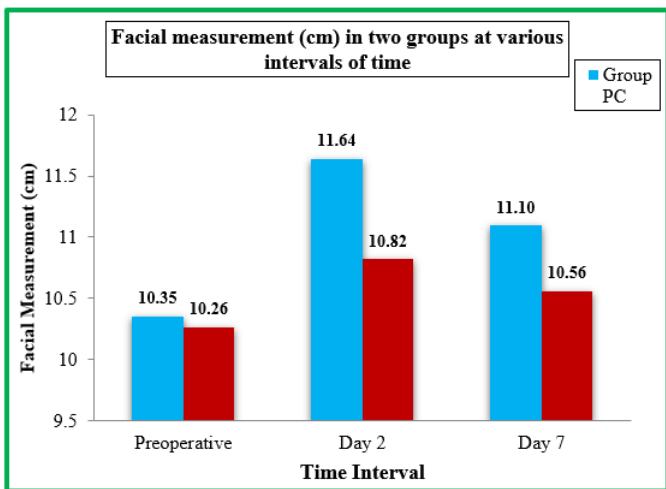


Fig. 3

On 2<sup>nd</sup> post operative day the mean mouth opening in Group A was 24.67mm with SD of 2.02 and in Group B it was 29.07mm with SD of 1.617, showed a significant difference of < .001. On 7<sup>th</sup> post operative day, the mean mouth opening in Group A was 31.70 mm with SD of 1.62 and in Group B it was 33.77 mm with SD of 1.77 showed a significant difference of < .001. [ Table 3, Fig. 4]

Time Interval	Group PC		Group SC		P-value
	Mean	SD	Mean	SD	
Preoperative	37.90	1.49	37.17	1.663	0.078
Day 2	24.67	2.02	29.07	1.617	<0.001*
Day 7	31.70	1.62	33.77	1.775	<0.001*

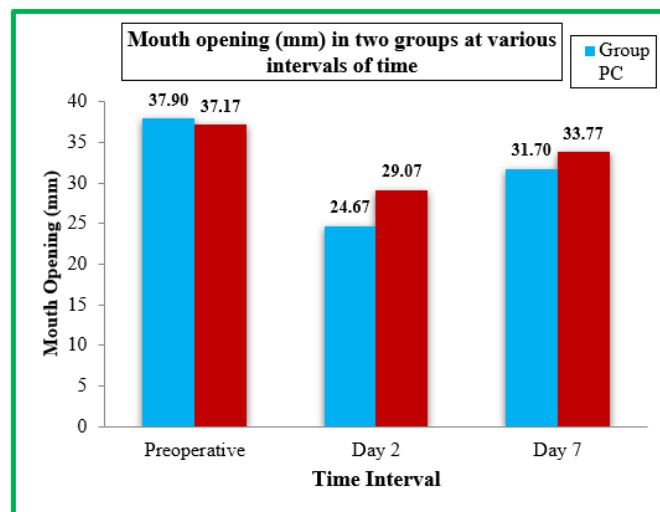


Fig. 4

On 2<sup>nd</sup> post operative day the mean pocket depth in Group A was 4.40mm with SD of 0.20 and in Group B, it was 3.82mm with SD of 0.09, showed a significant difference <.001. On 7<sup>th</sup> post operative day the mean pocket depth in Group A was 4.30 with SD of 0.211 and in Group B the mean pocket depth was 3.77mm with SD of 0.129, showed a significant difference <.001.[Table 4, Fig. 5]

Time Interval	Group PC		Group SC		P-value
	Mean	SD	Mean	SD	
Preoperative	4.46	5.39	3.31	0.144	0.246
Day 2	4.40	0.200	3.82	0.099	<0.001*
Day 7	4.30	0.211	3.77	0.129	<0.001*

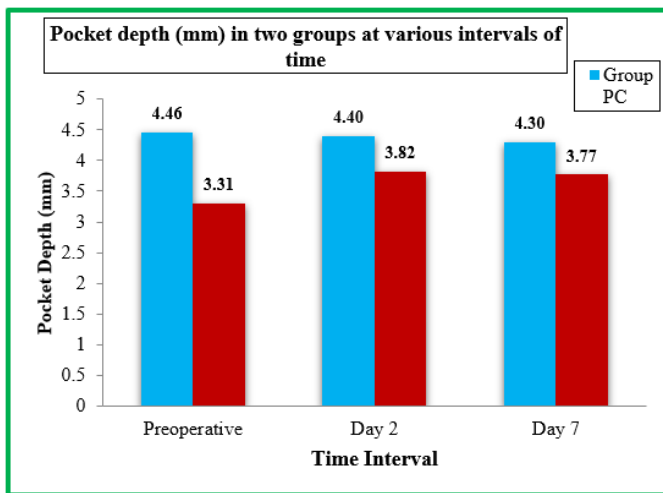


Fig. 5

### Discussion

Following surgical extraction of impacted mandibular third molar, complication that is more frequent and has significant impact on the patient's post operative quality of life is pain. The sensation of pain is subjective and depends on the individual's pain threshold and influenced by diverse factors including age, gender, anxiety and surgical difficulty. The VAS scale is considered as reliable and sensitive method for recording pain. In our study, on 2<sup>nd</sup> and 7<sup>th</sup> post operative day, the mean pain score was more in Group A (primary closure) than Group B (secondary closure) and statistical significant difference was found between the two groups [Table 1, Fig.2]. Similar results were seen in another study.<sup>8</sup>

Another complication that is associated following surgical removal of third molar is facial swelling. Factors that influence the incidence of facial swelling after third molar removal include patient age, gender, physique and oral hygiene. In our study, on 2<sup>nd</sup> and 7<sup>th</sup> post operative day, the mean facial swelling was more in Group A [ primary closure ] than Group B [ secondary closure] and statistical significant difference was found between the two groups [Table 2, Fig. 3]. Similar results were seen in another study.<sup>9</sup> To control post operative

inflammation, it is necessary to provide an adequate anti inflammatory therapy. Use of corticosteroids to limit the post operative edema has been advocated due to their inhibitory action.<sup>10,11</sup>

One more complication that is related to mandibular third molar surgery is trismus. Trismus is the most common and most frequent post operative sequelae of wisdom tooth removal. Trismus is the spasm of masticatory muscle of jaw. Like edema, trismus also reaches its peaks in two days and resolves on its own by the end of the first week. One of the factors that contributes to trismus is the elevation of flap beyond the external oblique ridge. In our study, on 2<sup>nd</sup> and 7<sup>th</sup> post operative day, the mean mouth opening was less in Group A [primary closure] than Group B [secondary closure] and statistical significant difference was found between the two groups [Table 3, Fig. 4 ]. The reduction of mouth opening resolves with in 7-10 days after surgical procedure with administration of antibiotics and analgesics<sup>12</sup>.

Similarly on 2<sup>nd</sup> and 7<sup>th</sup> post operative day, the mean pocket depth was more in Group A [primary closure] than Group B [secondary closure] and statistical significant difference was found between the two groups [Table 4, Fig.5].

### Conclusion

In our study, we observed significant reduction in pain, post operative swelling, trismus and pocket depth in patients with secondary closure.

From this, we can conclude that the secondary wound closure technique after impacted third molar surgical extraction has a significant advantage over primary wound closure.

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