

## ORIGINAL ARTICLE

# COMPARISON OF PAIN, SWELLING AND TRISMUS IN THE SURGICAL REMOVAL OF IMPACTED MANDIBULAR THIRD MOLARS BY FOLLOWING TWO DIFFERENT FLAP TECHNIQUES

Santosh B S<sup>1</sup>, Shivamurthy DM<sup>2</sup>, Shilpa IG<sup>3</sup>, Thippeswamy SH<sup>4</sup>, Johar Rajvinder Singh<sup>5</sup>, Sachin B Mangalekar<sup>6</sup>

<sup>1</sup>Reader, <sup>2</sup>Professor & HOD, Department of Oral and Maxillofacial Surgery, Chhattisgarh Dental College and Research Institute, Rajnandgaon, <sup>3</sup>PG Student, Department of Pedodontics, Maruti Dental college, Bangalore, <sup>4</sup>Professor & Head, Department of Oral Pathology, DIRDS, Faridkot, Punjab, <sup>5</sup>Reader, Department of Orthodontics, Chhattisgarh Dental College and Research Institute, Rajnandgaon, <sup>6</sup>Professor, Department of Pediatric Dentistry, professor, Bharati Vidyapeeth Dental College, Sangli

### ABSTRACT:

The surgical removal of an impacted mandibular third molar is considered as one of the most frequent minor procedures performed in oral and maxillofacial surgery. The purpose of this study is to clinically compare the post-operative sequelae such as pain, swelling and trismus following two different flap techniques in the surgical removal of impacted mandibular third molars. This study was conducted on 40 patients having bilateral impacted mandibular molars. The patients were then randomly allocated to any of the two groups. In 1st group each patient, the incision margins were joined and sutured, without closing the wound, on one side, seeking healing by second intention (Technique 1). On the contralateral side the flap was repositioned to allow healing by first intention (Technique 2). The Technique 1 proved more successful in preventing post-surgical sequelae of impacted third molar removal. Post-operative analysis showed increased amount of pain, swelling and trismus in group 2 as compare to group 1. The results of this study suggest that the healing by secondary intension after impacted lower third molar removal may have considerable contributions to reduce the post-operative swelling, pain and trismus.

Key words:- Mandibular third molar, Pain, Swelling, Trismus

Corresponding author: Dr. Santosh B S, Reader, Department of Oral and Maxillofacial Surgery, Chhattisgarh dental college and research institute, Rajnandgaon, E mail: drsantoshbs@gmail.com

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## INTRODUCTION

The surgical removal of an impacted mandibular third molar is a common procedure associated with various techniques and anecdotal opinion. The surgical objective in impacted mandibular third molar removal is to remove the tooth with minimal sequelae and complications.<sup>1</sup> Impacted third molar surgery is characterized by postoperative pain, swelling and trismus. These symptoms in turn depend on a number of factors such as the duration of the operation, the difficulty surgery, the magnitude of the osteotomy, the lack of oral hygiene, or the experience of the surgeon.<sup>2</sup>

Various methods have been suggested to prevent or control the postoperative sequelae following third molar surgery. These include modulating the time of surgery, the use of copious irrigation after surgery and the use of drains. There is however still a high frequency of undesirable sequelae after impacted mandibular third molar extractions.<sup>3</sup>

Regarding the use of flaps, different designs have been used to minimize periodontal damage in the case of second molars. The postoperative course is worse, the larger the raised mucoperiosteal flap, and there is some controversy over the use of wound healing by

first intention or partial closure (wound healing by second intention).<sup>4</sup>

The present study compares the manifestations such as pain, swelling and trismus in 40 patients, after surgical extractions 80 mandibular impacted third molar. In 40 cases primary closure of the wound was carried out by means of the Rehrmann sliding flap, while in the other 40 contralateral molars simple closure with healing by second intention was carried out.

## **MATERIAL AND METHODS**

The present study was carried out at Oral and Maxillofacial Surgery Department from Jan 2011 to March 2015. The study included forty patients with eighty impacted mandibular third molars. The following inclusion and exclusion criteria were used.

### **INCLUSION CRITERIA:**

1. Patients age ranged 18-40 years.
2. Patients with bilateral mandibular impacted molars.
3. Non-smokers.
4. Patients with no history of medical illness or taking any medication that could influence the surgical procedure or postoperative wound healing.

### **EXCLUSION CRITERIA:**

1. Pregnant patients.

The demographic data were recorded and informed consent was taken. A thorough history was taken. Patients were assessed clinically and were divided into two groups.

First group included 20 patients in which the conventional technique was used (simple approximation of the wound margins), healing by secondary intention. Second group included 20 patients in which the wound was sutured using a reflection flap (healing by first intention).

### **ASSESSMENT OF PAIN**

Postoperative pain was scored by means of a 10-cm visual analog scale (VAS). The patients were asked to explain their pain by 0 as no pain, 1-3 as mild pain, 4-6 as moderate pain, 7-8 as severe pain and 9-10 as very severe pain. Pain score was taken at 6 and 12 hours after the operation, and then once daily during the subsequent 6 days, the patients scored their pain on the VAS. The patients also recorded daily

analgesic use, in addition to the prescribed medication.

### **SUBJECTIVE ASSESSMENT OF SWELLING**

Subjective assessment of swelling was based on a 4-point scale.

1 = no swelling,

2 = mild swelling (intraoral swelling and edema of the operated zone),

3 = moderate swelling (intraoral and extraoral swelling and edema),

4 = severe swelling (intraoral, extraoral and facial swelling and edema).

Such swelling was measured by both the patient and one of the investigators.

Swelling was evaluated as follows: Four points on the patient's face were marked. The points were the middle points of the tragus, gonion of the soft tissue, angle of mouth and external cantus of the eyes. Three lines (tragus gonion, outer cantus-gonion, tragus-angle of mouth) were measured before and after each surgical operation. The differences between these dimensions showed the average amount of swelling. The measurements were made before the operation and again two and seven days after extraction, using a nonextensible measuring tape.

In all cases extraction of impacted mandibular third molar was carried out. In group 1, each patient, the incision margins were joined and sutured, without closing the wound, on one side, seeking healing by second intention (Technique 1). On the contralateral side the flap was repositioned to allow healing by first intention (Technique 2).

Following the operation, the patients were prescribed amoxicillin 500 mg/8 hours during 7 days, ibuprofen 600 mg/8 hours during 3 days. All patients were instructed to rinse with 0.12% chlorhexidine three times daily.

Results thus obtained were tabulated.

## **RESULTS**

The present study was conducted on 40 patients with 80 impacted mandibular third molars. Following results were obtained.

### **ASSESSMENT OF PAIN**

Visual Analogue Scale (VAS) was used for assessing pain. The patients were asked to explain their pain by 0 as no pain, 1-3 as mild pain, 4-6 as moderate pain, 7-8 as severe pain and 9-10 as very severe pain.

**Table I:** Subjective assessment of pain

Technique	6 hour	12 hour	1 day	2 day	3 day	4 day	5 day	6 day	7 day
<b>Conventional suturing (technique 1)</b>	6	6	5	4	4	3	2	2	1
<b>Flap repositioning (technique 2)</b>	8	7	6	6	6	5	5	4	3

**Table II:** Subjective assessment of swelling

Technique	1 day	2 day	3 day	4 day	5 day	6 day	7 day
<b>Conventional suturing (technique 1)</b>	3	2.5	2.5	2	2	1	1
<b>Flap repositioning (technique 2)</b>	4	3.5	3	2	2	1.5	1.5

**Table III:** Subjective assessment of trismus

Technique	1 day	2 day	3 day	4 day	5 day	6 day	7 day
<b>Conventional suturing (technique 1)</b>	35mm	37mm	40mm	42mm	45mm	47mm	47mm
<b>Flap repositioning (technique 2)</b>	30mm	32mm	35mm	40mm	42mm	44mm	45mm

The maximum postoperative pain was recorded after between 6 and 12 hours with both techniques. Although the mean pain was slightly greater with Technique 2, Mean analgesic use was similar with both techniques, though after 7 days the patients subjected to Technique 1 required less analgesia than those subjected to Technique 2 (Table I). Swelling as scored by the patient was greater after two days than after 7 days. With Technique 1, swelling was significantly less intense than with Technique 2 (Table II).

### TRISMUS

We measured distance from the incisal margin of the upper incisor to the incisal margin of the lower incisor, in order to assess postoperative trismus. The reduction in oral aperture was significantly greater after two days than after 7 days. Technique 1 showed significantly lesser trismus than Technique 2 (Table III).

### DISCUSSION

The surgical removal of an impacted mandibular third molar is considered as one of the most frequent

minor procedures performed in oral and maxillofacial surgery. Many studies have been done with regard to surgical technique, antibiotic therapy and post operative evaluation to assess patient comfort and wound healing, but still there exist a diverse opinion with third molar<sup>5</sup>. One such difference of opinion is regarding the technique of wound closure after removal of impacted mandibular third molar. Different incisions have been proposed in third molar surgery to offer a better surgical field and to minimize postoperative discomfort for the patient<sup>6</sup>. In 1936, Rehrmann<sup>7</sup> proposed a flap repositioning technique to secure healing by first intention after the extraction of lower third molars. With the purpose of securing primary closure of the wound, Jakse et al.<sup>8</sup> reported better results when using a sliding sutured triangular flap than when using a mucogingival flap. According to these authors, primary closure of the flap avoids suture dehiscence and improves wound healing. However, in the opinion of other investigators, healing by second intention, where wound drainage is facilitated, causes less patient

discomfort<sup>9</sup>. The measures of swelling and pain were recorded by means of a visual analog scale (VAS), which according to Berge is an effective measurement option<sup>10</sup>. In our study VAS score was low in technique 1, where simple approximation of wound was done as compare to technique 2 (Table I). Swelling was evaluated as follows: Four points on the patient's face were marked. The points were the middle points of the tragus, gonion of the soft tissue, angle of mouth and external cantus of the eyes. Three lines (tragus gonion, outer cantus-gonion, tragus-angle of mouth) were measured before and after each surgical operation. In our study swelling was considerably less intense in technique 1 (Table II). Dubois et al<sup>11</sup> performed the surgical removal of both lower molars. According to these authors, pain and swelling were greater when the surgical wound healed by first intention. Holland and Hindle<sup>12</sup> reported more pain and swelling in those cases where primary closure was carried out. However, after one month the surgical wound showed a better appearance in these patients than in those where closure and healing by second intention was carried out. Brabander and Cattaneo<sup>13</sup> observed no statistically significant differences in pain, swelling and trismus between two groups of patients subjected to primary flap closure using the conventional technique and to simple wound closure with healing by second intention. In our study we recorded greater trismus with technique 2. Some authors suggested primary closure of the flap, but keeping a drain in place during 72 hours. Study by Felix Nzube Chukwuneke<sup>14</sup>, S. Rakprasitkul<sup>15</sup> and Mohammad Zandi<sup>16</sup>, reported lowest average of mouth opening at 24 and 72 hours in the group showed trismus in which the drain was used for the distoangular position.

## CONCLUSION

Results of our study suggest that the healing by secondary intention after impacted lower third molar removal may have considerable contributions to reduce the post-operative swelling, pain and trismus.

## REFERENCES

1. Shepherd JP, Brickley M. Surgical removal of third molars. *Br Med J* 1994; 309: 620-21.
2. Garcia AG, Sampedro FG, Rey JG, Torreira MG. Trismus and Pain After Removal of Impacted Lower Third Molar. *J Oral Maxillofac Surg* 1997; 55: 1223-6.
3. Blair VP, Ivy RH: *Essentials of Oral Surgery*. St. Louis, CV Mosby Co, 1923.
4. Pasqualini D, Cocero N, Castella A, Mela L, Bracco P. Primary and secondary closure of the surgical wound after removal of impacted mandibular third molars: a comparative study. *Int J Oral Maxillofac Surg*. 2005 Jan; 34(1):52-7.
5. Ness, G.M. and Peterson, L.J. (2004) Impacted teeth. In: *Principles of Oral and Maxillofacial Surgery*, Vol. 1 (5th Ed.), WB Saunders Co, Philadelphia, London, Toronto, 250-311.
6. Alling CC 3rd, Catone GA. Management of impacted teeth. *J Oral Maxillofac Surg*. 1993 Jan;51(1 Suppl 1):3-6.
7. Rehrmann A. Eine methode zur SchlieBungvon Kieferhöhlenperforationen. *Dtsch Zahnärztl Wschr* 1936;39;1136-40.
8. Jakse N, Bankaoglu V, Wimmer G, Eskici A, Pertl C. Primary wound healing after lower third molar surgery: evaluation of 2 different flap designs. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2002 Jan;93(1):7-12.
9. Clauser C, Barone R. Effect of incision and flap reflection on postoperative pain after the removal of partially impacted mandibular third molars. *Quintessence Int*. 1994 Dec;25(12):845-9.
10. Berge TI. The use of a visual analogue scale in observer assessment of postoperative swelling subsequent to third-molar surgery. *Acta Odontol Scand*. 1989 Jun;47(3):167-74.
11. Dubois DD, Pizer ME, Chinnis RJ. Comparison of primary and secondary closure techniques after removal of impacted mandibular third molars. *J Oral Maxillofac Surg*. 1982 Oct;40(10):631-4.
12. Holland CS, Hindle MO. The influence of closure or dressing of third molar sockets on post-operative swelling and pain. *Br J Oral Maxillofac Surg*. 1984 Feb;22(1):65-71.
13. De Brabander EC, Cattaneo G. The effect of surgical drain together with a secondary closure technique on postoperative trismus, swelling and pain after mandibular third molar surgery. *Int J Oral Maxillofac Surg*. 1988 Apr;17(2):119-21.
14. Chukwuneke FN, Chima Oji, Saheeb DB. A comparative study of the effect of using a rubber drain on post operative discomfort following lower third molar surgery. *Int J Oral Maxillofac Surg* 2008; 37: 341-4.
15. Rakprasitkul S, Pairuchvej V. Mandibular third molar surgery with primary closure and tube drain. *Int J Oral Maxillofac Surg* 1997; 26: 187-90.
16. Zandi M. Comparison of corticosteroids and rubber drain for reduction of sequelae after third molar surgery. *Oral Maxillofac Surg* 2008; 12: 29-33.

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