



## RESEARCH ARTICLE

### HEALING BY PRIMARY INTENTION VERSUS HEALING BY SECONDARY INTENTION AFTER THIRD MOLAR SURGERY- A PROSPECTIVE CLINICAL TRIAL

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#### ABSTRACT

**Objectives:** To study and to compare the postoperative manifestations (pain, swelling and trismus) using two different techniques after 3<sup>rd</sup> molar surgery. **Material and methods:** Thirty healthy patients were subjected to surgical extraction of bilateral semi-impacted lower third molars, located in a similar clinical and radiographic position. In all cases, on one side, the flap will be repositioned to allow healing by first intention and on other side, incision margin will be just approximated, without closing the wound, seeking healing by secondary intention. Pain, swelling and trismus were evaluated at 1<sup>st</sup>, 3<sup>rd</sup> and 7 days. **Results:** There was lesser pain, swelling and trismus after extraction of a semi-impacted third molar when healing took place by second intention as compared to healing by first intention. **Conclusions:** The postoperative course proved worse when healing by first intention planned than on suturing by simple approximation of the wound margins.

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## INTRODUCTION

Impacted third molar surgical extraction causes postoperative pain, swelling and trismus which depends on certain factors such as angulation of third molars, mouth opening, pre-existing pericoronitis, intra-operative duration, amount of osteotomy, oral hygiene status, or the surgeons experience (Garcia Garcia et al., 1997; Capuzzi et al., 1994) to minimize such postoperative complications, different ways for closure of

wounds have been used to minimize periodontal changes distal to second molars (Peñarrocha et al., 2001; Groves, 1970; Nageshwar, 2002). In 1936, Rehrmann (1936) postulated a flap repositioning technique to attain healing by first intention (flap repositioning and margin-to-margin suturing) by which complete wound sealing was achieved, and thus contamination from the oral cavity was avoided. However, Flynn TR et al. (1983) suggested that primary closure of the wound prevents drainage of the inflammatory exudates, thereby increasing the

postoperative pain and the swelling. Cattaneo G and others (De Brabander, 1988; Rakprakitkul, 1997) recommended the possibility of leaving surgical drains in the region of the wound which leads to an improved postoperative course as compared to individuals subjected to primary closure. Recently Waite and Cherala (Waite, 2006) reported good results after 1280 surgical extractions of mandibular third molars when flap is passively repositioned without suturing. The present study compares the secondary postoperative manifestations (pain, swelling and trismus) recorded in 30 patients, after 60 third molar surgical extractions. Objectives of this study was to evaluate postoperative manifestations after surgical removal of third molar treated by approximating the wound margins to get tight seal (primary healing) (Jose *et al.*, 2008) and to evaluate postoperative manifestations after surgical removal of partially erupted impacted third molar treated by just approximating the wound margin (secondary healing) (Waite, 2006) and to compare the postoperative manifestations of both techniques.

## MATERIAL AND METHODS

A clinical prospective study was made on 30 healthy patients of age ranges from 18-35 years of age, seeking extraction of bilateral partially-impacted mandibular third molars (presenting similar surgical extraction difficulty). Informed consent was obtained from all the patients. Those patients having impaired oral hygiene, of above 35 years of age, fully impacted third molars along with imbalanced systemic profile like diabetes, hypertension, coagulopathy etc were excluded. Postoperative pain was assessed by means of a 10-cm visual analog scale (VAS) from zero (no pain) to 10 (worst pain imaginable) at 1<sup>st</sup> day, 3<sup>rd</sup> day and 7<sup>th</sup> postoperative days. Subjective assessment was made of swelling (on day- 1<sup>st</sup>, 3<sup>rd</sup> and 7<sup>th</sup> postextraction), 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), and 4 = severe swelling (intraoral, extraoral and facial swelling and edema). Such swelling was measured by both the patient and one of the investigators (SHB). In order to objectively evaluate swelling, two distances were measured: (a) from a point located at mandibular angle level and marked with marker, to the interincisal point, referred to as the angle - interincisal point distance (AID); and (b) from the tragus to the interincisal point, referred to as the tragus - interincisal point distance (TID). The measurements were made before the operation and again at one, three and seven days after extraction, using a non-extensible measuring tape. Before surgery, inter-incisor mouth opening was recorded to assess postoperative trismus.

**Surgical technique:** In all cases, 3<sup>rd</sup> molar extraction will be done under Local Anesthesia, involving raising of mucoperiosteal flap by vestibular releasing incision with minimal osteotomy and tooth sectioning if required. In all operated patients, on one side, the flap will be repositioned to allow healing by first intention using sutures and on other side, incision margin will be just approximated, without closing the wound with sutures, seeking healing by secondary intention. A one-month washout period was allowed to elapse between extraction on one side and extraction on the contra lateral side. Following the operation, the patients were prescribed amoxicillin 500 mg/8 hours during 5 days, ibuprofen 600 mg/8 hours during 3 days. All patients were instructed to perform three daily rinses with 0.12% chlorhexidine.

Statistical analysis was carried out using the SPSS (Statistical Package for the Social Sciences) version 15. The categorical variables of interest were correlated using the chi-square test, with mixed factorial analysis of variance (ANOVA) for studying the course of swelling, pain, trismus during follow-up visit.

## RESULTS

Thirty healthy patients between 18 and 35 years of age were studied where a total of partially-impacted 60 molars were removed. The mean surgical time was 5.2 minutes (range 4-25 minutes). The maximum postoperative pain, swelling, trismus was recorded at 1<sup>st</sup>, 3<sup>rd</sup>, 7<sup>th</sup> post-operative days with both techniques (Table 1,2,3)

**Table 1. Comparison of Mean pain at different time point between two technique**

Closure	Post operative period-pain assessment		
	1 <sup>st</sup> day	3 <sup>rd</sup> day	7 <sup>th</sup> day
Primary	5.6± 2.41	4.66± 2.12	2.33± 1.54
Secondary	4.06± 2.01	3.75± 2.08	1.2± 1.01
Repeated Measure ANOVA	Time : F=29.35 p<0.001,HS Time*Group : F=0.261 p=0.771, NS		

**Table 2. Comparison of Mean swelling at different time point between two technique**

	Time point-swelling		
	1 <sup>st</sup> day	3 <sup>rd</sup> day	7 <sup>th</sup> day
Primary	1.66± 0.72	1.26± 0.70	0.46± 0.63
Secondary	1.33± 0.61	0.93± 0.70	0.33 ±0.48
Repeated Measure ANOVA	Time : F=41.5 p<0.0001,HS Time*Group : F=0.447, p=0.612,NS		

**Table 3. Comparison of Mean trismus at different time point between two technique**

Closure	Post operative period-trismus		
	1 <sup>st</sup> day	3 <sup>rd</sup> day	7 <sup>th</sup> day
Primary	19.93± 4.72	26.6± 4.35	32± 4.61
Secondary	18.6± 3.43	27.4± 2.66	33.3± 1.95
Repeated Measure ANOVA	Time : F=290.07 p<0.001,HS Time*Group : F=3.191 p=0.049,S		

## DISCUSSION

Different flap designs had been proposed in third molar surgery to minimize postoperative discomfort to the patient (Alling, 1993). By securing the wound with sutures, better results are reported by Jakse *et al.* (2002) as primary closure of the flap avoids suture dehiscence and improves wound healing as the increased risk for the postoperative pain, edema, trismus. However, in the opinion of Clauser C *et al* and others healing by second intention facilitates wound drainage, causing less patient discomfort (De Brabander, 1988; Clauser, 1994). Using VAS (visual analog scale), measurement of pain is an effective (albeit subjective) measurement option. (16) In addition, swelling in our study was documented by an objective technique, approximately similar to the procedure as suggested by Pairuchvej V (Rakprakitkul, 1997). According to Dubois *et al.* (1982) and others, 19, 20 pain and swelling were greater when the surgical wound healed by first intention. However, at first one month follow-up, the surgical wound showed a better esthetic appearance when closure done with secondary intention.

In contrast, Suddhasthira et al. and others (De Brabander, 1988; Suddhasthira, 1991) reported no variation between these two types of wound healing clinically. Some authors (Rakprasitkul, 1997) prostaticulated the use of drain placement for first 72 hours postoperatively after primary closure of the flap, which drains out inflammatory fluids, thus reducing postoperative pain and swelling. Saglam (22) evaluated the postoperative sequelae of primary wound closure with and without drain placement, and reported lesser pain, swelling and trismus in the latter group which was found contrast to other studies (Rakprasitkul *et al.*, 1997).

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