Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology 26 (2014) 133–137

Contents lists available at ScienceDirect

Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology

journal homepage: www.elsevier.com/locate/jomsmp

Clinical Observation

# Comparative evaluation of primary and secondary closure after surgical removal of impacted mandibular third molar

Gaurav Singh [1], Amit Gaur [2], Madan Mishra *, Mahesh Chander [3], Jitender K. Aurora [4], Priya Gupta [5]

*Department of Oral and Maxillofacial Surgery, Sardar Patel Post Graduate Institute of Dental & Medical Sciences, Lucknow, Uttar Pradesh, India*

ARTICLE INFO

*Article history:*
Received 30 April 2013
Received in revised form 9 July 2013
Accepted 10 September 2013
Available online 28 October 2013

*Keywords:*
Primary closure
Secondary closure
Impacted mandibular third molar

ABSTRACT

This study was conducted to compare the efficacy of primary and secondary closure techniques after surgical removal of impacted mandibular third molar. A total of 200 patients (aged 17–30 years) were divided into two matched groups – Group I ($n = 100$), managed by repositioning of flap to obtain primary closure, Group II ($n = 100$), by removal of 6–7 mm wedge of mucosa adjacent to the second molar to obtain secondary closure. Comparison was done at postoperative days 1, 3, 7, 15 and 30 using Student "*t*"-test. Preoperatively, no significant difference was observed between two groups for pain score, swelling, and mouth opening. Mean pain score and mean swelling were significantly lower in Group II as compared to Group I while mean mouth opening was significantly higher in Group II as compared to Group I on postoperative day one. Comparable pain, swelling and mouth opening in both the groups were achieved on postoperative day 7 onwards. The results in present study favor the secondary closure of socket as it causes lesser postoperative swelling and pain as well as early improvement in mouth opening.



## 1. Introduction

Removal of impacted mandibular third molar is one of the most commonly performed procedures in oral and maxillofacial surgical practice. An impacted mandibular third molar is indicated for surgical extraction either as a prophylactic procedure or for pathologic transformation of hard and soft tissue. The post-operative period following surgical removal of mandibular third molar is frequently characterized by swelling and pain, sometimes quite severe, together with temporarily restricted mouth opening and masticatory inefficiency. Several studies were done in search of a way to reduce the post-operative complications. Flap design, osteotomy techniques, and use of tube drain in wound closure are few such examples [1]. One of the factors most closely linked to the intensity of postoperative pain and swelling is the type of healing of the surgical wound. A number of researchers have suggested that primary closure of the wound prevents drainage there by worsening the post-operative pain and the swelling [2–5]. Primary closure of third molar flap is derived from basic surgical principles and socket is covered and sealed hermetically by a mucosal flap. In secondary closure technique, socket remains in communication with the oral cavity to facilitate drainage of inflammatory products [3]. Over years, there have been different opinions regarding primary and secondary closure techniques. Some recent studies have suggested that secondary closure provides better surgical outcome as compared to primary closure in terms of post-operative pain and swelling as well as early recovery [3,6,7]. However, the evidence shown is preliminary in nature and needs further exploration. Hence the present comparative study was carried out to compare the post-operative sequelae after primary closure of flap as compared to repositioning of flap allowing secondary healing after third molar surgery.

## 2. Materials and methods

This prospective study included 200 patients (ASA grade I, age range between 17 and 30 years) of impacted mandibular third molars (mesioangular with mesial inclination between 25 and 45°,

☆ AsianAOMS: Asian Association of Oral and Maxillofacial Surgeons; ASOMP: Asian Society of Oral and Maxillofacial Pathology; JSOP: Japanese Society of Oral Pathology; JSOMS: Japanese Society of Oral and Maxillofacial Surgeons; JSOM: Japanese Society of Oral Medicine; JAMI: Japanese Academy of Maxillofacial Implants.

* Corresponding author. Tel.: +91 9565740127.
*E-mail addresses:* dr.gaurav1502@gmail.com (G. Singh), dr_amitgaur@yahoo.com (A. Gaur), mm.15mds@gmail.com (M. Mishra), brigmaheshchander@yahoo.co.in (C. Mahesh), jkaurora@rediffmail.com (J.K. Aurora), dr.priyagupta27@gmail.com (P. Gupta).
[1] Tel.: +91 9415086536.
[2] Tel.: +91 9415330300.
[3] Tel.: +91 9956984601.
[4] Tel.: +91 9336296021.
[5] Tel.: +91 9198128531.

2212-5558/$ – see front matter 
http://dx.doi.org/10.1016/j.ajoms.2013.09.001

class I, position A or B) attending the Out Patient Department of Oral and Maxillofacial Surgery in Sardar Patel Post Graduate Institute of Dental & Medical Sciences, Lucknow. The institutional ethical committee approved the study design, and informed consent was obtained from all the patients. All the patients included had totally or partially bony impacted mandibular molars with minimum preoperative mouth opening 30 mm. Medically compromised, smokers, those not willing to participate and those having inflammation in the oral cavity were excluded from the study. The selected patients were randomly divided in two groups (Group I and Group II), each containing 100 patients. In Group I, the flap was repositioned and primary closure was carried out by hermetically suturing the flaps whereas in Group II, a 6–7 mm wedge of mucosa adjacent to the second molar was removed to obtain secondary closure. Intraoral periapical X-ray or Orthopentomogram were used for pre-operative evaluation of impacted mandibular third molar. Routine blood investigations were done in all the patients prior to surgery.

### 2.1. Operative procedure

A standardized approach to the surgical removal of the impacted mandibular third molars was followed. Before the operative procedure all patients were given an oral rinse with 0.012% chlorhexidine for 1 min. Part preparation was done extra orally and intra orally with povidine iodine solution. Local anesthetia was achieved by giving inferior alveolar, lingual and long buccal nerve blocks using 2% lignocaine + adrenaline (1:80,000). After anesthesia Ward's incision was made to prepare a trapezoidal flap. After flap reflection, buccal and distal guttering was performed with as surgical bur on straight hand piece. The odontotomy was performed and tooth was elevated and removed from the socket. Curettage of the socket was performed. Abundant irrigation of the socket with sterile saline solution was done. In the patients of Group-I, the flap was repositioned and sutured hermetically using 3-0 black braided silk in interrupted pattern that allowed primary closure of the wound (Fig. 1).

In the patients of Group-II, a 6–7 mm wedge tissue distal to second molar was removed in such a way so as to leave an opening for the socket to communicate with the oral cavity. A suture was placed immediately distal to the 2nd molar and another on the posterior releasing incision using 3-0 black braided silk that allow healing by secondary intension of the wound (Fig. 2). The average duration of surgery (both the groups) from incision till suturing was between 25 and 35 min.

All the patients received postoperative instructions (Ice pack application on and off for 30 min on operated side for 8 h, soft and warm diet for first 24 h, normal oral hygiene maintenance 24 h after surgery, warm saline water gargles 24 h after the surgery for 7 days). All patients were given antibiotic (Cap. Amoxycillin 500 mg three times a day, for 5 days), anti-inflammatory (Tab. Diclofenac sodium 50 mg + Paracetamol 325 mg, three times a day, for three days) and multivitamin supplement for 5 days. The sutures were removed on 7th day postoperatively. Post-operative results were evaluated in terms of pain, swelling and mouth opening at postoperative days 1, 3, 7, 15 and 30. Pain was recorded on a 5 cm long visual analog scale, where 0 indicated no pain and 5 indicate the most severe and unbearable pain (Table 1). Swelling was measured as a distance between Tragus to Subnasale (Trag-Sn) and distance between Tragus to Pogonion (Trag-Pog). This distance was measured with a 3-0 silk suture following the contour of the soft tissue, and not stretching the suture thread. The measurement was transferred on a scale (measuring tape) and recorded in centimeters. Swelling was considered as the difference between preoperative measurements of Trag-Sn and Trag-Pog to post-operative measurements at the same points.

**Fig. 1.** Primary closure.

Mouth opening was measured (in cm) preoperatively and postoperatively, from the incisal edge of the upper incisor to the incisor edge of the lower incisor by means of a metallic scale.

The ability of surgeon might influence the outcome of the surgery. The operators involved in this study were judged to have

**Fig. 2.** Secondary closure.