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A Prospective Study to Assess the Surgical Outcomes with Suture-Less Mandibular Third Molar Surgery

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ABSTRACT

Background: The purpose of this study is to identify surgical outcomes in third molar surgery when no sutures are used for primary closure. **Methods**: A total of 50 third molars of either side were removed from 50 patients in an outpatient setting using local anesthesia. A standard Ward's incision is used in all cases and no sutures were placed over a 1 and ½ year period. Follow up was done on regular basis and protocol of 1st day, 3rd day and 7th day postoperatively. **Results**: In our study total 50 patients were taken out of which 27 were men (54%) and 23 were women (46%). The mean Total time of procedure was 29.88±8.35 min. Mean mouth opening preoperatively was 3.86±0.77 cms on 1st day 2.85±0.83 cms on 3rd day 3.25±0.73 cms and on 7th postoperative day it was 4.00±0.62 cms. Postoperative mean pain score on 1st day was 3.18±1.02, on 3rd day was 1.44±0.93 and on 7th day was 0.24±0.56 which is measured by VAS scale. Swelling was measured preoperatively, 1st day, 3rd day and 7th day respectively at three points. There was a significant (p-value≤0.05) difference between the various intervals. In the present study, a total of 3 patients (6%) came with complain of severe pain on 3rd postoperative day. On clinical examination, it was diagnosed as dry socket, which subsided after 1 week after the treatment with zinc oxide eugenol dressing along with analgesics. **Conclusion**: The results showed that pain, swelling and trismus were less with suture-less technique when we compared the results with the literature. Delayed healing in oral surgery is not new. The outcome of 50 extractions demonstrates good results.

Keywords: ?

INTRODUCTION

Impaction is defined as a cessation of the tooth eruption caused by a clinical or radiographically detectable physical barrier in the eruption path or by an ectopic position.[1] Third molars generally erupt between the ages of 18 and 24 years, although there is wide variation in eruption dates. Third molars are present in 90% of the population with 33% having atleast one impacted third molar.[2] In most of the situations; it results in recurrent pericoronitis, caries to adjacent tooth, cyst, etc. there by, surgical removal of third molar is one of the most frequently performed procedures in the dept. oral and maxillofacial surgery. Removal of third molar is associated with many postoperative complications such as pain, fever, swelling, trismus and wound infection.[3]

The postoperative period after surgical removal of mandibular third molars is frequently characterized by swelling and pain, at times quite severe, in addition to temporary restricted mouth opening. Most surgeons agree that the operative time, trauma, and difficulty are important factors in postoperative complications. One of the factors most closely linked to intensity of postoperative pain and swelling is the type of healing of the surgical wound.

Various methods to alleviate these complications have been the focus of several studies including modification of closure techniques with or without incorporation of drains, use of drugs such as analgesics, corticosteroids, and antibiotics, physical therapeutic methods such as cryotherapy and soft laser application. However, there is no ideal method that can minimize postoperative pain, swelling and trismus without unwanted side effects. Szmyd and Hester recommended open techniques and had reported less edema and reduced pain4. Suture-less third molar surgery in which no form of suture is used is fast gaining global attention. Wound margins are approximated in such a way that the flap is repositioned and allowed to passively fall into a natural position often leaving the socket slightly open.

The purpose of this prospective study is to report surgical outcomes of one surgeon's standard third

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molar procedure (a standard ward's incision, and no sutures at all to reposition the flap) and compare results to the existing literature. An attempt was made to evaluate routine or average outpatient surgery carried out in PDM Dental College and Research Institute, Bahadurgarh.

MATERIALS AND METHODS

The present study was conducted on 50 patients with age group 18-50 years, who reported to the Department of Oral and Maxillofacial Surgery, PDM Dental College and Research Institute, Bahadurgarh, Haryana, for impacted mandibular third molar surgery. The duration of this study was from Jan 2014- Sept 2015.

Method of Collection Data

50 patients between age group ranging 18-50 years, out of which females 29 and males 21 were in number, with impacted lower third molar. Panoramic radiographs or I.O.P.A. were taken to assess third molar eruption and angulations versus the adjacent second molar. Suture less surgery under local anesthesia was planned for these selected study subjects. All of the participants were informed of the possible risks and benefits of the procedure and signed a detailed informed consent form. The surgical procedure is performed by single operator.

Inclusion criteria:

Impacted mandibular third molars indicated for surgical extraction. Male or female patients with impacted 3rd molar in 3rd quadrant/4th quadrant between the age group of 18-50 years. Patient should be healthy and without any significant medical disease that may compromise healing. Absence of active infection, both pericoronal and periapical at the time of surgery. Participants who did not meet the criteria were excluded.

Surgical Protocol:

The patients enrolled in this study were prepared using standard aspetic methods and draped appropriately. Local anaesthesia (2% lignocaine with 1:80000 adrenalines) was achieved through classical inferior alveolar nerve block along with lingual and long buccal nerve blocks. Adequacy of anaesthesia was confirmed by subjective and objective symptoms.

A standard Wards incision with anterior and distal releasing incision was made with no. 15 surgical blade. Full thickness mucoperiosteal flap was reflected to expose the bone overlying the impacted tooth and care was taken to protect it with an Austin's retractor during the entire surgical procedure.

Bone was removed from the buccal and distal surfaces with S.S white surgical burs using straight handpiece mounted on a surgical micromotor under copious saline irrigation. The tooth was sectioned if deemed necessary to minimize the bone removal and delivered from the socket with elevators/ forceps atraumatically. Sharp bony margins were filed, socket was curetted and debrided with betadine and saline irrigation thoroughly. The flap was repositioned and allowed to passively fall into natural position leaving the socket slightly open. A sterile gauze was placed to obtund bleeding and stabilize the flap. Standard post-operative instructions were given. Patients were prescribed oral antibiotics and analgesics such as Cap Novamox LB 500mg 8 hourly; Tab Metrogyl 400 mg 8 hourly and Tab Ibugesic Plus, 8 hourly for minimum 5 days postoperatively.

Evaluation Procedure

The patients were evaluated by the same operator preoperatively and postoperatively and on the 1st, 3rd and 7th days after surgery. Pain was evaluated using a 10 cm visual analogue scale (VAS). Trismus was evaluated by measuring the distance between the mesial-incisal corners of the upper and lower right central incisors at maximum mouth opening in cm, preoperatively, and on the 1st ,3rd and 7th postoperative days, using Vernier calipers. The facial swelling measurment in cm was determined preoperatively and 1st , 3rd and 7th days postoperatively by measuring the distance from-

A. Most posterior point in the midline of tragus
B. Lateral canthus of eye
C. Most lateral point on the corner of mouth
D. Soft tissue pogonion (most prominent point on the midline of chin)
E. Most inferior point on angle of the mandible

RESULTS

Table 1: Statistical analysis for Winter's classification

Winter's classification	Frequency	Percent
Distoangular	14	28.0
Horizontal	6	12.0
Mesioangular	22	44.0
Vertical	8	16.0
Total	50	100.0

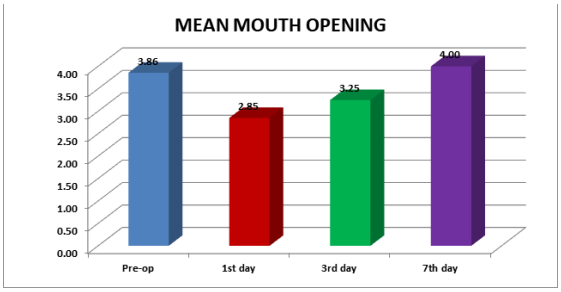

Figure 1:

A total of 50 subjects, taking in a single group, participated in the present study. Of the 50 subjects,

27 were men (54%) and 23 were women (46%). The statistical analysis was done for winter's classification [Table 1]. The mean Total time of procedure was 29.88±8.35 min;sec Statistical analysis were done on the 1st, 3rd and 7th day postoperatively to evaluate the efficacy of sutureless third molar surgery. Three clinical key parameters were studied they were, post-op pain, swelling and mouth opening.

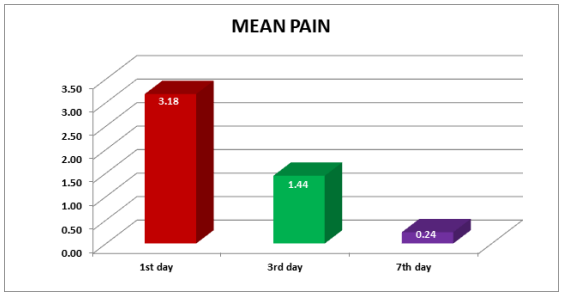

Figure 2:

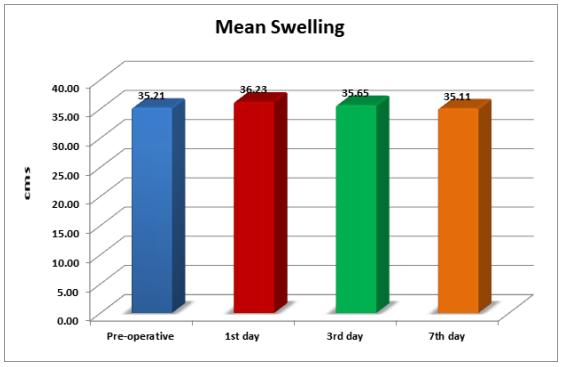

Figure 3:

Mean mouth opening preoperatively was 3.86±0.77 on 1st day 2.85±0.83 on 3rd day 3.25±0.73 and on 7th postoperative day it was 4.00±0.62.The comparison between mean MOUTH OPENING pre-operatively, at 1st day, 3rd day and 7th day was done using the One-way ANOVA test [Figure 1]. There was a significant (p-value≤0.05) difference between the various intervals. Postoperative mean pain score on 1st day was 3.18±1.02, on 3rd day was 1.44±0.93 and on 7th day was 0.24±0.56. The comparison between mean pain score at 1st day, 3rd day and 7th day was done using the One-way ANOVA test. There was a significant (p-value≤0.05) difference between the various intervals [Figure 2]. Swelling was measured preoperatively, 1st day, 3rd day and 7th day respectively at three points. Mean swelling from point A to point C on 1st day was 11.154±0.7675, on 3rd day was 10.992±0.7717 and on 7th day was 10.83±0.793. The comparison between mean AC pre-operatively, at 1st day, 3rd day and 7th day was done using the One-way ANOVA test. There was a significant (p-value≤0.05) difference between the various intervals. Mean swelling from point A to point D on 1st day was 15.19±0.75, on 3rd day was 14.95±0.78 and on 7th day it was 14.72±0.78. The comparison between mean AD pre-operatively, at 1st day, 3rd day and 7th day was done using the One-way ANOVA test. There was a significant (p-value≤0.05) difference between the various intervals. Mean swelling from point B to point E on 1st day was 9.88±0.70, on 3rd day was 9.71±0.71 and on 7th day it was 9.55±0.74. The comparison between mean BE pre-operatively, at 1st day, 3rd day and 7th day was done using the One-way ANOVA test. There was a significant (p-value≤0.05) difference between the various intervals. The mean swelling was [Figure 3].

DISCUSSION

The present study was done to evaluate the effect of suture-less (secondary closure) technique on postoperative pain, swelling and trismus after mandibular third molar surgery. Pain is a subjective experience that is influenced by many factors such as the patient's age, previous experience of pain, pain threshold and tolerance, therefore, assessment of pain may be difficult. Pain was evaluated with the VAS scale, which is considered to be an effective tool to evaluate clinical parameters that influence the subjective experience of an individual. In our study we adopted VAS scale to evaluate the post-operative pain.[5] A number of different techniques have been used to measure post-operative swelling like Calipers and Face Bows, Frontal photographs and radiographs, VAS method, Stereophotographic technique etc.[5] In our study, we used 5 points to measure the swelling that is most posterior point in the midline of tragus, lateral canthus of eye, most lateral point on the corner of mouth, soft tissue pogonion (most prominent point on the midline of chin), most inferior point on angle of the mandible. Swelling was determined by the craniometric method using flexible tape or by thread. Trismus was evaluated by measuring the distance between incisal edges of upper & lower central incisors or lateral incisor using Vernier's caliper or scale after 1st day, 3rd day and 7th day postoperatively.

The closure technique is an operative factor that has been linked to the intensity of postoperative pain, swelling, trismus, periodontal status of mandibular 2nd molar and infection. Primary closure is the complete reposition of the third molar flaps post-surgery using sutures such that healing is by primary intention, while in secondary closure the socket remains in communication with the oral cavity and healing there by, secondary intention. Dubois et al. equated primary closure with 'primary healing' while Holland and Hindle used the terms ' closed healing' (complete closure) and 'open healing' (partial closure) to refer to primary and secondary closure respectively. Pasqualini et al. described primary closure as complete closure or

primary healing and secondary closure as open healing or secondary healing.[6]

Different methods of achieving secondary closure have been described in published reports on closure techniques. These include creating a 'window' by excising the mucosa immediately distal to the second molar, incorporation of drains which may be in form of gauze or rubber, combining mucosa excision with use of drains, placing a single suture and the use of 'suture-less' technique where no form of suturing is done.[6-12]

A technique in which no form of suturing is done has been described by Waite and Cherala. The authors reported the outcome of surgical extraction of 1,280 impacted third molars in 366 patients without placement of sutures (secondary healing). They reported less pain because the technique allowed for open drainage of the extraction sockets. A suture-less technique have the advantages of reducing the operation time and less tissue manipulation with consequent reduction in the inflammatory response. The technique might however be limited to cases in which minimal incisions are used for third molar surgery.[4,6]

Time plays a vital role in any surgical procedure. A surgical procedure however simple, if requires longer time, creates a negative impact on the psychological status of the patient. The traditional standard incision used for impacted mandibular third molar has its own disadvantage in respect of time.

Anderson,[1] and Geofry L Howe,[2] described that more the time elapsed in surgical procedure, resulted in more complications. O.D. Osunde et al3, in their study explained that, because of small incision and non-requirement of suturing, time for total surgical procedure was much less than those where suturing was done. In the our study, the time taken in complete procedure for lower impacted third molar removal was measured for suture-less technique. According to the data, it is evident that the mean time taken was 29.88±8.35 min. The data from various studies is in agreement with the present study which suggests that the time taken for complete procedure for LITM removal in conventional suturing technique is considerably higher than the time taken for complete procedure for LITM removal in suture-less technique.[3,13]

The extent of the severity of pain was the chief indicator of patient comfort during the postoperative period after LITM removal.[7]

The study conducted by O.D Osunde et al,[3] found that pain was less in suture less technique than that of primary closure at the 24h, 48h, and 1week postoperative reviews ($p<0.05$). The other studies, by Peter D. Waite4, D. Pasqualini,[7] Jose M. Sanchis Bielsa,[8] AK Danda,[14] Hamid Mahmood Hashemi,[11] and Peter E. Egbor,[15] have the same result i.e intensity of pain was less in suture-less technique.

In our study the overall trend was reduction in severity of pain from the 1st (mean=3.18, std= 1.02), 3rd (mean=1.44, std=0.93) and 7th (mean=0.24, std=0.56) postoperative days for suture-less technique, which was also statistically very highly significant ($p \leq 0.05$). Our results correlated with these authors.

The second most common sequelae of removal of lower impacted third molar was swelling. In the studies of O.D Osunde,[3,6] Peter D. Waite4, D. Pasqualini,[7] G. Szolnoky,[16] and Jose M. Sanchis Bielsa8, they found that in suture-less technique there is free flow of inflammatory exudates from the extraction socket with consequent reduction in the degree of swelling. These variables have been thought to be a direct and immediate consequences of the inflammatory response associated with the surgical procedure. In conventional suturing the inflammatory exudates were not able to escape, while that was possible in suture-less technique or if the wound is closed with a window or drain.[6,9-11,14,15,17-21]

In our study, the trend of swelling was similar to as quoted in literature. The swelling increased from 1st day (mean AC- 11.154, AD-15.19, BE- 9.88 std. deviation AC-0.7675, AD-0.75, BE-0.70) to 3rd day (mean AC-10.992, AD-14.95,BE-9.71 std. deviation AC-0.7717, AD-0.78, BE-0.71) postoperatively and then subsequently decreased on 7th postoperative day (mean AC-10.83, AD-14.72, BE-9.55 std. deviation AC-0.793, AD-0.78, BE-0.74), which was statistically significant ($p< 0.05$)

The surgery is usually performed in close proximity to masseter muscle leading to inflammation of muscle and trismus. Trismus has never been affected by different types of flaps or surgical procedures.[19] From the study of Anisha Maria,[10] E.O. Anighroro,[12] and Peter E. Egbor,[15] it was seen that the trend of reduction of mouth opening was from 1st post-operative day to 3rd post-operative day. It was improved on 7th day and much better on 15th day after surgery. G. Szolnoksy,[16] Jose M. Sanchis Bielsa8 and Dr. Jabbar Jasim Kareem,[17] found that reduction of mouth opening was less affected in sutureless technique and recovered early than that of primary closure technique. In our study of sutureless technique it was evident that mouth opening on 1st postoperative day (mean-2.85, std-0.83) to 3rd postoperative day (mean-3.25, std-0.73) decreased while on 7th postoperative day (mean-4.00, std-0.62) it increased, which was statistically significant ($p<0.05$).

Kuang-Yao Peng et al,[22] have recognized that periodontal status was compromised, especially at the distal aspect of the preceding second molar, as a result of third molar extraction. However, the extent of periodontal effects was sometimes severe enough to prompt the development of special techniques to manage the resultant defects. From

the study of Peter D. Waite et al,[4] it is evident that the flap design and suture technique even with an exposed area distal to the second molar did not result in a periodontal defect if properly carried out. This is an important point because in the suture-less flap technique attached gingival is not pulled up tightly behind the second molar.

In every surgical procedure there is a chance of infection. In oral cavity chance of infection increased with many folds. Though asepsis, sterilization and infection control are the basis of any surgical procedure, and also this is the era of better antibiotics, because of which infection chances are least, but they may occur. In the present study, a total of 3 patients (6%) came with complain of severe pain on 3rd postoperative day. On clinical examination, it was diagnosed as dry socket, which subsided after 1week after the treatment with zinc oxide eugenol dressing along with analgesics. Apart from this no other postoperative complication was reported amongst the 50 patients selected for the study.

The results showed that pain, swelling and trismus were less with suture-less technique when we compared the results with the literature. The findings of our study suggested that the procedure of choice after removal of impacted mandibular third molar is a secondary closure and healing by secondary intention. A secondary closure appears to minimize immediate postoperative edema, pain and trismus which contribute to enhanced patients comfort5.

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