Original Article

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Pain and quality of life related to suture removal after 3 or 7 days at the extraction sites of impacted lower third molars

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Background: This study aimed to evaluate the patient's pain and quality of life after suture removal at either 3 or 7 days following the bilateral surgical extraction of impacted lower third molars.
Methods: This study was a prospective, randomized controlled clinical trial carried out in 30 patients, who acted as their own control. Each patient required the bilaterally impacted mandibular third molars to be extracted. The impacted teeth were removed and the wound margins were approximated and sutured with black braided silk. The suture material was removed on day 3 on one side and on day 7 on the other. Each participant was asked to complete a questionnaire after the removal of the suture material on each designated day.
Results: Regarding overall clinical symptoms, the mean VAS scores of male and female participants on day 3 were not significantly different from those on day 7. A significant difference was found in female participants, in that overall daily activity was better on day 7. There were significant differences in the ability to smile and laugh in both sexes and the ability to chew in the male participants was better on day 7.
Conclusions: There were no significant differences in the patient's pain and quality of life between suture removal on day 3 or on day 7 following surgery to remove impacted lower third molars.

Keywords: Pain; Patient satisfaction; Quality of life; Suture technique; Third molar; Trismus.

INTRODUCTION

The extraction of an impacted mandibular third molar is a common oral surgical procedure [1]. Black braided silk is usually chosen as the preferred suture material to approximate wound margins following a surgical operation owing to its ease of manipulation, reduced irritation, and knot security [2]. Suturing has benefits not only in controlling hemorrhage but also in promoting primary wound healing [3]. However, suture contamination can occur because of moist oral conditions, and it is also susceptible to infection by saliva and microorganisms that can jeopardize optimal wound healing [4,5]. A contaminated suture is likely to cause a constant acute inflammatory response [6], which can consequently provoke pain, trismus, and swelling [7]. The occurrence of such irritating symptoms often dissatisfy patients and hinder a successful clinical outcome [8]. Accordingly, many clinicians have emphasized the necessity for

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improved pain, swelling, and trismus control in patients who undergo third molar surgery [9,10]. These, in turn, can improve the patient's quality of life during the course of treatment and healing [11]. Moreover, emotional and psychological factors play an important role in surgical outcomes. A patient's satisfaction with the treatment might ensure favorable results and greater patient compliance.

On day 7 following suture placement, in addition to inadequate tension in the suture to result in wound apposition, numerous inflammatory cell infiltrations were observed in the black braided silk suture material [4]. Since the routine schedule for suture removal is 7 to 10 days after the operation, there is a risk of post-surgical complications, especially in high risk or medically compromised patients. Accordingly, the removal of the suture material as soon as possible is indicated. On the third day after surgery, the formation of a perisutural epithelial sheath was observed in the perisutural connective tissue without any inflammatory cell infiltrate, which can benefit wound healing [4].

Owing to a scarcity of evidence, it is difficult to determine the appropriate day for suture material removal after extraction of lower third molars. This study aimed to evaluate the pain perception of patients and their perceived quality of life when the suture materials were removed on day 3 versus day 7 after surgery.

MATERIALS AND METHODS

The research protocol and informed consent form were reviewed and approved by Mahidol University Institutional Review Board (MU-IRB). The study was carried out at the Advanced General Dentistry Clinic and Oral and Maxillofacial Surgery Clinic, Faculty of Dentistry, Mahidol University, Thailand.

This study was a prospective randomized controlled clinical trial carried out in 30 patients, who acted as their own control. After history taking, clinical examination, and radiographs, the participants were selected based on the following inclusion criteria:

(1) The mandibular third molars on both sides were fairly similar in terms of angulation and degree of impaction, and therefore of estimated difficulty for removal.
(2) Age ranged between 17-30 years
(3) No concomitant systemic disease (s)
(4) No history of an allergic reaction to 4% articaine and/or epinephrine.

Prior to the trial, each patient was informed about the study, its aims, implications, and possible complications. Signed informed consent was obtained.

The exclusion criteria were as follows:

(1) Participants who did not have the suture material removed on day 3 and day 7 respectively after the surgical removal of their lower third molars.
(2) Participants who did not return the questionnaires

Table 1. Questions asked to verify VAS score of each parameter

Parameter	Questions asked
Cheek swelling	Do you feel any swelling in your cheeks or do you have bruised cheeks?
Bleeding from the socket	Describe the level of bleeding or oozing from the extraction site?
Food impaction	How much food debris lodges at the extraction site?
Trismus	How difficult is it to open your mouth?
Irritating symptoms	How irritating is the extraction site?
Overall symptoms	What are your feelings concerning the overall post-surgical symptoms?
Eating	How difficult is it to eat normally?
Chewing	How difficult is it to chew food normally?
Talking	How difficult is it to speak normally?
Smiling or laughing	How difficult is it to smile or laugh openly?
Activities of daily living	In regards to the extraction site, how difficult is it to live normally or carry out daily activities?

to the surgeon.

The surgery was performed under local anesthesia. All participants were operated on by one surgeon (K.W.), who used a standard operating technique for the surgical removal of impacted mandibular third molars. After tooth removal, the surgical field was meticulously rinsed with sterile 0.9% saline. The extractions sites were closed by the interrupted suturing method with a black braided silk material. The sites of each participant were randomized for suture removal at two different times, on day 3 and on day 7 after the operation.

The participants were asked on day 4 (or after suture removal on day 3) following the operation to respond to a questionnaire concerning pain and quality of life, using a VAS score (1-10) (Table 1). On day 8 (or after suture removal on day 7), a second questionnaire was given to each participant to complete, asking them to assign a VAS score (1-10) to the same aspects of pain and quality of life as in the previous questionnaire.

Data management

The data were tabulated on an Excel spreadsheet and analyzed using a commercially available statistical software package (SPSS® 17.0, SPSS® Inc.).

Table 2. Mean and SD of VAS scores

Symptom	Day 3		Day 7		P-value
	QL (VAS) score	SD	QL (VAS) score	SD	
Pain					
Male	4.18	2.56	1.91	1.92	0.007*
Female	3.11	3.23	2.00	3.33	0.016*
Cheek swelling					
Male	3.36	3.14	1.73	2.37	0.053
Female	3.11	3.37	1.37	2.43	0.011*
Bleeding from socket					
Male	3.36	2.98	1.45	2.38	0.012*
Female	1.84	2.63	0.84	1.34	0.040*
Food impaction					
Male	6.00	2.53	5.55	2.91	0.410
Female	2.84	2.43	3.21	2.82	0.380
Trismus					
Male	3.64	3.41	1.82	2.79	0.026*
Female	2.89	2.75	1.58	2.39	0.005*
Irritation					
Male	4.18	2.86	2.91	2.07	0.109
Female	2.68	3.06	1.68	2.45	0.097
Overall symptoms					
Male	3.27	2.28	2.73	1.42	0.176
Female	1.89	1.88	1.42	1.95	0.192
Eating					
Male	5.82	2.44	6.27	2.69	0.204
Female	5.53	2.99	7.11	3.28	0.070
Chewing					
Male	5.09	2.43	6.82	1.99	0.008*
Female	5.00	3.18	6.63	3.56	0.066
Talking					
Male	7.18	2.71	8.64	1.69	0.100
Female	7.68	2.93	8.68	2.24	0.080
Smiling or laughing					
Male	6.00	2.53	8.36	1.86	0.006*
Female	7.11	2.87	8.74	1.73	0.003*
Daily activities					
Male	3.18	2.40	2.36	1.86	0.204
Female	2.37	2.27	1.37	2.17	0.032*

*Significant difference ($P < 0.05$)

RESULTS

All the enrolled participants completed their questionnaires. Among the participants, 36.7% were male and 63.3% female, with a mean age of 20 years.

Table 2 shows the mean and standard deviation (SD) of the VAS scores concerning pain and quality of life as well as clinical symptoms.

The mean VAS score for each separate category of clinical symptom (pain, cheek swelling, bleeding from the socket, food impaction, and trismus) was less than 5, except for food impaction among male participants, who reported a score of more than 5 both on day 3 and on day 7. Regarding overall symptoms, the mean VAS score on day 3, 3.27 for male and 1.89 for female participants, was not significantly different from that on day 7 when each sex is taken separately. There were significant differences ($P < 0.05$) in the VAS scores for overall symptoms between the sexes.

The mean VAS score was more than 5 in all categories related to functional satisfaction (eating, chewing, talking, smile, and laughing). In contrast to the clinical symptoms, the mean VAS score for function on day 7 was higher than that on day 3. Both male and female participants demonstrated significant differences ($P < 0.05$) in the VAS score for smiling/laughing alone between day 7 and day 3. The mean VAS score concerning daily activities on day 7 was lower than that on day 3, with a significant difference ($P < 0.05$) only in female participants.

DISCUSSION

The development of an incisional wound infection is a serious complication that can occur in patients who have undergone oral surgery, such as tooth extraction. Surgical infections may not only retard the normal healing process but can also induce life-threatening complications, particularly in patients suffering from chronic illnesses. Approximation of wound margins with silk is a commonly employed procedure in oral surgery. Although it is cheap and easy to use, its non-absorbable and braided nature allows the accumulation of surface debris and bacteria, resulting in inflammation of the surrounding wound [5]. Furthermore, the retained suture material may provoke symptoms of irritation in the patients.

Patient satisfaction improves the relationship between the clinician and the patient as well as the perceived quality of the provided treatment. Clinicians should also focus on the patient's satisfaction rather than solely concentrating on the objective success of the treatment [11]. Suture materials have the potential to delay wound healing and might cause the patient to feel uncomfortable. Therefore, suture materials should be removed as soon as possible as long as this does not compromise the normal wound healing process.

This study showed that there was no significant difference in the reported overall patient satisfaction regarding clinical symptoms between removal of the suture on day 3 and on day 7. Both sexes reported more pain, bleeding from the socket, and trismus on day 3 than on day 7 ($P < 0.05$). This was expected, since pain usually begins after the anesthesia wears off and reaches peak levels 6 to 12 h postoperatively [12,13], following which it declines between days 1 to 5 post-surgery [14]. On day 3, the mean VAS scores for both pain and quality of life differed between the male and female participants; this observation reflects the findings of other research that females experience pain differently from male participants [15]. Concomitantly, swelling and trismus tended to subside with time and showed a more favorable reported outcome on day 7 than on day 3.

Food impaction seemed to be the main reported problem in male participants, with an average VAS score greater than 5. The difference in tooth size, the degree of periodontal disease around the surgical wound, tooth alignment, or the differences in oral anatomy (e.g. the vestibular depth) between men and women might all be possible explanations of this phenomenon. Another possibility might be the patients' eating behavior, since men may be less careful than women in following the

recommendations for food consumption after the surgery. Any or all of these might explain why male patients reported more irritating clinical symptoms related to food impaction.

The results showed that the retention of silk sutures at the surgical sites did not compromise the patient's functional satisfaction (eating, chewing, talking and smiling, or laughing) since the VAS score of these functions were more than 5. Moreover, the participants seemed to function better on day 7. These results correspond with those a previous study which reported that the median number of days required to return to daily activity after third molar surgery was 3 days with recovery for chewing and return to regular diet taking 5 or 7 days, respectively [16].

With regard to the healing of the surgical wound in both sexes, less inflammation was observed on day 3 than on day 7. This was in accordance with a study which reported that numerous inflammatory cells had infiltrated into the black braided silk on day 7, while no infiltrated inflammatory cells were observed on day 3 [4]. Furthermore, during the 1-month follow-up examination after the extraction, we found no difference in the long-term outcome of wound healing.

In conclusion, the retention of braided silk suture at the surgical site did not have any significant effect on the patient's pain and quality of life.

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