Sore Throat Patients After Oral And Maxillofacial Surgery with and without Pharyngeal Pack

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Abstract

Background: Pharyngeal packing is now widely used in head and neck surgeries after induction of anesthesia. Therefore, the present study was designed to investigate the effect of pharyngeal packing on the occurrence of sore throat and other associated symptoms in comparison with patients without pharyngeal pack in orthognathic surgeries.

Methods: This study was a randomized clinical trial and the target population was patients undergoing maxillofacial surgery hospitalized in two centers, Shafa and Shahid Bahonar Hospitals in Kerman. Sixty patients assigned to two groups, including the group with saline-soaked pack and the group without pharyngeal pack, were evaluated for the severity of sore throat at time intervals of 2, 6, 12 and 24 hours after surgery as well as the occurrence of comorbid symptoms.

Results: There was no significant difference between the two groups in terms of demographic indicators, length of surgery and length of recovery. The severity of sore throat at all-time intervals was significantly higher in the pharyngeal pack group in comparison to the control group. Other symptoms such as dysphagia, hoarseness, nausea and vomiting, laryngeal spasm and cough were not significantly different between the two groups.

Conclusions: The findings of the present study showed that the use of pharyngeal was associated with an increase in the severity of sore throat but had no effect on the associated symptoms. These findings can be a guide to adopt the correct approach to the use of pharyngeal packs in patients undergoing maxillofacial surgery.

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Introduction

Nowadays, pharyngeal pack is commonly used after induction of anesthesia in maxillofacial, dental, ear, nose, throat and upper airway surgeries [1, 2].

The pharyngeal pack mainly consists of layers of gas soaked in liquid, which acts as a physical barrier to prevent the aspiration of blood, secretions, and debris into the esophagus, stomach, and respiratory tract. It also keeps the airway clean [3]. Some reports have also considered the use of throat packs to be beneficial in preventing gas leakage from around the tracheal tube during general anesthesia and on the other hand, pharyngeal packs have been considered useful in fixing and preventing displacement of the implanted artificial airway [3, 4].

Despite the routine use of throat packs in head and neck surgeries, there is still not enough evidence regarding their effectiveness, but on the other hand, some sources have considered the use of throat packs with negative consequences. For example, some researchers in studies have linked the use of a throat pack with an increased risk of sore throat and other symptoms after surgery, damage to the adjacent mucosa during the placement of the pack, and the retention and retention of the pack. Therefore, various methods have been used to prevent this event of pack retention over the years; Keeping a part of the pack hanging from the mouth so that it can be seen, tying or suturing it to the tracheal tube, The use of reminder stickers, the use of special packs that can be seen later through radiography, are among these methods [5-8].

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Some studies have related the use of throat pack to the increase in the severity of sore throat after surgery [9]. In general, sore throat is one of the common and unpleasant complications of anesthesia, which often occurs after the insertion and removal of tracheal tubes in patients [10]. Sore throat can be caused by damage to the mucous membrane of the pharynx, supraglottis, larynx and trachea, which depends on the contact pressure of the laryngoscope blade with the wall of the pharynx and epiglottis, the size of the tracheal tube, frequency of laryngoscopy, inhalation of dry inhaled gases, use of cholinergic drugs and the use of oral-pharyngeal airways [11]. The incidence of sore throat after tracheal intubation has been reported between 6.6% and 90%, with an average of 40% to 60%, and between 6% and 22% in short-term intubation and mask [12].

Factors that affect the prevalence of sore throat include the contact surface of the trachea and cuff (tracheitis), the use of lidocaine ointment and the size of the tracheal tube (laryngitis) and the use of succinylcholine (pharyngitis) [13-15]. Some reports indicate that dysphagia and difficulty in swallowing liquids, food, and drugs after surgery may be caused by the caliber of the endotracheal tube, cuff pressure, duration of surgery, difficulty in intubation, and the presence or absence of muscle contraction during be intubated [16]. However, some reports have also considered these symptoms to be related to the use of throat packs [9, 17]. Therefore, it seems that the use of throat packs, in addition to the possibility of damage to the mucous membrane of the adjacent area and causing sore throat, causes symptoms such as disturbances in Swallowing and hoarseness are also effective.

Nausea and vomiting **a**fter surgery is one of the common and annoying complaints of patients after surgical procedures under general anesthesia, which increases the feeling of discomfort after surgery and decreases the patient's satisfaction with surgery. And in some cases, it can cause dehydration, electrolyte disturbances, aspiration of stomach contents or even bleeding [18, 19]. The Average incidence of nausea and vomiting after surgery and general anesthesia is estimated at 36% [18]. In jaw surgeries, this rate has been reported from 40% in surgery on one jaw to 56% in surgery on two jaws [19]. One of the reasons that has been considered effective in the occurrence of nausea and vomiting after surgery in head and neck surgery is the ingestion and aspiration of blood and secretions during surgery into the digestive tract and stomach [20, 21].

Few studies have considered throat pack as a factor to reduce nausea and vomiting after surgery because it acts as a physical barrier and prevents blood from entering the stomach and stimulating the digestive tract, Although the results of different studies are inconsistent in this regard, so that several reports have not found a difference between nausea and vomiting after surgery and the use of a pack [9].

Summary and the necessity of carrying out the plan

Due to the complications of using throat packs and the associated risks, some researchers have recommended not to use throat packs in general [3, 22]. Some clinical studies regarding the effectiveness of throat packs in various surgeries have shown little evidence regarding the benefits of these packs. Although the use of pharyngeal packs is common in surgeries, it seems that there are few studies on the effectiveness and rationality of their use, and the results of the existing studies are not compatible with each other. Therefore, more studies are needed to determine the effectiveness of using a throat pack, especially in the clinical outcomes of patients, such as the occurrence of sore throat and symptoms such as dysphagia, harshness of voice, nausea and vomiting after surgery. Therefore, the present study was designed with the aim of investigating the effect of pharyngeal packing on the incidence of sore throat and other associated symptoms in comparison with patients without pharyngeal packing in jaw surgeries.

Materials and Methods

The present study was a randomized clinical trial with the aim of comparing the frequency and severity of sore throat as well as associated symptoms in jaw surgery with and without the use of a pharyngeal pack. The target population of this study was the patients undergoing jaw surgery hospitalized in two medical training centers, Shafa and Shahid Bahonar, Kerman city. The criteria for entering the study included all candidates for jaw surgery with the same duration of operation and Malampathi class I-II, and patients with difficult airway, Malampathi class higher than II, laryngoscopy lasting more than 15 seconds, number of laryngoscopy more than once, compulsion Increasing the pressure of tracheal tube cuff due to leak and patients with sore throat before operation were excluded from the study.

60 patients were included in the study based on the inclusion and exclusion criteria of the study based on available sampling. Informed consent was obtained from all patients to enter the study. Patients were randomly divided into two groups with a ratio of one to one. The method of assigning patients to two groups was by using a table of random numbers. In the first group, including 30 patients, gauze soaked with normal saline solution with a volume of 10 cc was used for throat packing, and in the other group,

throat packing was not used. The study was double-blind, so that patients and data collectors did not know about the allocation of people to each of the groups.

Before the jaw surgery, all patients were put under general anesthesia with the same method with fentanyl 2 µ/kg, midazolam 0.03 mg/kg, propofol 1 to 2.5 mg/kg and atracurium with a dose of 0.5 mg/kg. The TIVA method was used with propofol infusion at a dose of 50-150 µg/kg/min and remifentanil at a dose of 0.1 to 0.4 µg/kg/min. Intratracheal intubation was performed with tube number 8 for men and tube number 7 for women by an experienced specialist. The brand of tracheal tube used was Supa, and the tracheal tube used in all patients was of this brand.

After confirming the intubation by auscultation and capnogram, the pressure of the intubation cuff was set between 15-25 mmhg by a special manometer, and then in the intervention group, a pharyngeal pack was placed in the throat during laryngoscopy with Magill forceps, and at the end of the surgery, before extubation, the pharyngeal pack was placed. It was removed and then the patient was extubated. According to the dose of morphine consumed during the operation (0.1 to 0.15 kg/mg), after the operation only 2.5 mg of intravenous morphine was given after transfer to the ward.

Data Collection

The severity of the patient's sore throat was evaluated at intervals of 2-6-12-24 hours after the operation using the Visual Analog Scale, which had been given adequate training to the patient. This scale is a common scale used to assess the intensity of acute pain, the validity and reliability of which has been investigated and confirmed in previous studies [23]. And based on that, the patient expresses the intensity of the pain on an objective scale of zero to ten. In addition to the severity of the sore throat, within 24 hours after the surgery, accompanying symptoms including cough, painful swallowing, harshness of voice, larynx spasm, as well as nausea and vomiting were also questioned and examined. All data were recorded in the data collection form (Figure 1) and used for statistical analysis.

The collected data was analyzed statistically using SPSS version 22 software. Mean, standard deviation, frequency and percentage indices were used to describe the data, and Chi-square and Mann-Whitney tests were used for analytical statistics. The significance level of p-value is less than 0.05 was considered. In order to start the investigations, the present study was reviewed and approved by the Research Ethics Committee of Kerman University of Medical Sciences with ID IR.KMU.AH.REC.1400.096. The present design was also approved in the Iranian Registry of Clinical Trials (IRCT) system with trial ID 58186 and IRCT ID IRCT20210730052019N1. All patients entered the study with informed consent. The patients' information remained confidential with the researchers of the project, and when the results were published, the individual identities of the patients were not mentioned.

Results

60 patients were randomly assigned to two groups with pharyngeal pack (30 patients) and without pharyngeal pack (30 patients) and examined. The two groups were similar in terms of age, weight and height demographic indicators, as well as operation duration and recovery time.

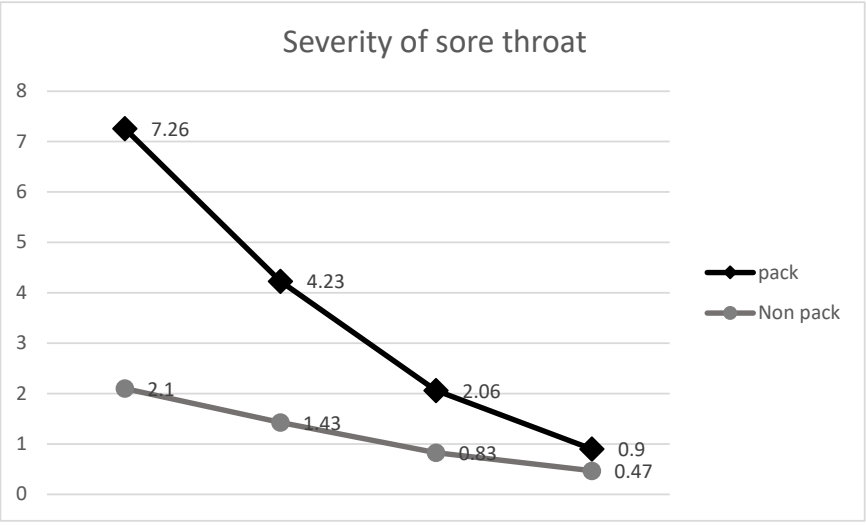

Fig. 1. Severity of sore throat in the two investigated groups according to time according to GEE analysis

Table 1: Mean and standard deviation of age, weight, height and duration of operation and recovery in the two studied groups

Variables	pharyngeal packing	Non-pharyngeal packing	P
Age(yrs)	27.73±7.91	27.03± 11.02	0.41
Weight (kg)	70.13±16.77	71.10±12.52	0.66
Height (cm)	167.9±14.07	168.20±15.98	0.88
sugary time (hours)	3.36±0.61	2.98±0.97	0.14
Recovery time (minutes)	33.66±4.13	35.66±7.84	0.65

Table 2: Distribution of chi-score test, gender and symptoms and demographic characteristics of sore throat patients

Variables		pharyngeal packing	Non-pharyngeal packing	Chi Square Results
		%(Count)	%(Count)	
Sex	Male	23 (76.7)	60(18)	160.
	Female	23.3(7)	40(12)	
Dysphagia	NO	24 (80.0)	25 (83.3)	730.
	YES	6 (20.0)	5 (16.7)	
Hoarseness	NO	26 (86.7)	25 (83.3)	990.
	YES	4 (13.3)	5 (16.7)	
Laryngeal spasm	NO	76/7(23)	26 (86.7)	310.
	YES	23/3(7)	4 (13.3)	
Nausea	NO	23 (76.7)	23 (76.7)	990.
	YES	7 (23.3)	7 (23.3)	
Vomit	NO	26 (86.7)	28 (93.3)	670.
	YES	4 (13.3)	2 (6.7)	
Cough	NO	25 (83.3)	24 (80.0)	730.
	YES	5 (16.7)	6 (20.0)	

Table 3: Comparison of the severity of sore throat according to time in the two studied groups

Sore throat severity scores according to time after surgery	pharyngeal packing	Non-pharyngeal packing	Mann-Whitney test results
	SD±Mean	SD±Mean	
2 Hours	7.26 ± 1.43	2.1 ± 1.02	0.001>
6 Hours	4.23 ± 1.73	1.43 ± 1.04	0.001>
12 Hours	2.06 ± 1.43	0.83 ± 0.83	0.001
24 Hours	0.9 ± 0.95	0.46 ± 1.67	0.002

Out of 60 examined patients, 41 were men and 19 were women. There was no statistically significant difference in terms of gender between the two groups.

In the pharyngeal pack group, 16.7% of patients complained of dysphagia after surgery, which was equal to 20% in the group without pharyngeal pack, but there was no statistically significant difference between the two groups. In the pharyngeal pack group, 13.3% of patients complained of voice harshness after surgery, which was 16.7% in the group without pharyngeal pack, and no significant difference was observed between the two groups.

In terms of occurrence of laryngeal spasm after surgery, there was no significant difference between the two groups, so that 3.23% in the laryngeal pack group and 3.13% in the no-pack group had laryngeal spasm.

In the pharyngeal pack group, the rate of nausea and vomiting after the operation was 3.23% and 7.6%, respectively, and this rate for the group without pharyngeal pack was 3.23% and 3.13%, respectively, and there was no significant difference between the two groups.

In the pharyngeal pack group, 20% of patients and in the group without pharyngeal pack, 7.16% of patients complained of cough after surgery, and there was no significant difference between the two groups.

In inter-group comparisons, it was observed that the sore throat severity score in the second hour ($p<0.001$), the sixth ($p>0.001$), the twelfth

hour (p=0.001) and the 24th hour (p=0.002) had a significant difference between the two groups. Thus, in all these times, the sore throat severity score in the pharyngeal pack group was significantly higher than the group without pharyngeal pack.

Figure 1 also shows that over time the throat pack group had more severe sore throat than the group without throat pack.

Discussion

The findings of the authors' study also showed that in the time intervals of 2, 6, 12 and 24 hours after the operation, the severity of sore throat in patients who were followed by pharyngeal pack was significantly higher than that of patients who did not have pharyngeal pack. This finding is in confirmation of the recent study of Faro et al. in jaw surgery because these researchers also calculated the frequency of sore throat and its severity in 24 hours after surgery in the pharyngeal pack group than in the no pack group [9]. The increase in sore throat in patients with pharyngeal packing is not only specific to jaw surgeries, but many studies in other surgeries, including nose surgery, have reported similar results to our study. For example, in a meta-analysis study by Jin et al., it has been shown that the incidence of sore throat after nasal surgery in the pharyngeal pack group was significantly higher than in the control group up to 2 hours after the operation [24]. Al-lami et al also reported more sore throat after rhinoplasty during initial recovery in the group with a pack than in the group without a pack. Basha et al. reported a similar finding at 2 hours and 6 hours after rhinoplasty, and Karbas Furoshan et al. also calculated the severity of sore throat after nasal surgery in the group with pharyngeal pack compared to the control group [22, 25, 26]. In addition to jaw and nose surgeries, the findings regarding sinus-related surgeries also indicate more severe sore throat in the group with pharyngeal pack. For example, Green et al.'s study on functional endoscopic sinus surgery shows an increase in sore throat 24 hours after surgery in the group with a pack compared to the group without a pack [27]. The findings of the authors' study showed that the use of throat pack compared to the control group had no difference in the incidence of nausea and vomiting. This finding is in confirmation of many previous studies, including the studies of Faro et al., Powell et al., Al-lami et al., and Green et al. [9, 25, 27, 28] Some studies, including the study by Jin et al., have also shown that the incidence of moderate to severe nausea and vomiting during recovery was higher in the pharyngeal pack group than in the control group [24].

In general, most recent studies do not consider the use of a throat pack to be effective in reducing the incidence and severity of nausea and vomiting after surgery. Some researchers believe that the evidence regarding the role of the pharyngeal pack as a physical barrier in swallowing blood and secretions is incomplete. Moreover, it is unclear whether swallowing blood during surgery can directly increase the amount of nausea and vomiting. Factors such as gender, length of surgery, type of anesthesia, and use of opioids after surgery have been related to the incidence and severity of nausea and vomiting after jaw surgery [29, 30].

The results of the authors' study also showed that in terms of dysphagia and swallowing disorders, there was no significant difference between the two groups with and without packs. This finding contradicts Faro et al.'s study, which reported dysphagia 2 hours after jaw surgery in the group that underwent pharyngeal packing compared to the group without packing [9]. One of the limitations of the present study was the difficulty of measuring this parameter, as swallowing disorders in patients who undergo jaw surgery may be caused by sensory-neural disorders [31, 32]. Therefore, determining whether the pharyngeal pack alone had an effect on this outcome may be due to confounding factors.

In the authors' study, a standard gauze impregnated with saline was used as a pharyngeal pack. Regarding the type of pack used, Meco et al.'s study examined three types of packs (dry, soaked in water, soaked in chlorhexidine and benzydamine) and found no difference between the types of packs in terms of severity of sore throat and nausea and vomiting [33].

In addition to the cases investigated in the authors' study, the use of a pharyngeal pack may be associated with other complications. For example, in the study of Erkalp et al., the use of a throat pack has been associated with an increased risk of oral mucosal ulcers after surgery [34]. Cases of tongue edema have also been reported following the use of a pharyngeal pack [35]. The retention of the pack is still one of the challenges of using the pharyngeal pack, so much so that in a report, 25% of surgeons and anesthesiologists mentioned the experience of an accident related to the retention of the pharyngeal pack [36].

In general, the risks and evidence of the use of the pharyngeal pack and its impact on the clinical outcomes of patients have led some researchers and specialists to reconsider its use in head and neck surgeries to the point where some researchers have stated that there is little evidence in justification for the use of throat packs and its use depends only on the choice of the surgeon and anesthesiologist.

Conclusion

The findings of the present study showed that the use of a pharyngeal pack in jaw surgery was accompanied by an increase in the severity of sore throat, but there was no effect on the occurrence of accompanying symptoms such as nausea, vomiting, harshness of voice, larynx spasm, swallowing disorders and cough in comparison with the group without a pack. The findings of this study, along with other studies in this field, can be a guide to adopt the correct approach of using a pharyngeal pack in jaw surgery patients. It is suggested to compare the types of packs impregnated with different compounds in the clinical outcomes of patients such as sore throat, nausea, vomiting and swallowing disorder in future studies.

Conflicts of Interest

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. The authors declare no conflict of interest.

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