

## Original Article

# Effects of pharyngeal tampon usage for postoperative nausea, vomiting and sore throat in nasal surgery

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**Abstract:** To evaluate the effects of using different kinds of pharyngeal tampons on incidence and duration of postoperative sore throat, nausea and vomiting. A prospective, randomized, controlled trial with 175 patients undergoing nasal surgery were included in this study. Study groups were no pharyngeal tampon (group I), dry tampon (group II), tampon with chlorhexidine (group III), tampon with 0.9% NaCl (group IV) and tampon with lidocaine (group V). The hemodynamic parameters were recorded. The presence of nausea, vomiting and sore throat at postoperative were recorded. A visual analog scale (VAS) scoring was acquired during each inquiry. The patients in group I had higher VAS scores at 12th and 24th hours ( $P < .05$ ). These patients also had more frequent sore throat compared to others (38.9% vs 16%,  $P < .05$ ). The patients in group IV had more frequent nausea and vomiting ( $P < .05$ ) while sore throat was more common in group II ( $P < .05$ ). VAS scores were also higher in patients in group II, especially in early postoperative period ( $P < .05$ ). However in late postoperative period the patients in group I had significantly higher VAS scores ( $P < .05$ ). Tampons with lidocaine or chlorhexidine seem to be reliable choices and are related with less sore throat, nausea and vomiting in postoperative period. Dry tampons were related with high incidence of early postoperative pain. Not using any tampon was associated with increased nausea and vomiting frequency in early postoperative period. Using tampons with NaCl was associated with higher frequency of nausea and vomiting especially after 6th postoperative hour.

**Keywords:** Postoperative analgesia, sore throat, nausea, pharyngeal tampon

## Introduction

Nausea, vomiting and sore throat are common postoperative complaints in patients undergoing nasal surgery. Occurrence of these problems usually depend on multiple factors including degree of hemorrhage, swallowing of blood or irrigation fluid, type of surgical procedures or anesthetic protocols and some individual factors. Pharyngeal tampons are thought to decrease incidence of nausea and vomiting by preventing swallowing of blood and irrigation fluids. On the other hand, usage of tampons might increase incidence of sore throat due to irritation [1].

However we thought that application of tampons with different solutions may have different effects on postoperative complaints. Clinically most common tampon preferences are

dry tampons, tampons with chlorhexidine gluconate, lidocaine or NaCl. In this study we aimed to evaluate effects of using parapharyngeal tampons on incidence and duration of postoperative sore throat, nausea and vomiting.

## Materials and methods

Following regional ethical committee approval and written informed consent to participate in the study, 175 patients (59 female, age;  $33.6 \pm 12.0$  years) scheduled for routine nasal surgery were recruited into this study.  $<18$  years age, ASA III-IV, gastric disease history, occurrence of intraoperative complications, serious systemic diseases, tumor surgery were excluded. Patients had a 8-10 hours' fasting before surgery and no premedication was done. Anesthesia induction was done with thiopental 3-6 mg/kg, rocuronium 0.6 mg/kg, remi-

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**Table 1.** Demographic variables, duration of anesthesia and surgery

	Group I Median (IR)	Group II Median (IR)	Group III Median (IR)	Group IV Median (IR)	Group V Median (IR)	P value
Age (yrs)	29.0 (20.0)	32.0 (20.5)	25.0 (17.0)	33.0 (22.7)	30.5 (20.75)	.646
Gender (F/M)	10/25	16/19	11/24	14/21	8/27	.266
Duration of anesthesia (min)	110.0 (45.0)	110.0 (57.5)	85.0 (40.0)	97.5 (57.5)	100 (45)	.458
Duration of surgery (min)	90.0 (35.0)	92.5 (46.2)	65.0 (42.5)	82.5 (60.0)	72.5 (60)	.143

**Table 2.** Sore throat

	No tampon (group I, n: 35)	All tampon (groups II-V, n: 140)	P value
10th minute	4, 11.4	45, 32.1	.019
1st hour	9, 13.2	66, 47.1	.016
2nd hour	10, 28.6	59, 42.1	.101
4th hour	10, 28.6	37, 26.4	.475
6th hour	10, 28.6	27, 19.3	.165
12th hour	10, 28.6	12, 8.6	.003
24th hour	2, 6.5	7, 5.1	.524

Data presented as n, % patient incidence.

fentanyl, 0.5 mcgr/kg. Anesthesia was maintained with desflurane 4-6% in 50% O<sub>2</sub> and 50% N<sub>2</sub>O. Patients were randomly allocated to one of the five groups. Group I (n: 35) no pharyngeal tampon; Group II (n: 35) dry tampon; Group III (n: 35) tampon with chlorhexidine gluconat 0.2% 10 cc; Group IV (n: 35) tampon with NaCl 0.9% 10 cc and Group V (n: 35) tampon with lidocaine 1% 10 cc. Anesthetist placed the tampon on pharyngeal area by direct visualization and positioned around endotracheal tube without disturbing uvula. Tampon was removed by the same anesthetist just before removing endotracheal tube and patients were extubated after regaining spontaneous respiration. Hemodynamic parameters (systolic and diastolic blood pressures, heart rate) at induction, intubation, during intraoperative period and at the end of anesthesia were recorded. Duration of anesthesia and surgery were recorded. All patients were questioned for presence of sore throat, nausea or vomiting at postoperative 10th minute, 1st, 2nd, 4th, 6th, 12th and 24th hours. A visual analog scaling (VAS) was also performed during questioning. During the postoperative period, when necessary, intravenous metamizol sodium and metoclopramide were used for analgesia, nausea and vomiting.

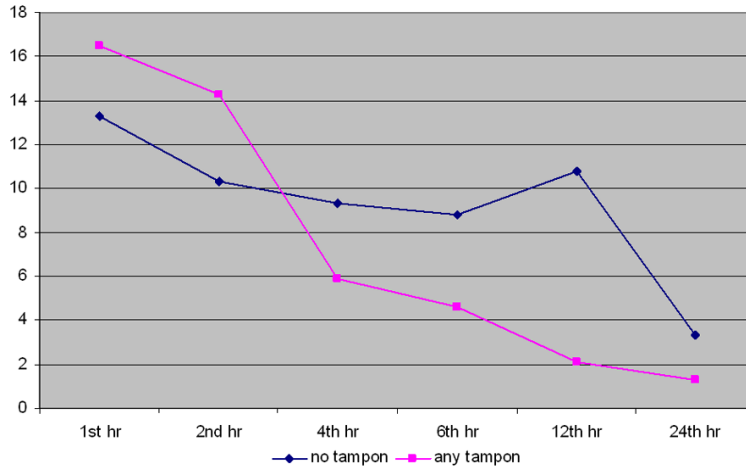
Statistical analyses were performed with SPSS software (Statistical Package for the Social

Sciences, version 15.0, SSPS Inc, Chicago, Ill, USA). Normality of data was analyzed by using a Kolmogorov-Smirnov Test. All numerical variables with normal distribution were expressed as the mean ± standard deviation (SD) while variables with skew distribution were expressed as median (Interquartile range). Oneway ANOVA (Tukey test for post-hoc analyses) and Kruskal-Wallis tests were used for comparing more than two groups. Independent samples t test or Mann-Whitney U tests were used for comparing two groups. A Chi-square test was used for comparing categorical parameters. A P value <0.05 was accepted as statistically significant.

### Results

Two patients were excluded from the study because they swallowed pharyngeal tampons although the tampons were appropriately placed. However no complications due to swallowing has occurred. Demographic variables, duration of anesthesia and surgery were similar in all groups (**Table 1**). In early postoperative period, sore throat was more common in any tampon groups, and in late postoperative period, it was much more common in no tampon group (**Table 2**). In early postoperative period, VAS was higher in any tampon groups and in late postoperative period VAS was higher in no tampon group (**Figure 1**). There was no significant difference between any tampon usage (groups II-V) or no tampon usage (group I) in terms of nausea/vomiting incidence. When we compare all 5 groups with each other we found that sore throat was more common in dry tampon group, especially in early postoperative period while it was less common in lidocaine tampon group for all postoperative period (**Table 3**). Group II (dry tampon) also had highest VAS in postoperative 1-6 hrs, while group V (lidocaine) had lowest VAS scores nearly for all measurements (**Figure 2**). Nausea was a common complaint in “no tampon group” while it was not a significant problem in “chlorhexidine” and especially “lidocaine tampon” groups.

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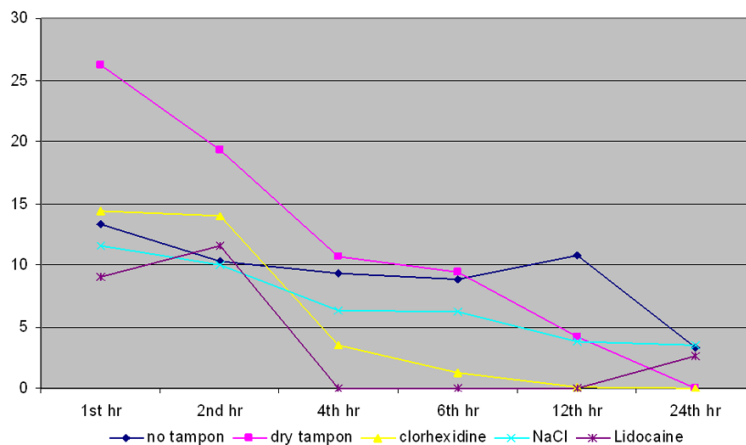


**Figure 1.** VAS was higher in “any tampon group” in early postoperative period while it was higher in “no tampon group” in late postoperative period.

**Table 3.** Sore throat

	Group I	Group II	Group III	Group IV	Group V	P value
10th minute	4, 11.4	22, 62.9	12, 34.3	7, 20	4, 11.4	.0001
1st hour	9, 25.7	22, 62.9	24, 68.6	13, 37.1	7, 20	.0001
2nd hour	10, 28.6	23, 65.7	22, 62.9	10, 28.6	4, 5.8	.0001
4th hour	10, 28.6	15, 42.9	11, 31.4	8, 22.9	3, 8.6	.024
6th hour	10, 28.6	12, 34.3	5, 14.3	9, 25.7	1, 2.7	.01
12th hour	10, 28.6	5, 14.3	1, 2.9	6, 17.1	0, 0	.002
24th hour	2, 5.7	1, 2.9	0, 0	5, 14.3	1, 2.9	.05

Data presented as n, % patient incidence.



**Figure 2.** Group II (dry tampon) had highest VAS in postoperative 1-6 hrs, while group V (lidocaine) had lowest VAS scores nearly for all measurements.

At 12th hour there was no significant nausea problem except “NaCl tampon” group. This group had a stable trend of nausea (11.4-22.9%) that lasted longer than any other groups (>12 hrs, **Table 4**). The patients in “lidocaine

group” never had vomiting complaint. Vomiting in “chlorhexidine group” was also not a significant problem (0-2.9%). It was common in “no tampon group” in early postoperative period and in “NaCl group” in late postoperative period (**Table 5**).

### Discussion

Nausea, vomiting and sore throat are common complaints after oropharyngeal surgery. The etiological factors causing this complication are endotracheal tube size, cuff design and pressure, nasogastric tubes, lubricants, muscle relaxants and pharyngeal packs [1].

There are many studies reporting that tampon usage may have no effect or even increase sore throat without decreasing nausea and vomiting [2-6].

These previous studies usually compared dry tampons with controls but in the present study we aimed to evaluate effects of using different kinds of pharyngeal tampons on incidence and duration of postoperative sore throat, nausea and vomiting.

Endotracheal intubation itself may be a reason for postoperative sore throat. Jaensson et al evaluated the effect of endotracheal tube size on risk of sore throat in healthy women and they concluded that smaller size tube may decrease sore throat and discomfort during postoperative period [7].

Basha et al evaluated the effect of pharyngeal pack on incidence of sore throat during nasal surgery and they found that packing had no effect on the incidence of postoperative nausea and vomiting but increase the incidence of

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**Table 4.** Nausea

	Group I	Group II	Group III	Group IV	Group V	P value
10th minute	5, 14.3	10, 28.6	1, 2.9	5, 14.3	4, 11.4	.044
1st hour	10, 28.6	7, 20	2, 5.7	8, 22.9	3, 8.6	.055
2nd hour	9, 25.1	4, 11.4	4, 11.4	6, 17.1	1, 2.9	.078
4th hour	5, 14.3	3, 8.6	1, 2.9	4, 11.4	0, 0	.128
6th hour	7, 20	2, 5.7	0, 0	5, 14.3	0, 0	.005
12th hour	2, 5.7	0, 0	0, 0	4, 11.4	0, 0	.026
24th hour	0, 0	1, 2.9	0, 0	1, 2.9	0, 0	.552

Data presented as n, % patient incidence.

**Table 5.** Vomitting

	Group I	Group II	Group III	Group IV	Group V	P value
10th minute	0, 0	4, 11.4	0, 0	0, 0	0, 0	.003
1st hour	3, 8.6	2, 5.7	1, 2.9	2, 5.7	0, 0	.492
2nd hour	5, 14.3	2, 5.7	1, 2.9	0, 0	0, 0	.024
4th hour	0, 0	3, 8.6	1, 2.9	1, 2.9	0, 0	.186
6th hour	2, 5.7	2, 5.7	0, 0	3, 8.6	0, 0	.05
12th hour	0, 0	0, 0	0, 0	3, 8.6	0, 0	.016
24th hour	0, 0	0, 0	0, 0	1, 2.9	0, 0	.403

Data presented as n, % patient incidence.

postoperative sore throat [3]. In our study, sore throat was more common in tampon group in early postoperative period while it was more common in no tampon group in late postoperative period. VAS was also higher in any kind of tampon group in early postoperative period while it was higher in no tampon group in late postoperative period. When compared all 5 groups with each other we found that sore throat was more common in dry tampon group, especially in early postoperative period while it was less common in lidocaine tampon group for all postoperative period.

Previous studies demonstrated that postoperative sore throat might occur depending on many factors. Local or intravenous lidocaine administration was also reported to be effective in decreasing sore throat [8-11].

Soltani et al evaluated the effect of lidocaine application on the incidence of postoperative cough and sore throat and they found that using lidocaine to inflate the ETT cuff or intravenous lidocaine at the end of surgery has decreased the frequency of postoperative cough and sore throat [9].

However, this is the first study in literature that analyzed effect of usage of pharyngeal tampon with lidocaine on sore throat.

Nan-Kui et al compared the effect of spraying the endotracheal cuff with benzydamine hydrochloride, 10% lidocaine and 2% lidocaine on postoperative sore throat and they found that there was a lower incidence of postoperative sore throat in the benzydamine hydrochloride group [12]. In another study, Huang and et al evaluated the effectiveness of benzydamine hydrochloride spraying on the endotracheal tube cuff in terms of postoperative sore throat and they found that spraying the cuff with benzydamine hydrochloride decreased the incidence of postoperative sore throat without any benzydamine hydrochloride related side effects [13].

Postoperative nausea and vomiting might develop depending on many factors including used anesthetic agents, surgical procedure, individual factors and gender. In our study, there was no statistically significant difference between the groups in terms of factors causing nausea and vomiting. Amount of swallowed blood during nasal and paranasal surgeries is also an important factor causing nausea and vomiting. Previous studies demonstrated that there is no significant difference between dry tampon and no tampon in means of nausea and vomiting incidence [2]. We found that nausea was a common complaint in "no tampon group" while it was not a significant problem in "chlorhexidine" and especially "lidocaine tampon" groups. Patients in "lidocaine group" never had vomiting complaint. Vomiting in "chlorhexidine group" was also an insignificant problem. On the other hand vomiting was common in "no tampon group" in early postoperative period and in "NaCl group" in late postoperative period.

Previously Erkalp et al reported that pharyngeal dry tampon usage in nasal surgery patients might cause development of aphthous lesions. As these lesions cause sore throat, increase postoperative morbidity and decrease life quality, usage of dry tampons are usually not recommended [13]. In another study done by

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Korkut et al the effectiveness of pharyngeal packing in reducing nausea and vomiting was evaluated and they found that pharyngeal packing had no effect on postoperative nausea and vomiting [14, 15].

Depending on these findings we think that tampons with lidocaine or clorhexidine are reliable choices and related with less sore throat, nausea and vomiting in postoperative period. However dry tampons were related with high incidence of early postoperative pain, possibly due to irritation of local tissue with tampon. Not using any tampon was associated with increased nausea and vomiting frequency in early postoperative period. We think that this may be a result of increased swallowing of blood or irrigation fluid during surgery. However we also found that using tampons with NaCl was associated with higher frequency of nausea and vomiting especially after 6th postoperative hour. This seems to be a result of side effects of NaCl swallowing on esophagus and stomach.

As a conclusion we think that tampons with lidocaine or clorhexidine might be good choices for decreasing postoperative nausea, vomiting and sore throat. In our clinic we use tampons with lidocaine or clorhexidine and in order to alleviate postoperative sore throat, nausea and vomiting we strongly recommend the use of them in patients undergoing nasal surgery.

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### Disclosure of conflict of interest

None.

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### References

[1] Tay JY, Tan WK, Chen FG, Koh KF, Ho V. Postoperative sore throat after routine oral sur-

gery: influence of the presence of a pharyngeal pack. *Br J Oral Maxillofac Surg* 2002; 40: 60-3.

- [2] Piltcher O, Lavinsky M, Lavinsky J, de Oliveira Basso PR. Effectiveness of hypopharyngeal packing during nasal and sinus surgery in the prevention of PONV. *Otolaryngol Head Neck Surg* 2007; 137: 552-54.
- [3] Basha SI, McCoy E, Ullah R and Kinsella JR. The efficacy of pharyngeal packing during routine nasal surgery - a prospective randomised controlled study. *Anesthesia* 2006; 61: 1161-65.
- [4] Marais J, Prescott RJ. Throat pain and pharyngeal packing: a controlled randomized double-blind comparison between gauze and tampons. *Clin Otolaryngol Allied Sci* 1993; 18: 426-9.
- [5] Appadurai R, Tomkinson A. Pharyngeal packing during ENT surgery. *Anesthesia* 2007; 62: 631-642.
- [6] Gan TJ, Meyer T, Apfel CC, Chung F, Davis PJ, Eubanks S, Kovac A, Philip BK, Sessler DI, Temo J, Tramèr MR, Watcha M; Department of Anesthesiology, Duke University Medical Center. Consensus Guidelines for Managing Postoperative Nausea and Vomiting. *Anesth Analg* 2003; 97: 62-71.
- [7] Jaensson M, Olowsson LL, Nilsson U. Endotracheal tube size and sore throat following surgery: a randomized-controlled study. *Acta Anaesthesiol Scand* 2010; 54: 147-153.
- [8] Navarro RM, Baughman VL. Lidocaine in the endotracheal tube cuff reduces postoperative sore throat. *J Clin Anesth* 1997; 9: 394-7.
- [9] Soltani HA, Aghadavoudi O. The effect different lidocaine application methods on postoperative cough and sore throat. *J Clin Anesth* 2002; 14: 15-8.
- [10] McHardy FE, Chung F. Postoperative sore throat: cause, prevention and treatment. *Anaesthesia* 1999; 54: 444-53.
- [11] Tanaka Y, Nakayama T, Nishimori M, Sato Y, Furuya H. Lidocaine for preventing postoperative sore throat. *Cochrane Database Syst Rev* 2009; CD004081.
- [12] Hung NK, Wu CT, Chan SM, Lu CH, Huang YS, Yeh CC, Lee MS, Cherng CH. Effect of postoperative sore throat of spraying the endotracheal tube cuff with benzydamine, hydrochloride, 10% lidocaine and 2% lidocaine. *Anesth Analg* 2010; 111: 882-886.
- [13] Huang YS, Hung NK, Lee MS, Kuo CP, Yu JC, Huang GS, Cherng CH, Wong CS, Chu CH, Wu CT. The effectiveness of benzydamine hydrochloride spraying on the endotracheal tube cuff or oral mucosa for postoperative sore throat. *Anesth Analg* 2010; 111: 887-91.
- [14] Erkalp K, Korkut YA, Meric A, Kahya V, Gedikli O, Su OK, Saitoglu L. Pharyngeal packing is a

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predisposing factor for postoperative aphthous stomatitis in nasal surgery. *Otolaryngol Head Neck Surg* 2010; 142:672-6.

- [15] Korkut AY, Erkalp K, Erden V, Teker AM, Demirel A, Gedikli O, Saidoglu L. Effect of pharyngeal

packing during nasal surgery on postoperative nausea and vomiting. *Otolaryngol Head Neck Surg* 2010; 143: 831-6.