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Review Article

Review of the use of throat packs in nasal surgery

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Abstract

Background: Throat packs are employed in nasal surgery to prevent contamination of the upper aerodigestive tract. Their use is thought to reduce the risk of aspiration and post-operative nausea and vomiting. However, use of throat packs may also be accompanied by increased throat pain. In order to inform our clinical practice, the evidence base for throat pack insertion was reviewed.

Method: A search was made of the Pubmed database from the 1950s to March 2008. Four randomised, controlled, clinical trials were reviewed.

Results: All the trials had significant methodological weakness. In all but one, no power calculations were done. There were inconsistencies in the measurement of pain and heterogeneity of rhinological procedures. The one adequately powered trial could not demonstrate a difference in post-operative nausea and vomiting with the use of throat packs (β error = 20 per cent).

Conclusion: Further, adequately powered trials are required involving patients undergoing rhinological procedures with a higher risk of blood contamination (e.g. functional endoscopic sinus surgery), in order to provide definitive evidence on the morbidity of throat packs in rhinological procedures.

Key words: Pharynx; Pain; Inhalation; Postoperative Period; Nausea; Vomiting; Nose; Surgical Procedures, Operative; Surgery; Anesthetics, General

Introduction

Posterior oropharyngeal packing is employed to protect the upper aerodigestive tract from bloody contamination during nasal surgery. It is assumed that packing will protect the airway from aspiration, and also protect the oesophagus and stomach from blood and thus reduce post-operative nausea and vomiting.

The side effects and complications of oropharyngeal packing are primarily throat pain and mucosal injury. Historically, forgotten packs have led to aspiration; however, the risk of this is minimal today.

Studies from the 1960s demonstrated that post-operative throat pain occurred in 10 per cent of patients even when they had been ventilated via face mask, but was more prevalent after intubation (40 per cent) and if pharyngeal packs had been used (61 per cent).[1–3] A more recent study of 1325 patients set the incidence of post-operative throat pain after tracheal intubation at 14.4 per cent.[4] This study also showed that there was no correlation of severity or incidence of sore throat with duration of intubation or number of intubation attempts. However, all these patients were intubated with cuffed endotracheal tubes lubricated with lignocaine jelly. It is more difficult to quantify the incidence of post-operative nausea and vomiting after nasal or ENT surgery. Furthermore, neither pharyngeal packing nor an inflated endotracheal tube cuff provides complete protection to the airway.

Water-soaked, gauze throat packs had been used during most nasal (rhinological) procedures in our department. In order to inform our clinical practice, the evidence base for throat pack insertion was reviewed.

Search strategy

The Pubmed search engine was employed. The following two search term queries were used: (1) 'pharyngeal pack' (all fields) or 'pharyngeal packing' (all fields) or 'pharyngeal packs' (all fields); and (2) 'throat pack' (all fields) or 'throat packing' (all fields) or 'throat packs' (all fields).

These two search queries were combined and 43 references located, comprising trials, case reports and letters.

Four randomised, clinical trials were chosen from the 43 results. These four trials are critically appraised below.[5–8]

Critical appraisal

The four randomised, controlled trials identified are summarised in Table I. They were conducted by

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TABLE I

SUMMARY OF THE FOUR RANDOMISED, CONTROLLED TRIALS INCLUDED

Study	Power calculation	Comments	Patients included	Outcome
Marais & Prescott[5]	None	Gauze *vs* tampons *vs* intubated only	40 in each arm (120 total)	Gauze most painful
Elhakim *et al.*[6]	None	Tenoxicam (NSAID) soaked packs *vs* saline-soaked packs	40 in each arm (80 total)	Saline gauze swabs more painful
Basha *et al.*[7]	80 patients required to detect 'clinically significant difference in throat pain'	No definition of 'clinically significant difference', no power calculation for PONV	45 packed 48 unpacked	Packing more painful & higher chance of PONV immediately post-op
Piltcher *et al.*[8]	71 patients needed in both groups to detect 20% difference between 2 groups, if PONV in 10% of controls *vs* 30% of intervention group (5% α, 20% β)	Total of 142 patients needed Throat pain a secondary outcome & not included in power calculation	70 packed 74 unpacked	No difference in throat pain or PONV in 24-h post-op period

NSAID = non-steroidal anti-inflammatory drug; PONV = post-operative nausea and vomiting; post-op = post-operative

Marais and Prescott,[5] Elhakim *et al.*, [6] Basha *et al.*[7] and Piltcher *et al.*[8]

Marais and Prescott were the first to carry out a blinded, randomised, controlled trial to compare throat pain in patients who received pharyngeal gauze packs, pharyngeal tampons or just intubation.[5] The patients underwent 'routine nasal surgery' but the procedures were not specified. Throat pain was measured twice (6 hours post-operatively but prior to analgesia on the ward, and 24 hours post-operatively) by direct questioning and scored on an author-devised Likert scale. This scale grouped responses into: no pain, mild pain, moderate pain or severe pain. Chi-square tests of significance were performed (Table II).

Marais and Prescott found a statistically significant difference only in the degree of severe throat pain experienced by gauze-packed and tampon-packed patients (chi-square = 45 at $p = 0.03$). They concluded that gauze packing was more painful. Post-operative nausea and vomiting were not measured. There were no cases of aspiration, but the numbers required for such an event to occur were probably larger than the study sample. Randomisation and blinding were adequate but no power calculation was performed.

Elhakim *et al.* experimented with throat packs soaked with the hydrophilic, nonsteroidal, anti-inflammatory drug (NSAID) tenoxicam to reduce post-operative throat discomfort.[6] This study excluded patients with asthma or NSAID allergy. However, asthmatic patients and those with a NSAID type I hypersensitivity reaction comprise a patient subgroup likely to have nasal polyps and to require nasal surgery. In addition, the authors excluded patients who required more than one attempt at intubation or who had a 'difficult' airway.

TABLE II

PATIENTS WITH THROAT PAIN AFTER PHARYNGEAL GAUZE PACKING, TAMPONS OR NOTHING

Packing	Pain (*n*)				Total (*n*)
	None	Mild	Mod	Severe	
Gauze	8	17	8	7	40
Tampons	11	23	5	1	40
None*	20	17	2	1	40

*Intubated only. Reproduced with permission.[5] Mod = moderate

Elhakim and colleagues compared the prevalence of post-operative sore throat following the use of tenoxicam-soaked and saline-soaked swabs in 80 patients undergoing submucous nasal resection, within a randomised, controlled trial setting. Randomisation and blinding were adequate but no power calculation was performed. In all cases, a puff of beclomethasone was sprayed onto the trachea following extubation as the authors felt this decreased the incidence of sore throat post-intubation.

Elhakim *et al.* measured throat pain between 12 and 24 hours after the procedure. Sore throats generally tend to improve over time and with analgesia, and this means that significant variation in the endpoint was introduced. Throat pain was quantified by direct questioning and graded as none, mild, moderate or severe, together with its duration; as follows: 'mild' indicated 'scratchy' throat pain that disappeared on swallowing and which resolved within 3 to 6 hours post-operatively; 'moderate' indicated throat soreness which had disappeared by the time of interview; and 'severe' indicated throat soreness lasting 24 hours or more. This was an arbitrary classification which could only be applied retrospectively 24 hours after the procedure.

Elhakim and colleagues found that 40 per cent of patients with saline-soaked throat packs reported throat pain, compared with 10 per cent of those with tenoxicam-soaked packs. However, further data regarding the role of tenoxicam-soaked packs are required, for three reasons. First, the tool used to measure throat pain was not comparable to those used in other studies. Second, no power calculation was performed. Third, the patients most likely to have nasal polyposis and thus to undergo functional endoscopic sinus surgery (FESS) or nasal polypectomy were likely to have been excluded.

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Basha *et al.* sought to determine the 'efficacy' of pharyngeal packing in a randomised, controlled trial setting.[7] However, they only performed a power calculation (presented vaguely in the methods section) for a 'clinically significant difference in throat pain'. No specific exclusion criteria were used, and only those patients with incomplete data sets were excluded ($n = 7$). The type of surgery was varied and included: septoplasty, trimming of inferior turbinates, septoplasty and trimming of inferior turbinates, FESS, polypectomy, rhinoplasty, septorhinoplasty, and submucous diathermy to turbinates. Whilst the authors justified such a breadth of procedures as being closer to 'real life' practice, some of these procedures are more likely to cause significant blood loss than others (e.g. FESS). Twice as many FESS procedures were undertaken in patients not receiving a pharyngeal pack.

Basha and colleagues appear to have measured efficacy using clinical indicators of aspiration (i.e. desaturation of less than 90 per cent, chest pain and cough). None occurred in either group, but again it is difficult to determine the sample size required to demonstrate significance. Post-operative nausea, vomiting and throat pain were measured on a visual analogue scale from zero to 10 at the following times: immediately after surgery in the recovery room, 2 hours later, 6 hours later, and the time of discharge (approximately 24 hours later). The authors then grouped post-operative pain, nausea and vomiting into mild, moderate and severe according to the corresponding range on the visual analogue scale. This was the first study to measure these variables at standardised times after surgery, and so early after surgery.

Immediately after surgery, Basha *et al.* found that the prevalence of nausea, vomiting and throat pain was twice as high in the packed group compared with the non-packed group. At this time, 66 per cent of patients with pharyngeal packs had throat pain and 33 per cent had nausea and vomiting, compared with 33 and 15 per cent of controls, respectively ($p < 0.05$, Mann–Whitney U test). Whilst throat pain decreased in severity over time in both groups, the difference remained statistically significant. However, the prevalence of post-operative nausea and vomiting ceased to differ between the two groups at 2 hours; all patients received ondansetron routinely.

Although the power calculation in Basha and colleagues' study was vague, it does appear that throat pain occurred more often in patients receiving pharyngeal packing. No deleterious clinical effects were noted in non-packed patients, even though more high risk procedures were performed in this group.

Piltcher *et al.*[8] investigated the occurrence of post-operative throat pain, nausea and vomiting after pharyngeal packing. Their power calculation was explicit and assumed that the incidence of post-operative nausea and vomiting would be 10 per cent in unpacked patients and 30 per cent in packed patients (α error = 5 per cent, β error = 20 per cent). The percentage of patients with post-operative nausea and vomiting was similar in both groups (34 per cent in controls and 31 per cent in intervention patients). Throat pain was a secondary measure and no power calculation was performed for this variable. Throat pain occurred similarly within both groups (being noted in 46 per cent of controls and 38 per cent of intervention patients).

The patients involved in Piltcher and colleagues' study (conducted within a Brazilian centre) underwent the following nasal procedures: septoplasty, rhinoseptoplasty (with or without cauterisation of the inferior turbinates), partial inferior turbinectomy with or without septoplasty, and endoscopic sinus procedures (with or without septoplasty). Patients with NSAID allergies were excluded; no reason was given for this. Outcomes were measured by interview conducted within 24 hours of surgery by an investigator blinded to the intervention; however, further details on interview techniques or tools were not given. Randomisation and blinding were adequate. Again, the timing of interview questioning was not standardised, and this problem was compounded by recall bias.

Summary

Our literature search identified four relevant randomised, controlled trials. Two of these trials aimed to examine the efficacy of pharyngeal packing,[7,8] whilst the other two compared pain in packed versus non-packed patients[7] or investigated interventions to reduce pain in packed patients.[5,6]

None of these trials satisfactorily addressed the question of the efficacy of hypopharyngeal packing in terms of post-operative nauses and vomiting following nasal surgery. The best designed trial (notwithstanding the unsatisfactorily explained power calculation) showed that twice as many patients with throat packs had a sore throat immediately after surgery, compared with non-packed patients.[9]

Our critical appraisal of these studies showed that further investigation is necessary in order to confirm best practice.

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