The management of postoperative airway after nasal endoscopic sinus surgery

Ashish Sharma*, Nagababu Pyadala

Department of ENT, MNR Medical College and Hospital, Sangareddy, Telangana, India

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*Correspondence:
Dr. Ashish Sharma,
E-mail: afg3392@gmail.com

ABSTRACT

Background: Nasal surgery followed by nasal packing can be vulnerable due to airway complications like, respiratory blockage and dyspnea. Thus the present study aimed to compare the nasal packing with nasal airway after the nasal surgery for the airway management.

Methods: A total of 120 patients for fibreoptic endoscopic sinus surgery were included in this study. All subjects were equally divided in to 3 groups; group 1, 40 patients with traditional bilateral nasal packing; group 2, 40 patients with 5 mm internal diameter uncuffed ETT in to one of the nostrils and bilaterally in group 3 40 patients. During postoperative period all data were recorded and analyzed by using statistical analysis software 20.0.

Results: In case of group 1 patients cardio-respiratory parameters reported significant variation. Pain and bleeding during removal of nasal airway and discomfort showed significant results among group 1 patients than in group 2 and group 3 patients.

Conclusions: This study showed that the new intervention to manage the airway obstruction has benefits as compared to traditional nasal packing with ease of suctioning, oxygen supplementation.

Keywords: Fibreoptic endoscopic sinus surgery, Airway blockage, Nasal packing, Endoscopy

INTRODUCTION

In head and neck surgery postoperative airway obstruction is most common type of complication. In case of different nasal sinuses, fibreoptic endoscopic sinus surgery (FESS) is widely used intervention to widen the drainage pathway. The concept of FESS has been designed by Messerklinger and focuses at easy mucociliary clearance and postoperative normal ventilation. Other than common postoperative complications like, orbital trauma, intracranial injury, bleeding; various other problems arises such as, embolism, nausa, aspiration, vomiting, myocardial infarction can also happen. The mechanism of breathing is usually very complex phenomenon, which is quite perceived in daily life. Any situation leading to a small blockage in breathing including nasal packing can leads to a sense of discomfort. If any case the obstruction is not removed immediately, it can progress to dyspnea, retention of carbon dioxide and rapid hypoxemia. Therefore it usually very difficult to assess the recovery profile during postoperative period as all these characteristics can alter the sedation levels. Although the preoperative counselling of breathing through mouth is given but it is problematic to maintain due to patients in anaesthetic stage. In resource limited areas it is quite difficult to use costly nasal airway. Therefore, the present study aimed to compare the new interventions to maintain the nasal airway during postoperative period in patients undergoing FESS. The
METHODS

This study was an interventional study conducted in MNR medical college and hospital, ENT department during the period from August 2019 to February 2020. A total of 120 patients undergone FESS surgery were involved in this study. This study was approved by Institutional Human ethical committee. Equal number of patients (40) was divided in three different groups such as group 1, group 2 and group 3. There was significant difference found in overall satisfaction rate in doctors to the results of new intervention in group 2 and 3 with traditional nasal packing in group 1 patients (p<0.0002) (Table 2).

RESULTS

A total of 120 patients were under gone FESS during the study period. The age group ranged between 17-59 years. There was no significant difference found in between various variables such as, age, sex, weight, height, and mean surgery period (Table 1). Postoperative variables were recorded during recovery period (Table 2). There was no pain and discomfort found in most of the patients belongs to group 2 and group 3. There was significant difference found in overall satisfaction rate in doctors to use such interventions like laryngeal mask airway or nasopharyngeal airway as a excellent method to prevent airway obstruction, but due to its high cost, it is limited for use in India.

Table 1: Demographic data of patients under gone FESS.

| Demographic data | Group 1 (n=40) | Group 2 (n=40) | Group 3 (n=40) | P value |
|------------------|----------------|----------------|----------------|---------|
| Age              | 31             | 29             | 28.2           |         |
| Sex (male/female)| 22/18          | 19/21          | 28/12          |         |
| Weight           | 62             | 57             | 65             |         |
| Height           | 165.3          | 165.2          | 167.8          |         |
| Duration of surgery in minutes | 107.53 | 114.43 | 119.27 |         |

Table 2: Postoperative parameters and variables related with nasal packing in 3 different groups.

| Post-operative parameters | Group 1 | Group 2 | Group 3 | P value |
|---------------------------|---------|---------|---------|---------|
| Respiratory rate          | 19      | 15.45   | 14.4    | 0.015   |
| Pain/discomfort           | Pain-25.4 | Discomfort-55.3 | No pain/discomfort-17.6 | Pain-11 | Discomfort-22.3 | No pain/discomfort-68.4 | Pain-12 | Discomfort-26.3 | No pain/discomfort-62.1 | <0.0001 |
| Discomfort during nasal packing | No discomfort-10 | Mild discomfort-27.5 | Moderate discomfort-57.3 | Extreme discomfort-5.6 | No discomfort-37.4 | Mild discomfort-24.6 | Moderate discomfort-57.3 | Extreme discomfort-3.2 | No discomfort-24.5 | Mild discomfort-0.4 | Moderate discomfort-14.6 | Extreme discomfort-5.2 | <0.03 |
| Bleeding from nostril during removal of packing | No bleeding-67.8 | Mild bleeding-29 | Moderate bleeding-2.7 | Heavy bleeding-0 | No bleeding-92 | Mild bleeding-9 | Moderate bleeding-1 | Heavy bleeding-0 | No bleeding-84 | Mild bleeding-12 | Moderate bleeding-4 | Heavy bleeding-0 | <0.0001 |
| Overall satisfaction of the surgeon | Satisfied-35 | Neutral-46.3 | Negative-30.4 | Satisfied-72 | Neutral-28 | Negative-0 | Satisfied-85 | Neutral-15 | Negative-0 | <0.0001 |

DISCUSSION

Several methods are available for the prevention of any airway obstruction and breathing problem after head, neck and nose surgery with different level of success. However, the important matter to use such interventions in developing nations like India includes the cost and availability of necessary equipment. Although there are interventions like laryngeal mask airway or nasopharyngeal airway as an excellent method to prevent airway obstruction, but due to its high cost, it is limited for use in India. In this present study we evaluated the
potential use of low cost sterilized uncuffed ETT in patients undergoing FESS. In most of the patients, apart from preoperative counselling, it is difficult to manage the normal breathing through mouth during the immediate postoperative period after bilateral nasal packing. In this study all patients were studied for 4 hours during immediate postoperative period for any complications like, respiratory rate, pulse oximetry (SpO2) and haemodynamic variables such as, mean MAP and HR, which is significantly higher while oxygen saturation was lower in group 1 patients. This study made the useful benefits of nasal conduits in not only manage the normal breathing and oxygen saturation; it can also maintain the cardiac parameters. However, apart from managing nasal airway, other potential benefits of these interventions such as, haemostatic effect of ETT, comfortable of suctioning through nasal ETT, easy oxygen supplementation, prevent oedema and fibrosis in operative site. The discomfort and pain because of placement of nasal airway during post-operative period is one of the most critical factor which makes us to design and conducting this study. The response for newer interventions among patients was excellent as only 9% and 21.4% in group 3 and 12% and 25.3% in group 2 suffered from mild discomfort and pain as compared to 26.2% and 54.6% in group 1 patients. Our findings showed clinically and statistically significant which establishes the potential benefits of designing the present study. Similar result showed by Holden et al. which supported our study of newer interventions in nasal packing with ETT. The complications such as, COPD, obstructive sleep apnea and cardiac diseases increases the difficulty to manage patients due to deep sedation and anaesthesia level. The post operative period in these patients can be difficult to manage if they fail to breathe through mouth. In the present study we did not phase such complications in group 2 and 3 patients. The bronchospasm, laryngospasm, uvular edema and bleeding are the major complications of nasal packing and failure to breathe through mouth. Due to these reasons the nasal pack swell like tampon and create pressure on the soft tissues of the pharynx, hence causing venous stasis and edema. Approximately 6% of patients develops Samster’s triad in whom FESS for removal of nasal polyps can leads to bronchospasm in response to drugs such as, aspirin and non-steroidal anti-inflammatory drugs. The subjective assessment of the present procedure was recorded by the surgeons and anaesthesiologist depend on the post-operative variables. These records showed that the present airway procedure satisfied 65% and 76% of surgeons and 75% and 84% of anaesthesiologists in both group 2 and 3. Sukhminder et al study reported also the similar type of findings regarding satisfaction level in surgeons and anaesthesiologists. In this study dexmedetomidine was used before induction of anaesthesia which can decreases the anaesthetic and analgesic requirements besides reducing the incidence of shivering and maintain haemodynamic variables in pre-operative and post-operative period. Similar interventions were used by Sukhminder et al and Bajwa et al which showed similar result as compared to our findings. The hypopharyngeal packing can reduces the nasal bleeding during surgery on nasal sinuses. Basha et al and Pilcher et al study also reported the reduction of bleeding during nasal surgery. The distal end of the pack was knotted and kept inferior to the ETT and the other portion placed in compact manner so it can prevent bleeding in the aero-digestive tract.

CONCLUSION
The present study showed that there was excellent outcome to use these newer interventions. The other benefits such as, comfortable suctioning, oxygen supplementation and possible haemostatic effect. The most important part in these newer interventions are low cost and easy to use instead of traditional nasal packing.

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