J Surg Med. 2019;3(8):598-599.
DOI: 10.28982/josam.607950

Research article
Araştırma makalesi

Journal of Surgery and Medicine
e-ISSN: 2602-2079

Extubation failure in operating room: Review of management in 50 patients at a single center

Ameliyat sonrası ekstübe edilemeyen hastalar: Tek merkezde 50 vakanın incelenmesi

Tumay Uludağ Yanaral [1]

[1] **Department of Anesthesiology, Medipol Universty Faculty of Medicine, Istanbul, Turkey**

ORCID ID of the author(s)
TUY: 0000-0003-3917-8183.

Abstract

Aim: Postoperative extubation failure is a serious complication of general anesthesia. Prolonged mechanical ventilation is associated with increased morbidity and late mortality. There are numerous factors affecting postoperative extubation failure. In our study, we aimed to evaluate these factors.

Methods: This retrospective cohort study was conducted on 50 patients who could not be extubated postoperatively between January 2016 and January 2019 in Medipol University Medical Faculty Hospital.

Results: The mean age was 61.2 (6.4) (50-77) years. 29 (58%) patients were male and 21 (42%) were female. The mean Body Mass Index was 29.3 (3.6) (12-36) kilogram/square meters (kg/m^2). Mean duration of surgery was 240 (27.6) minutes. 39 (78%) patients had chronic obstructive pulmonary disease and 13 (26%) had congestive heart failure. Perioperative oxygen saturation was ≤95% in 44 (88%) patients and >95% in 6 (12%) patients.

Conclusions: Chronic obstructive pulmonary diseases, congestive heart failure and low perioperative oxygen saturation are commonly seen in patients who could not be weaned from mechanical ventilation postoperatively. We advise watching out for patients with these risk factors.

Keywords: Extubation, Chronic obstructive pulmonary disease, Congestive heart failure, Perioperative oxygen saturation

Öz

Amaç: Ameliyat sonrası ekstübe edilemeyen hastalar genel anestezi için ciddi bir durumdur. Uzun süreli mekanik ventilasyon artmış morbidite ve geç mortalite ile ilişkilidir. Ameliyat sonrası ekstübe edilememeyi etkileyen birçok faktör vardır. Çalışmamızda, bu faktörleri araştırdık.

Yöntemler: Bu retrospektif kohort çalışma, Ocak 2016 - Ocak 2019 tarihleri arasında Medipol Üniversitesi Tıp Fakültesi Hastanesi'nde ameliyat sonrası ekstübe edilemeyen 50 hasta üzerinde yapıldı.

Bulgular: Yaş ortalaması 61,2 (6,4) (50-77) yıldı. 29 (%58) hasta erkek, 21 (%42) hasta kadındı. Ortalama Vücut Kitle İndeksi 29,3 (3,6) (12-36) kilogram / metrekare (kg/m^2), ortalama ameliyat süresi 240 (27,6) dakikaydı. Kronik obstrüktif akciğer hastalığı olan 39 (%78) hasta, konjestif kalp yetmezliği olan 13 (% 26) hasta vardı. Perioperatif oksijen satürasyonu 44 (%88) hastada ≤%95 ve 6 (%12) hastada >%95 idi.

Sonuçlar: Ameliyat sonrası ekstübe edilemeyen hastalarda kronik obstrüktif akciğer hastalıkları, konjestif kalp yetmezliği ve düşük perioperatif oksijen satürasyonu sıklıkla görülmektedir. Bu hastaların yönetiminde daha dikkatli olunması gerektiğini düşünüyoruz.

Anahtar kelimeler: Ekstübasyon, Kronik obstrüktif akciğer hastalığı, Konjestif kalp yetmezliği, Perioperatif oksijen satürasyonu

Corresponding author / Sorumlu yazar:
Tumay Uludağ Yanaral
Address / Adres: Anesteziyoloji Anabilim Dalı Medipol Üniversitesi Tıp Fakültesi, TEM Avrupa Otoyolu Göztepe Çıkışı No: 1, 34214, Bağcılar, İstanbul, Türkiye
e-Mail: uludagt@yahoo.com

Ethics Committee Approval: Ethics committee approval was not obtained because of the retrospective design of the study.
Etik Kurul Onayı: Etik kurul onayı çalışmanın retrospektif dizaynından dolayı alınmamıştır.

Conflict of Interest: No conflict of interest was declared by the authors.
Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Financial Disclosure: The authors declared that this study has received no financial support.
Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

Published: 8/26/2019
Yayın Tarihi: 26.08.2019

How to cite / Atıf için: Yanaral TU. Extubation failure in operating room: Review of management in 50 patients at a single center. J Surg Med. 2019;3(8):598-599.

Introduction

Patients are usually extubated postoperatively once ventilatory support or airway protection needs subside. However, some patients cannot be weaned from mechanical ventilation during this period [1]. The risk factors for failure of extubation include old age, male gender, smoking, high American Society of Anesthesiologists (ASA) score, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), and obesity [2]. Prolonged mechanical ventilation is associated with increased morbidity, long hospital stays and late mortality [3,4]. In this study, we aimed to evaluate patients who could not be extubated after surgery.

Materials and methods

This retrospective cohort study was conducted on 50 patients who could not be extubated postoperatively between January 2016 and January 2019 in Medipol University Medical Faculty Hospital. The age, gender, BMI, ASA score, presence of COPD or CHF and perioperative oxygen saturations of these patients were recorded.

Inclusion criteria

Patients older than 50 years with an ASA of I-III who underwent open elective abdominal surgery that lasted more than 200 minutes under general anesthesia were included in this study.

General anesthesia

Patients were premedicated with intravenous midazolam. General anesthesia was induced with propofol and fentanyl followed by vecuronium to facilitate endotracheal intubation. Anesthesia was maintained with sevoflurane and remifentanil titrated to maintain adequate anesthetic depth and hemodynamic stability by clinical monitoring.

Statistical analysis

Continuous variables with normal distribution are presented as mean (standard deviation). Categorical variables are presented as percentage and number.

Results

The mean age was 61.2 (6.4) (50-77) years. 29 (58%) patients were male and 21 (42%) were female. The mean Body Mass Index was 29.3 (3.6) (12-36) kilogram/square meters (kg/m^2). Mean duration of surgery was 240 (27.6) minutes. Mean ASA score was 1.6 (0.6) (2-3). 39 (78%) patients had chronic obstructive pulmonary disease and 13 (26%) had congestive heart failure. Perioperative oxygen saturation was ≤95% in 44(88%) patients and >95% in 6(12%) patients (Table 1).

Table 1: Demographic and clinical data of patients

Parameters	Value	
Age (Years, Mean (SD) (Min-Max))	61.2 (6.4) (50-77)	
Gender (Male/Female) (n/%)	29(58%)/21(42%)	
Body Mass Index (kg/m^2)	29.3 (12-36)	
ASA Physical Status	1.6 (2-3)	
COPD (n/%)	39(78%)	
CHF (n/%)	13(26%)	
Perioperative oxygen saturation (n/%)	≤95%	44(88%)
	>95%	6(12%)

SD: Standard deviation, kg: kilograms, m^2 :square meters, ASA: American Society of Anesthesiologists, COPD: chronic obstructive pulmonary disease, CHF: congestive heart failure

Discussion

The most widely accepted anesthetic method is general anesthesia, endotracheal intubation and controlled mechanical ventilation. Patients are usually extubated after the operation; however, some patients' need for ventilatory support continue during the postoperative period [5]. Its incidence being 1-5% [6,7], prolonged mechanical ventilation is associated with increased morbidity, long hospital stays and late mortality [3,4].

In our study, we evaluated 50 patients who received ventilatory support during the postoperative period. Risk factors for failure of extubation include old age (age>60), male gender, high ASA scores (ASA>2), COPD, CHF, and obesity [2,8]. The duration of surgery (>3 hours), having thoracic, upper abdominal, head and neck surgery, neurosurgery and emergency operations are also reportedly related to postoperative extubation failure [9,10]. The patients included in this study had undergone elective abdominal surgery under general anesthesia.

The postoperative intubation times are long in patients who cannot be weaned in the operation room. Consequently, complications such as atelectasis, pneumonia, pneumothorax, and pulmonary edema are more frequent [11,12]. In our study, 10% (n=5) of the patients developed atelectasis, all of whom improved with respiratory physiotherapy.

Limitations

The limitations of this study are its retrospective nature and small number of patients.

Conclusion

Despite the above-mentioned limitations, we found that COPD, CHF and low peri-operative oxygen saturation are commonly seen in patients who cannot be extubated in the operation room. We believe that necessary measures should be taken in these patients.

References

1. Acheampong D, Guerrier S, Lavarias V, Pechman D, Mills C, Inabnet W, et al. Unplanned postoperative reintubation following general and vascular surgical procedures: Outcomes and risk factors. Annals of Medicine and Surgery. 2018;33:40–3.
2. Johnson RG, Arozullah AM, Neumayer L, Henderson WG, Hosokawa P, Khuri SF. Multivariable predictors of postoperative respiratory failure after general and vascular surgery: results from the patient safety in surgery study. J Am Coll Surg. 2007;204:1188-98.
3. Lee PJ, MacLennan A, Naughton NN, O'Reilly M. An analysis of reintubations from a quality assurance database of 152,000 cases. J Clin Anesth. 2003;15:575-581.
4. Chinachoti T, Chau-in W, Suraseranivongse S, Kitsampanwong W, Kongrit P. Postoperative reintubation after planned extubation in Thai Anesthesia Incidents Study (THAI Study). J Med Assoc Thai. 2005;88:84-93.
5. Ting PC, Chou AH, Yang MW, Ho AC, Chang CJ, Chang SC. Postoperative reintubation after planned extubation: A review of 137,866 general anesthetics from 2005 to 2007 in a Medical Center of Taiwan. Acta Anaesthesiologica Taiwanica. 2010;48:167-71.
6. Marquez-Lara A, Nandyala SV, Fineberg SJ, Singh K. Incidence, outcomes, and mortality of reintubation after anterior cervical fusion. Spine. 2014;39:134–9.
7. Tillquist MN, Gabriel RA, Dutton RP, Urman RD. Incidence and risk factors for early postoperative reintubations. J. Clin. Anesth. 2016;31:80–9.
8. Canet J, Mazo V. Postoperative pulmonary complications. Minerva Anestesiol. 2010;76:138–43.
9. Lawrence VA, Cornell JE, Smetana GW. American College of Physicians. Strategies to reduce postoperative pulmonary complications after noncardiotho¬racic surgery: systematic review for the American College of Physicians. Ann Intern Med. 2006;8:596–608.
10. McAlister FA, Khan NA, Straus SE, Papaioakim M, Fisher BW, Majumdar SR, et al. Accuracy of the preoperative assess¬ment in predicting pulmonary risk after nonthoracic surgery. Am J Respir Crit Care Med. 2003;5:741–4.
11. Tusman G, Böhm SH, Warner DO, Sprung J. Atelectasis and perioperative pul¬monary complications in high-risk patients. Curr Opin Anaesthesiol. 2012;1:1–10.
12. Kindgen-Milles D, Müller E, Buhl R, Böhner H, Ritter D, Sandmann W, et al. Nasal-continuous positive airway pressure reduces pulmonary morbidity and length of hospital stay following tho-racoabdominal aortic surgery. Chest. 2005;2:821–8.

This paper has been checked for language accuracy by JOSAM editors.
The National Library of Medicine (NLM) citation style guide has been used in this paper.

Suggested citation: Patrias K. Citing medicine: the NLM style guide for authors, editors, and publishers [Internet]. 2nd ed. Wendling DL, technical editor. Bethesda (MD): National Library of Medicine (US); 2007-[updated 2015 Oct 2; cited Year Month Day]. Available from: http://www.nlm.nih.gov/citingmedicine