Retrospective Analysis of Patients Who Underwent Larynx Biopsy: Three-year Results In The Post-Anesthesia Care Unit

Larinks Biyopsisi Yapılan Hastaların Retrospektif Analizi: Anestezi Sonrası Bakım Ünitesinde Üç Yıllık Sonuçlar

Ulku INCE, Hanife KARAKAYA KABUKCU, Zeki ERTUG

Akdeniz University Faculty of Medicine, Anesthesiology and Reanimation, Antalya, Turkey

Yazışma Adresi
Correspondence Address

Hanife Karakaya KABUKCU
Akdeniz University Faculty of Medicine, Anesthesiology and Reanimation, Antalya, Turkey

hanifekabukcu@akdeniz.edu.tr

Geliş tarihi / Received : Eyl 17, 2020
Kabul tarihi / Accepted : Ara 31, 2020
Elektronik yayın tarihi : Eyl 01, 2021
Online published

Bu makalede yapılacak atıf:
Cite this article as:
İnce U, Karakaya Kabukcu H, Ertug Z.
Retrospective Analysis of Patients Who Underwent Larynx Biopsy: Three-year Results In The Post-Anesthesia Care Unit

Akd Tıp D / 2021; 7(3):362-365

Ulku INCE
ORCID ID: 0000-0001-5517-1489
Hanife KARAKAYA KABUKCU
ORCID ID: 0000-0002-9626-139X
Zeki ERTUG
ORCID ID: 0000-0003-4839-7759

ABSTRACT

Introduction:

Direct laryngoscopy is a procedure which is used for both making a diagnosis and taking a biopsy specimen, in patients with larynx pathology. All patients who have undergone airway examination and surgery are at risk for postoperative respiratory complications and require close follow up. For this reason, in our center, such patients are followed-up in Post Anesthesia Care Unit (PACU) post-operatively for close follow-up and treatment.

Material and Methods: The data of 406 patients who have undergone direct laryngoscopy and suspension biopsy procedures and followed-up in PACU, were examined retrospectively. The time until extubation, total time spent in the PACU, analgesic, sedative and any additional medication requirements were recorded. Patients were observed for complications. Descriptive statistics, Student T-test and Friedman Test were applied.

Results:

The records of 406 patients who have undergone direct laryngoscopy and suspension biopsy procedures and admitted to PACU post-operatively in a 3 year time period were reviewed. Of all the patients, 333 were male and 73 were female. We found that time until extubation was 91 ± 45 minutes and total time spent in PACU was 186 ± 77 minutes. There was no statistically significant difference in the systolic, diastolic, and mean arterial pressure, oxygen saturation, and heart rates of patients during the PACU follow-up (p:0.12, p:0.27, p:0.17, p:0,41, p:0,07; respectively). During the PACU follow-up 7 patients have experienced complications and 8 patients had a prolonged PACU stay because of airway edema [total 15 patient (3, 69 %)].

Conclusion:

We think that admittance and follow up in the PACU, in the early post-operative period for patients who undergone upper airway surgery is useful.

Key words: Anesthesia, Post-Anesthesia Care Unit, Larynx Biopsy

ÖZ

Giriş:

Direk laringoskopi yöntemi, larinks patolojisi olan hastalara hem tanı koyabilmek hem de biyopsi alabilmek amacıyla uygulanan bir yöntemdir. Havayolu muayenesi ve cerrahisi geçiren tüm hastalar postoperatif solunum yolu komplikasyonları açısından risk altındadır ve yakın izlem gerektirmektedir. Bu nedenle hastanemizde bu hastalar yakın takip ve tedavi amacıyla Anestezi Sonrası Bakım Ünitesinde (ASBÜ) izlenmektedir.

DOI: 10.53394/akd.979395

Gereç ve Yöntemler:
Direk laringoskopi ve süspansiyon biyopsisi yapılan ve ameliyat sonrası, ASBÜ'de izlenen 406 hastanın verisi retrospektif olarak incelendi. Hastaların entübe ve ASBÜ'de kalış süreleri, analjezik ve sedatif ve ek ilaç gereksinimleri kaydedildi. Komplikasyonlar açısından hastalar izlendi. Verilerin analizinde tanımlayıcı istatistikler , Student T test ve friedman testi kullanılmıştır.

Bulgular:
Üç yıllık sürede direk laringoskopi ve süspansiyon biyopsi yapılan 406 hastanın postoperatif ASBÜ deki takiplerini retrospektif olarak incelendi. Tüm hastaların 333'ü erkek ve 73'ü kadındı. Hastaların entübe takip süresinin 91 ± 45 dk ve ASBÜ takip süresinin 186 ± 77 dk olduğu saptandı. ASBÜ takibi sırasında hastaların sistolik, diyastolik ve ortalama arter basıncı, oksijen satürasyonu ve kalp hızlarında istatistiksel olarak anlamlı bir fark yoktu (sırasıyla; p:0.12, p:0.27, p:0.17, p:0,41, p:0,07).İzlem süresince 7 hastada komplikasyon gelişti ve 8 hastada operasyon bölgesinde oluşan ödem nedeniyle uzun süre entübe takip edildi [15 hasta (%3,9)].

Sonuç:
Hava yolu cerrahisi geçiren hastaların postoperatif erken dönemde ASBÜ takibinin yararlı olacağı görüşündeyiz.

Anahtar sözcükler: Anestezi, Anestezi Sonrası Bakım Ünitesi, Larinks Biyopsisi,

INTRODUCTION

The direct laryngoscopy is a procedure which is used for both making a diagnosis and taking a biopsy specimen, in patients with larynx pathology (1, 2). Direct laryngoscopy is performed following the intubation of patients under general anesthesia by positioning the head to the extension and by the placement of a laryngoscope by a surgeon. In this way direct laryngoscopy is a process that allows evaluation of vocal cords. All patients who have undergone an airway examination and surgery are at risk of postoperative respiratory tract complications and require a close follow-up (3, 4).
Therefore, this group of patients is taken as being postoperative intubated and sedated to the Post Anesthesia Care Unit (PACU) in our hospital, and they are followed-up here. In this study, the PACU follow-ups of patients with laryngeal pathology, who had undergone direct laryngoscopy and suspension biopsy performed by the otorhinolaryngology surgeon department of our hospital, were examined.

MATERIAL AND METHOD

The data of 406 patients, who had undergone direct laryngoscopy and suspension biopsy performed by the otorhinolaryngology surgeon department at Akdeniz University Medical Faculty Hospital between 16.12.2014 and 25.09.2017 and were followed-up in the PACU in the postoperative period, were examined retrospectively. The Ethics Committee (Akdeniz University 70904504/117, 2018) approval was received for the study. The study was carried out according to the principles of the Declaration of Helsinki. Informed consent was not obtained from the patients. The patients' age, gender, co morbidities, preoperative diagnosis, the presence of intubation difficulty, postoperative intubation time, and length of stay in the PACU were recorded. Fentanyl, propofol, and midazolam doses used for postoperative sedation and analgesia and whether antihypertensive or inotropic agents were used were recorded. Furthermore, the use of medications other than standard treatment (mucolytic, H2 receptor antagonist, antibiotic and non-steroid anti-inflammatory agent, bronchodilator agent) applied to patients who had undergone direct laryngoscopy and suspension biopsy in the PACU and the total amount of fluids given were recorded. Moreover, the systolic, diastolic, and mean arterial pressure, oxygen saturation, and heart rates of patients were also recorded on admission to the PACU, after extubation, and before discharge from the PACU. It was also investigated whether there were any complications in the PACU and whether the patients were transferred to the intensive care unit.

Statistical Analysis

The patient data were analyzed using the IBM SPSS Statistics 18 © Copyright SPSS Inc. 1989, 2010 program package. Descriptive statistics, Student T-test and Friedman Test were applied.

RESULTS

333 (82%) of the patients were male, and 73 (18%) were female, and the average age was determined as 56.3±12 years. Diabetes mellitus was present in 20 patients (4.9%), hypertension in 50 patients (12.3%), asthma/chronic obstructive pulmonary disease in 23 patients (5.7%), and other diseases were present in 48 patients (11.8%). 41 patients (10.1%) underwent septoplasty, conchaplasty, functional endoscopic sinus surgery, and tracheotomy, in addition to suspension biopsy. Intubation difficulty was detected in 12 (3%) patients. 16 patients underwent tracheotomy during the operation, and other 10 patients were taken to the operation room with preoperative tracheotomy. Two patients were operated by the robotic surgery.
The intubation follow-up duration of the patients included in the study was found to be 91 ± 45 min, and the PACU follow-up duration was 186 ± 77 min (Table I). It was found out that the intubation time of patients with intubation difficulty was longer (p: 0.048). 8 patients were followed up with intubation for a long period due to hemorrhage and edema in the surgical site. The mean intubation times, PACU follow-up durations, doses of the medications used, and the total amount of fluid given to these patients were included in the statistics.

Table I. Follow-up durations in the Post Anesthesia Care Unit

Intubation follow-up duration (min) (N:367)	PACU follow-up duration (min) (N:398)
91.1 ±45.9	186±77.7

Mean ± standard deviation

During the PACU follow-up, 180 ± 169 µg of fentanyl, 72 ± 44 mg of propofol, and 0.5 ± 1.5 mg of midazolam were administered to patients. During the PACU follow-up, 350 ± 196 ml of isotonic infusion was administered to patients (Table II).

Table II. Sedative medications used in the Post Anesthesia Care Unit and the amount of fluids given

Fentanyl (µgr)	Propofol (mg)	Midazolam (mg)	Total fluid (mL)	Number of patients
180.2±169.7	72.6±44.6	0.5±1.4	350.8±196.8	398

Mean ± standard deviation

The arterial pressure of 33 patients (8.1%) was monitored by invasive arterial monitoring, and the arterial pressure of 373 (91.9%) patients was monitored noninvasively. There was no statistically significant difference in the systolic, diastolic, and mean arterial pressure, oxygen saturation, and heart rates of patients during the PACU follow-up (p:0.12, p:0.27, p:0.17, p:0,41, p:0,07; respectively) (Table III).

Table III. Blood pressure, heart rate and oxygen saturation values of patients in the Post Anesthesia Care Unit

	SAP mmHg	DAP mmHg mmHg	MAP mmHg mmHg	HR beat/min	SPO2%
On admission	125± 29	80±16	96±17	72±42	99±4
After extubation	131±21	79±12	97±14	76±14	98±1
Before discharge	126±19	76±11	94±13	79±31	98±2
p	0.12	0.27	0.17	0.07	0.41

Mean ± standard deviation p<0.05*
SBP; systolic arterial pressure, DBP; diastolic arterial pressure, MAP; mean arterial pressure, SPO2; peripheral oxygen saturation, HR; heart rate

Nitroglycerin was administered to a patient. Ephedrine was administered to a patient due to hypotension.
Furosemide, sugammadex, neuromuscular blocker agent, steroid, atropine, ACE inhibitor, pheniramine hydrogen maleate, and tranexamic acid were administered according to the indication to 120 patients (29.6%), except for the medications they used routinely (mucolytic, H2 receptor antagonist, antibiotic and non-steroid anti-inflammatory agent, bronchodilator agent).
During the PACU follow-up, complications developed in 7 patients. One patient underwent unintended extubation, and the tube was blocked in one patient, and the patients were reintubated. One patient had hemorrhage, and 1 unit of erythrocyte suspension was administered to him. Due to the development of hypotension in 2 patients, one of them was administered with ephedrine, and the other one was administered with 500 ml of voluven infusion. Bradycardia developed in one patient, and he was administered with atropine. Furosemide was administered to one of the patients due to the low urine output. There were no patients transferred to the intensive care unit. It was observed that there was no association with the intubation time of patients undergoing septoplasty, conchaplasty, functional endoscopic sinus surgery in addition to suspension biopsy in the same operation and of patients with asthma/chronic obstructive pulmonary disease. p (0.23, 0.64), respectively.

DISCUSSION

Patients with hoarseness, vocal cord weakness, shortness of breath, complaints of neck pain or mass, and considered to have laryngeal pathology apply to the Ear, Nose and Throat (ENT) polyclinic. These pathologies are laryngeal masses, inflammations, trauma, congenital anomalies, neurological disorders, and malignancies (1, 5). Direct laryngoscopy should be performed both to make a diagnosis and to perform treatment and take a biopsy in both patients with laryngeal pathology and patients who cannot be diagnosed (6). In our hospital, direct laryngoscopy is performed following the intubation of a patient under general anesthesia by bringing the head to the extension position and by the placement of a laryngoscope by a surgeon. Vocal cords should be observed before the laryngoscope is fixed. Then, all structures are examined from top to bottom under the microscope, and incisional or excisional biopsy is taken according to the pathology to be surgically intervened, and it is sent to the pathology laboratory under sterile conditions. Respiratory complications may develop due to airway edema in patients who have undergone a procedure in the larynx or vocal cords (3, 7, and 8).
Laryngeal edema is defined as edema in mucosa occurring as a result of inflammation in vocal cords, vocal bands, arytenoids, epiglottis, and subglottic region. It is life-threatening due to the narrowness in the airway. Laryngeal edema is a common complication of intubation and is associated with laryngeal trauma (7, 8). Post-extubation airway obstruction and post-extubation laryngeal dyspnea, which are usually secondary to laryngeal edema, are among the major causes of post-extubation respiratory distress (9). Edema causes a decrease in the size of the laryngeal lumen and leads to post-extubation stridor or respiratory distress. As a result, post-extubation laryngeal edema may cause respiratory distress, and then, it will require reintubation. Since reintubation is associated with increased morbidity and mortality, it is important to prevent reintubation if possible (9). Therefore, patients who are operated due to laryngeal biopsy in our hospital are followed-up in the PACU for a close follow-up.
Since we have not found any studies conducted on these centers in the literature, we could not discuss the results of the present study with the literature.
The PACU is a center in our hospital to which only postoperative patients are admitted and are followed-up with a mechanical ventilator and monitor, and which is located in the operating room since there is a high risk of reoperation of patients when necessary. After being taken to the PACU after the operation, patients getting above 9 in the ALDRETE's scoring

system (a scoring system evaluating activity, respiration, circulation, consciousness and O2 saturation) are discharged from the PACU to the Ear, Nose and Throat Clinic.

In this study, respiratory and hemodynamic complications developed in 7 out of 406 patients who had undergone suspension biopsy due to laryngeal pathology throughout the PACU follow-up duration. Taking into consideration also the 8 patients who were intubated and followed-up for a long time due to postoperative edema and hemorrhage, it was observed that complications developed in a total of 15 patients (3.69%).

CONCLUSION

In the PACU, following short surgical interventions involving the airway, it is ensured that a patient wakes up more comfortably in the early postoperative period, medication treatment is regulated, analgesia is provided, and hypothermia is prevented. Furthermore, possible respiratory and hemodynamic complications are intervened early. Therefore, it is considered that the PACU follow-up will be beneficial for this group of patients.

Ethics Committee Approval:

The Ethics Committee approval was received for the study.

Informed Consent:

It was not obtained.

Peer-review:

Externally peer-reviewed.

Author Contributions: Concept – H.K.K.; Design - H.K.K.; Supervision - H.K.K.,Z.E.; Resources –H.K.K.,U.I.; Materials – Z.E.; Data Collection and/or Processing - H.K.K.,U.I.; Analysis and/or Interpretation - H.K.K.,U.I.; Literature Search - H.K.K.,U.I.; Writing - H.K.K.,U.I.; Manuscript - H.K.K.; Critical Review - H.K.K.,Z.E.;

Conflict of Interest:

The authors have no conflict of interest to declare.

Financial Disclosure:

The authors declared that this study has received no financial support.

REFERENCES

1. Aydın Ö, Üstündağ E, Güngör A. Larenks Kanserlerinde Tümör Yayılımının Rijit Endoskoplarla Değerlendirilmesi. Türk Otolarengoloji Arşivi 2002; 40: 185-88.
2. Xu S, Yu Y, ElHakim H, Cui X, Yang H. The Therapeutic Effect of the Combination of Intratumor Injection of Bleomycin and Electroresection/Electrocautery on the Hemangiomas in Hypopharynx and Larynx Through Suspension Laryngoscopy. Ann Otol Rhinol Laryngol. 2019; 128:575-80.
3- Yang Y, Wu HT. Lin Chung Er Bi Yan Hou Tou Jing Wai Ke Za Zhi. Clinical and pathological analysis of 1116 cases of vocal cord polyp. 2016; 30:1187-90.
4. Li JJ, Chen WX, Zhu ZF, Zhang JL, He FY, Wang YJ. Prospective study of risk factors of difficult laryngeal exposure in suspension laryngoscopy. Lin Chung Er Bi Yan Hou Tou Jing Wai Ke Za Zhi. 2017; 31:520-3.
5. Ballenger JJ, Snow JB Jr. Otolaryngology - Head and Neck Surgery. (Version: Doğan Şenocak 15. edition). Volume 2., 1996; 1200-08.
6. Richtsmeier WJ, Scher RL. Telescopic laryngeal and pharyngeal surgery. Ann Otol Rhinol Laryngol 1997; 106: 995-1001.
7. Colice GL, Stukel TA, Dain B. Laryngeal complications of prolonged intubation. Chest. 1989; 96:877–84.
8. De Bast Y, De Backer D, Moraine JJ, Lemaire M, Vandenborght C, Vincent JL. The cuff leak test to predict failure of tracheal extubation for laryngeal edema. Inten sive Care Med. 2002; 28:1267–72.
9. Epstein SK, Ciubotaru RL. Independent effects of etiolo gy of failure and time to reintubation on outcome for patients failing extubation. Am J Respir Crit Care Med 1998; 158:489–93.