

## Bronchoscopic Removal of Broken Endotracheal Tube

Argün KIŞ<sup>a</sup>, İlknur Hatice AKBUDAK<sup>b</sup>

<sup>a</sup>Department of Thoracic Surgery, Pamukkale University Faculty of Medicine, Denizli, TURKEY

<sup>b</sup>Department of Anesthesiology and Reanimation, Pamukkale University Faculty of Medicine, Denizli, TURKEY

**ABSTRACT** A 75 years old male was admitted to thoracic surgery department with a foreign body in the airway. He was mechanically ventilated in the intensive care unit follow-up period. During weaning, when sedative agents were stopped, the endotracheal tube was damaged by patient bite. Suddenly after extubation, it was observed that only the proximal part of the tube was removed. Despite this, the patient was still conscious and breathing spontaneously. The radiological evaluation revealed that the distal part of the tube was lying through the bronchus intermedius from the subglottic region. We report a case of broken and totally separated endotracheal tube which distal part was removed by rigid bronchoscopy.

**Keywords:** Airway obstruction; bronchoscopy; airway extubation

Foreign body aspiration is not common in adults and is usually seen in central nerve system depression, cough reflex impairment, and ingestion dysfunction, mental retardation.<sup>1,2</sup> Tooth extraction operations and traumatic intubations are the leading causes of iatrogenic aspirations.<sup>3,4</sup> While weaning from mechanical ventilation in the intensive care unit or planning extubation after surgery, non-sedated patients can bite endotracheal tube (ETT).<sup>5-7</sup>

ETT damage, airway obstruction, and rarely complete break in two pieces may happen. Occlusion of the ETT by biting on it, compounding to airway obstruction lead to negative pressure pulmonary edema.<sup>8</sup> In rare occasions, the fragmented distal part of ETT would slide down and entirely obstruct the lower airway tract which is a catastrophic life-threatening state. We report a case of complete separated intraoral ETT during extubation.

### CASE REPORT

A 75 years old intubated male who had a cranial tumor history was mechanically ventilated in the intensive care unit. During weaning follow-up period, sedative agents were diminished and interrupted gradually. As soon as ETT was removed, the distal part was detected below the vocal cords through laryngoscopic inspection. The ETT was branched off, and only the proximal portion of the tube was retrieved. After radiological evaluation (Figure 1), the patient was referred to the thoracic surgery department. At the initial assessment, he was awake and well-oriented. Glasgow coma score was 15, the patient was tachycardic (110 bpm), tachypneic (25 breaths per minute), and had inspiratory stridor. Oxygen saturation decreased after anesthesia administration, which was %90 previously. The patient was intubated rapidly with rigid bronchoscopy; the distal part of ETT was placed below the

**Correspondence:** Argün KIŞ

Department of Thoracic Surgery, Pamukkale University Faculty of Medicine, Denizli, TURKEY

**E-mail:** argunkis@yahoo.com



Peer review under responsibility of Türkiye Klinikleri Journal of Case Reports.

**Received:** 07 Dec 2020

**Received in revised form:** 21 Jan 2021

**Accepted:** 25 Jan 2021

**Available online:** 22 Feb 2021

2147-9291 / Copyright © 2021 by Türkiye Klinikleri. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

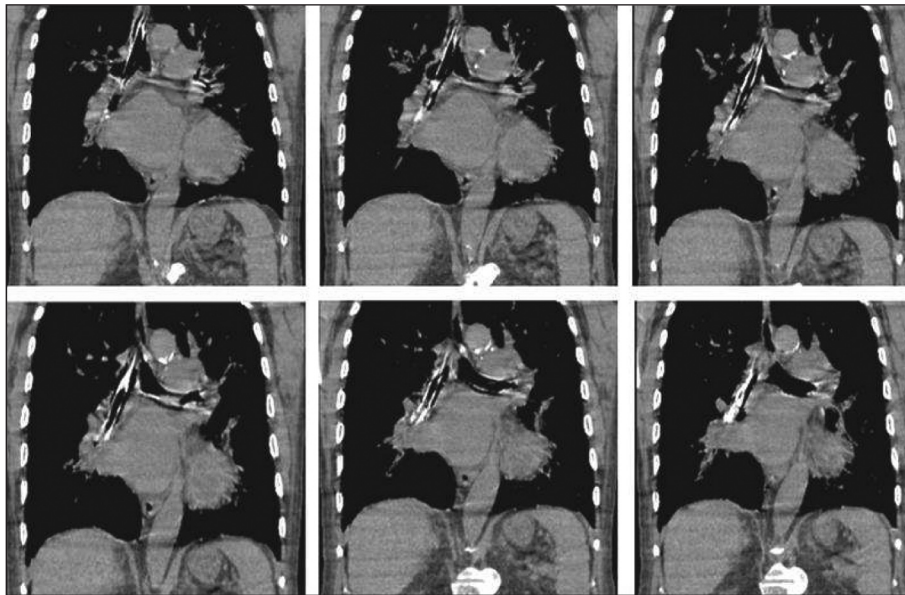


FIGURE 1: Computed tomography scans show that distal part of broken endotracheal tube was placed from subglottic region to bronchus intermedius.



FIGURE 2: Bronchoscopic view of the broken endotracheal tube located in subglottic area and images after removal.

vocal cords and removed by forceps subsequently. It was partially obstructed by bloody sputum (Figure 2). The postoperative course was uneventful.

Written informed consent was obtained from the patient.

## DISCUSSION

Although ETT completely occupied trachea and right main bronchus, the patient was breathing spontaneously, because the luminal shape of ETT and location in the respiratory tract allows the air pass through

it. Fortunately, ETT was not totally occluded with secretion, in such a case, it would not have been possible to perform intubation or tracheostomy. Rigid bronchoscopy was applied rapidly when face mask ventilation was insufficient; subsequently, distal part was retracted out to secure the airway patency. Therapeutic intraoral equipments, medical interventions, and surgeries associated with the oral cavity or respiratory system are potential risk for iatrogenic foreign body aspiration.<sup>9-11</sup> Fracture following bite of the patient is a potential risk even for reinforced ETT.<sup>12-14</sup> Although bite block is recommended to avoid bite damage, it is not a definitive solution.<sup>15</sup> Especially when sedation is diminished or interrupted, ETT related complications are observed more often. Death can occur after complete obstruction or irritation edema of the upper airway. ETT should be examined whether damaged or not in case of sudden desaturation of the patient or air leak detection during ventilation.

This is a unique case in literature that required bronchoscopic intervention to pull up the distal part of ETT from the subglottic region.

### Source of Finance

*During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct con-*

nection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

### Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise,

working conditions, share holding and similar situations in any firm.

### Authorship Contributions

**Idea/Concept:** Argün KİŞ; **Control/Supervision:** Argün KİŞ; **Analysis and/or Interpretation:** Argün KİŞ; **Literature Review:** İlknur Hatice Akbudak; **Writing the Article:** Argün KİŞ; **Critical Review:** İlknur Hatice Akbudak.

## REFERENCES

- Hewlett JC, Rickman OB, Lentz RJ, Prakash UB, Maldonado F. Foreign body aspiration in adult airways: therapeutic approach. *J Thorac Dis.* 2017;9(9):3398-409. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Lin L, Lv L, Wang Y, Zha X, Tang F, Liu X. The clinical features of foreign body aspiration into the lower airway in geriatric patients. *Clin Interv Aging.* 2014;9:1613-8. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Pugach IZ, Pugach S. Aspiration of extracted tooth under general anesthesia. *Case Rep Imag Surg.* 2018;1(1):1-2. [[Crossref](#)]
- Dhadge ND. Tooth aspiration following emergency endotracheal intubation. *Respir Med Case Rep.* 2016;18:85-6. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Ozgur M. Unexpected desaturation with occlusion due to biting in a deformed endotracheal tube in an intensive care patient. *Van Tıp Derg.* 2016;23(1):142. [[Crossref](#)]
- Duma A, Novak K, Schramm W. Tube-in-tube emergency airway management after a bitten endotracheal tube caused by repetitive transcranial electrical stimulation during spinal cord surgery. *Anesthesiology.* 2009;111(5):1155-7. [[Crossref](#)] [[PubMed](#)]
- Eisenach JH, Barnes RD. Potential disaster in airway management: a misguided airway exchange catheter via a hole bitten into a uni-vent endotracheal tube. *Anesthesiology.* 2002;96(5):1266-8. [[Crossref](#)] [[PubMed](#)]
- Pawar SC, Kulkarni JA, Jagtap SR, Patil SS. Perioperative crisis management: negative pressure pulmonary edema after violent hiccups at emergence and endotracheal tube occlusion caused by biting. *The Internet Journal of Anesthesiology.* 2009;25(1):1-5. [[Crossref](#)]
- Jain A, Naithani M, Chaudhary Z, Sharma P. Rare iatrogenic airway foreign body: The rivet from the fulcrum of the McCoy laryngoscope blade. *Indian J Anaesth.* 2012;56(3):301-2. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Singh S, Mishra A. Iatrogenic foreign body during extraction. *Otolaryngol (Sunnyvale).* 2015;5(3):194. [[Link](#)]
- Dhar V, Al-Reefy H, Dilkes M. Case report--an iatrogenic foreign body in the airway. *Int J Surg.* 2008;6(6):e46-7. [[Crossref](#)] [[PubMed](#)]
- Jain R, Sethi N, Sood J. Loss of integrity of a reinforced endotracheal tube by patient bite. *Indian J Anaesth.* 2013;57(4):424. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Sekerci S, Bilgin S, Taştan S. Endotracheal tube breakage during extubation. *Eur J Anaesthesiol.* 1997;14(2):201-2. [[PubMed](#)]
- Rodríguez R, González H, Carranza A. Intraoral separation of a reinforced endotracheal tube. *Anesthesiology.* 2000;93(3):908. [[Crossref](#)] [[PubMed](#)]
- Kandasamy R, Sivalingam P. Endotracheal tube damage in the presence of bite block. *Anesthesiology.* 1999;90(2):637. [[Crossref](#)] [[PubMed](#)]