



# Our Unpredicted Difficult Airway Experience in Tracheobronchopathia Osteochondroplastica Patient: A Case Report

## Trakeobronkopatia Osteokondroplastika Hastasında Öngörülemeyen Zor Hava Yolu Deneyimimiz: Olgu Sunumu

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### ABSTRACT

Difficult airway is a serious condition that can be fatal and is frequently encountered during general anesthesia applications. Tracheobronchopathy osteochondroplasty (TBO) is a rare benign disease that is one of the causes of unpredictable difficult airway. A 45-year-old male patient with no comorbidities was transferred to the operating room for elective cholecystectomy. He couldn't be intubated after standard monitoring and induction of anesthesia. The patient, who had papillomatous lesions in the trachea detected by bronchoscopy, was awakened to be scheduled for rigid bronchoscopy. TBO was detected in pathological examination of the samples taken in rigid bronchoscopy. TBO is a rare benign disease. Its etiology is unknown. It may be asymptomatic or may present with persistent dry cough, hemoptysis, dyspnea, recurrent lower respiratory tract infection, atelectasis and difficult intubation. Some patients may be diagnosed for the first time in the operating room due to difficult intubation. In cases with advanced tracheal stenosis, invasive airway intervention may be required or it may have a fatal course. The use of a laryngeal mask in the perioperative period may be an ideal option in a patient known to have TBO before. Unexpected difficult airway management in the operating room is important for anesthesiologists. According to the difficult airway society algorithm, waking the patient from a planned operation is the safest way until the problem is detected. We did not need invasive intervention because our patient also had elective

### ÖZ

Zor hava yolu genel anestezi uygulamaları sırasında sık karşılaşılan ölümcül seyredabilen ciddi bir durumdur. Trakeobronkopatia osteokondroplastika (TBO), öngörülemeyen zor hava yolu nedenlerinden biri olan nadir görülen iyi huylu bir hastalıktır. Kırk beş yaşında ek hastalığı olmayan erkek hasta elektif kolesistektomi ameliyatı için ameliyathaneye alındı. Standart monitörizasyon ve anestezi indüksiyonu sonrası entübe edilemedi. Bronkoskopi ile trakeada papillomatöz lezyonlar görülen hasta rijid bronkoskopi planlamak üzere uyandırıldı. Rijid bronkoskopide alınan örneklerin patolojik incelemesinde TBO saptandı. TBO nadir görülen benign bir hastalıktır. Etiyolojisi bilinmemektedir. Asemptomatik olabilir ya da inatçı kuru öksürük, hemoptizi, nefes darlığı, tekrarlayan alt solunum yolu enfeksiyonu, atelettazi ve zor entübasyon görülebilir. Bazı hastaların tanısı ilk kez zor entübasyon nedeniyle ameliyathanede koyulabilir. İleri derecede trakeal darlığı olan olgularda invaziv hava yolu girişimi gerekebilir ya da mortal seyredebilir. Önceden TBO olduğu bilinen bir hastada perioperatif dönemde laringeal maske kullanımı ideal bir seçenek olabilir. Ameliyathanede beklenmedik zor hava yolu yönetimi anestezi uzmanları için önemlidir. Zor hava yolu derneği algoritmasına göre hastayı planlı bir operasyondan uyandırmak sorun tespit edilene kadar en güvenli yoldur. Bizim hastamızın da elektif cerrahi olması ve ventilasyonunun zor olmaması nedeniyle invaziv girişime gerek duymadık. Ayrıca ameliyathane şartlarında fiberoptik bronkoskopi

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**ABSTRACT**

surgery and ventilation was not difficult. In addition, we think that it is an important decision to make a diagnosis using fiberoptic bronchoscopy in operating room conditions and to wake up our patient with sugammadex without repeated attempts of tracheal intubation and delay elective surgery. In conclusion, it should be kept in mind that TBO may be one of the unpredictable causes of difficult intubation in the operating room.

**Keywords:** Traceobroncopatia osteochondroplastica, difficult airway, fiberoptic bronchoscopy

**ÖZ**

kullanarak tanı koymamız ve reentübasyon denemelerinde bulunmadan hastamızı sugammadex ile uyandırarak elektif cerrahiye ertelememizin önemli bir karar olduğunu düşünmekteyiz. Sonuç olarak nadir görülmekle birlikte TBO ameliyathane, yoğun bakım ve acil servislerde öngörülemeyen zor entübasyon nedenlerinden biri olarak akılda tutulmalıdır.

**Anahtar Sözcükler:** Trakeobronkopatia osteokondroplastika, zor hava yolu, fiberoptik bronkoskop

**Introduction**

Difficult airway is a serious condition that is frequently encountered during general anesthesia and can be fatal. According to the analysis of Difficult Airway Society (DAS) 2016-2021 data, it was stated that 50% of difficult airway events were unexpected (1).

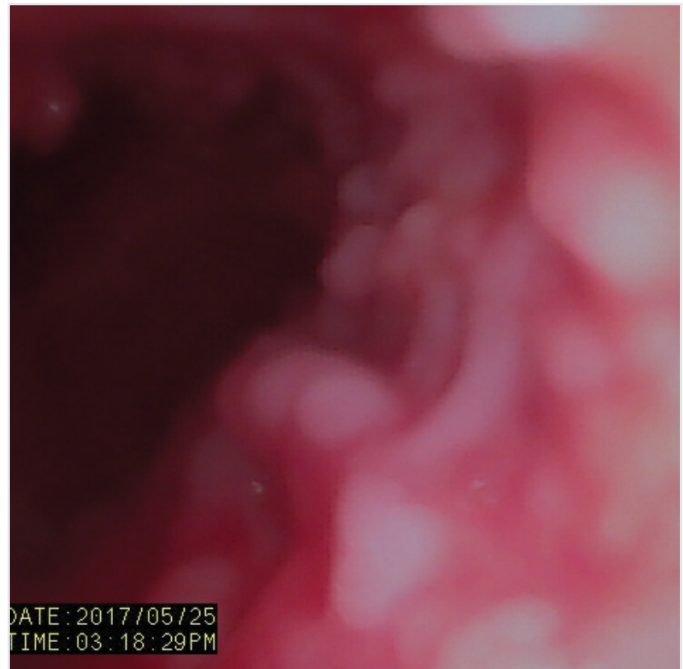
Tracheobronkopathy osteochondroplasty (TBO) is a disease characterized by the protrusion of submucosal nodules originating from bone and cartilage tissue in the tracheobronchial wall into the lumen. Nodules can cause stenosis and complete obstruction over time (2). It was first encountered in 1,875 by Wilks in the autopsy of a patient who died due to tuberculosis. Its etiology is unknown (3).

We aimed to present a patient with TBO, one of the rare causes of unpredictable difficult airway, who we detected in our clinic, in the light of the literature.

**Case Report**

A 45-year-old male patient was transferred to the operating room for laparoscopic cholecystectomy due to cholelithiasis. He had no additional disease in his medical history. The American Society of Anesthesiology score was evaluated as 1. There was no history of previous surgery. There were no findings on physical examination that would suggest a difficult airway. In preoperative evaluation, sternomental distance, thyromental distance and mouth opening, which were among the parameters we used to predict the possibility of a difficult airway, were evaluated as normal. Mallampati score 2 was calculated. Standard monitoring was applied to the patient (non-invasive blood pressure, SpO<sub>2</sub>, ECG). After premedication was provided with 0.01 mg/kg iv midazolam, 1 mg/kg iv lidocaine, 2 mg/kg iv propofol and 1 mcg/kg iv fentanyl were administered for anesthesia induction. After effective ventilation was achieved with a mask, 0.6 mg/kg rocuronium was administered iv. Mask ventilation was continued for 2 minutes to ensure the muscle relaxant effect. It was detected as Cormack Lehane Class 1 on direct laryngoscopy. Orotracheal intubation was attempted with a size 8.0 endotracheal tube (ETT). After the vocal cords were passed, the ETT could not be pushed forward. Then, orotracheal intubation was tried by the specialist anesthesiologist with ETT numbers 7.0, 6.0 and 5.0, respectively. However,

ETT could not be pushed forward again after passing the vocal cords. It was determined that the ETT could not be pushed forward due to resistance at the level just below the vocal cords. After mask ventilation with 100% oxygen for 3 minutes, the vocal cords were passed and the tracheal lumen was visualized using a 2.8 mm inner diameter and 3.7 mm outer diameter pediatric fiberoptic bronchoscopy. Diffuse nodular lesions protruding inward, narrowing the lumen, were observed on the tracheal wall (Figures 1, 2). Intubation attempts were not repeated to avoid complications such as edema and bleeding in the narrowed lumen. The patient was consulted to the thoracic surgery clinic during the procedure, and it was decided to wake him up to plan a rigid bronchoscopy at a later date under elective conditions. After 4 mg/kg sugammadex was administered iv to reverse the neuromuscular blockade, the patient, whose muscle activity fully returned, was transferred to the post-anesthesia care unit. The patient, whose SpO<sub>2</sub> level was around 90% and had intercostal retractions during follow-up, was



**Figure 1.** Multiple nodules protruding into the tracheal lumen

administered 1 mg/kg iv prednisolone, inhaler bronchodilator and cold steam therapy to prevent edema in the airway and for bronchodilation. The patient, whose SpO<sub>2</sub> in room air was 100% and who had no respiratory distress, was transferred to the ward. The posterior anterior chest radiograph performed before the operation of the patient, who had no respiratory complaints in the preoperative evaluation, was re-evaluated. It was observed that the tracheal lumen was irregularly limited.

Rigid bronchoscopy performed electively revealed many hard papillomatous lesions starting just below the vocal cords and extending to the main bronchi. Lesions narrowing the lumen were excised. By pathological examination of the samples taken, the diagnosis of TBO was made. A cholecystectomy was planned one week after the diagnosis. After routine preoperative monitoring and standard anesthesia induction, intubation was attempted with a size 7 ETT. The patient, whose intubation was successful, was extubated without any problems after the operation and transferred to the ward.

## Discussion

Tracheobronchopathia osteochondroplastica is a rare benign disease. Its etiology is unknown. It may be asymptomatic. Persistent dry cough, hemoptysis, shortness of breath, recurrent lower respiratory tract infection, atelectasis and difficult intubation may occur. The diagnosis of some patients can be made in the operating room due to difficult intubation (2,4). Patients with severe tracheal stenosis may require invasive airway intervention or may have fatal course (5,6). In patients with previously known TBO, the use of a laryngeal mask in the perioperative period may be an ideal option (5). Ishii et al. (5) presented a patient who was to undergo elective



**Figure 2.** Multiple nodules protruding into the tracheal lumen

hepatectomy. They could not push forward the ETT after passing the vocal cords, just like us, and they woke the patient up, thinking that the lesions might be due to malignancy and could lead to bleeding. When the patient underwent surgery again after the diagnosis of TBO was made, they completed the surgery safely using a laryngeal mask when the tube could not be pushed forward (5). Our patient was not previously diagnosed as having TBO and we had no idea about the characteristics of the lesions. Therefore, we did not consider using a laryngeal mask. Since there was a risk of laryngeal edema and bleeding after repeated intubation attempts, we chose to wake our patient.

Warner et al. (4) could not push forward ETT during laryngoscopy in a patient who was to undergo elective prostatectomy, similar to our patient, and they preferred to wake the patient. In the postoperative period, they diagnosed TBO first with CT and then with bronchoscopy. They argued that bronchoscopy would be useful in the diagnosis of TBO and in relieving obstructive symptoms by excising the lesions (4). Based on this, we think that it is important to first visualize papillomas, which are the cause of unexpected difficult airway, using a fiberoptic bronchoscope under operating room conditions, and then to relieve airway access by excising the lesions with planned rigid bronchoscopy.

We would also like to draw attention to the importance of the posterior anterior chest radiography performed in the preoperative evaluation. In our patient, we noticed that the trachea was irregularly bordered by careful retrospective examination. A more careful examination in the preoperative period can prevent unexpected situations.

Unexpected difficult airway management in the operating room is important for anesthesiologists. According to the DAS algorithm, waking the patient from a planned operation is the safest way until the problem is detected (7). As a result of our patient's comfortable mask ventilation, we provided adequate oxygenation and did not require invasive airway intervention. Additionally, since he was going to have an elective planned surgery, we woke our patient as indicated by DAS as safe.

As a result, although TBO is a rare disease, it may cause difficult intubation. Knowledge and experience regarding difficult airway management come to the fore, especially in patients encountered in operating room conditions. We think that our patient will contribute to unexpected difficult airway management.

## Ethics

**Informed Consent:** The patient was asked to sign a voluntary consent form to participate in the case report study, stating that his identity information would not be shared.

**Peer-review:** Externally peer reviewed.

## Authorship Contributions

Surgical and Medical Practices: S.Y., O.C.A., Concept: S.Y., K.K., Design: A.Ş., S.Y., K.K., Data Collection or Processing:

A.Ş., Analysis or Interpretation: A.Ş., S.Y., Literature Search: A.Ş., Writing: A.Ş.

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