

Tracheobronchial Foreign Body Aspirations in Adults; Analysis of Three Years

Erişkinlerde Trakeobronşial Yabancı Cisim Aspirasyonları: Üç Yıllık Analizi

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Abstract: Aspiration of foreign bodies into the tracheobronchial tree is a common health problem in children and rare in adults, although incidence rates increase with advancing age. This study aimed to evaluate the safety and outcome of foreign body removal by rigid bronchoscopy. A retrospective analysis of 3 years (2016-2019) of 20 patients who underwent rigid bronchoscopy for tracheobronchial foreign bodies. A total of 20 patients underwent foreign body removal from the airway with rigid bronchoscopy. The median age of the patients was 50(range, 33-67) years, and 12 (60%) were male. Foreign bodies removed included 19(95%) with rigid bronchoscopy under general anesthesia. The locations of the foreign bodies included the central airway (n = 6; trachea, right bronchial tree (n = 9), and left bronchial tree (n = 5). Successful removal was observed in 19 (95%) cases. One patient underwent thoracotomy because of the failure of the removal with rigid bronchoscopy. Rigid bronchoscopic extraction of a foreign body in the airway under general anesthesia can be performed successfully with minimal complications.

Keywords: Tracheobronchial tree, foreign body, rigid bronchoscopy

Özet: Trakeobronşial yabancı cisim aspirasyonları çocuklarda sık görülen bir sağlık problemi olup erişkinlerde daha az sıklıkta görülmektedir. İlerleyen yaşlarla birlikte aspirasyonlar sıklıkla artmaktadır. Bu çalışma rijid bronkoskopi ile yabancı cisim çıkarılmasının sonuçlarını ve güvenliğini değerlendirmek için yapıldı. Üç yıl içinde (2016-2019) Trakeobronşial yabancı cisim aspirasyonları ile başvuran ve rijid bronkoskopi uygulanan 20 hastanın retrospektif analizleri yapıldı. Yirmi hastanın tamamı yabancı cisim çıkarımı için rijid bronkoskopiye alındı. Hastaların ortalama yaşı 50(33-67 yaş aralığında) ve 12 hasta(%60) erkekti. Yabancı cisim 19 hastada (%95)genel anestezi altında rijid bronkoskopiyle başarıyla çıkarıldı. Yabancı cisimler 9 hastada sağ bronşiyal sistemde, 5 hastada sol bronşiyal sistemde ve 6 hastada trakeada idi. Rijid bronkoskopi ile başarılı çıkartılma işlemi 19 hastada(%95) gerçekleştirildi. Bir hastada rijid bronkoskopi başarılı olmadığından torakotomi uygulanarak çıkartıldı. Hava yollarındaki yabancı cismin çıkartılmasında genel anestezi altında rijid bronkoskopi minimal komplikasyonlar ile başarılı olarak uygulanabilir bir yöntemdir.

Anahtar Kelimeler: Trakeobronşial ağaç, yabancı cisim, rijit bronkoskopi

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Received 10.02.2020

Accepted 20.02.2020

Online published 20.02.2020

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Cite this article as:

Doner E, Tracheobronchial Foreign Body Aspirations in Adults; Analysis of Three Years, Osmangazi Journal of Medicine, 2020;42(6):609-612 **Doi:** 10.20515/otd.687304

1. Introduction

Foreign body aspiration in the airway is a life-threatening medical emergency and requires early intervention. It is frequently seen in childhood but also can be seen in adults. It may lead different symptoms depending to the settlement of foreign body. Foreign body in the airway is rarely seen asymptomatic. This may lead to cough, shortness of breath and may lead to asphyxia with acute respiratory distress syndrome. (1, 2). Delayed diagnosis can cause postobstructive pneumonia, atelectasis, bronchiectasis (3, 4). Bronchoscopic techniques for the removal of foreign bodies is the basic method. Bronchoscopy was used for the first time in 1897 with a rigid bronchoscope for the removal of foreign bodies from the trachea, and since then, rigid bronchoscopic techniques have been in progress and have been widely used for this purpose. Later, with the introduction and spread of flexible bronchoscopy, flexible bronchoscopy has also been used in the removal of foreign bodies (5). Today rigid bronchoscopy is commonly used in the treatment of foreign body aspiration, However, since it requires experience and general anesthesia.

2. Methods

Twenty patients who admitted to Eskişehir Osmangazi University Medicine Faculty Emergency Department with foreign body aspiration history were retrospectively

evaluated. Rigid bronchoscopy (Karl Storz Instruments, Germany) under general anesthesia was performed to all the patients in operation room. If required, distal airways were evaluated with flexible bronchoscopy. Foreign objects detected in the bronchoscopic examination were removed using alligator forceps, grasping forceps, biopsy forceps with rigid bronchoscope under general anesthesia.

3. Results

In the study, 12 of 20 patients (60%) were males, and the average age was 50 years (age range 33–67). In the anamnesis of all cases, there was foreign body aspiration history. The symptoms were cough in 18 patients (90%), dyspnea in 13 patients (65%), chest pain in 2 patients (10%). Eighteen patients were admitted to the hospital in the first 24 hours of aspiration and were intervened. The other 2 patients admitted to our hospital after 24 hours because of evaluation in another hospital emergency clinics. Predisposing factors were detected for aspiration in six patients. Four patients had tracheostomy due to the neck dissection because of the laryngeal carcinoma. Two patients had Alzheimer disease. We observed the foreign body with chest X-ray and computed tomography in 16 patients (80%). The other 4 patients were performed bronchoscopy due to their story of admittance and suspicion of foreign body aspiration.

Table 1. Patient characteristics

Features	Number of patients	%
Gender (M/F)	12/8	60/40
Symptoms		
Cough	18	90
Dyspnea	13	65
Chest pain	2	10
Time of admittance		
Early (<24h)	18	90
Late (>24h)	2	10
Treatment		
Rigid bronchoscopy	19	95
Thoracotomy	1	5

The localization of aspirated foreign bodies in the airway is shown in Table 2. The foreign bodies were detected in the right bronchial system in 9 patients, in the left bronchial in 5 patients, and in the trachea in 6 patients. Four of aspirated foreign bodies (20%) were organic and 16 (80%) were inorganic substances. The most common aspirated foreign body was a needle (in 8 patients, 40%). All eight patients who aspirated needles (scarf pin) were female. The foreign bodies were

successfully removed from the airway with rigid bronchoscopy in 19 patients (95%). One patient underwent right sided posterolateral thoracotomy to remove the foreign body(cherry kernell) in the lateral basal segment of the right lower lobe because of the failure of rigid bronchoscopic removal. Flexible bronchoscopy was performed in this patient also for removal, but we did not succeed.

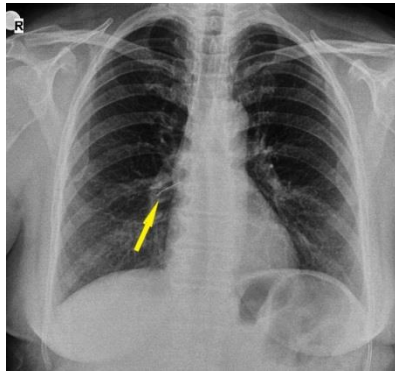


Figure 1. foreign body shown in chest x-ray



Figure 2. foreign body shown in CT

Table 2. Localization of the foreign bodies

Localization	Number of patients
Trachea	6
Right bronchial system	
Right upper lobe	7
Right lower lobe	2
Left bronchial system	
Left main bronchus	5

4. Discussion

Tracheobronchial foreign body aspirations are severe and can result in death, although it can be seen at any age. It is rare in adults than in children. The history is very important in the diagnosis of tracheobronchial foreign body aspiration. . As for foreign body aspiration seen in adults, airway protective mechanisms are often insufficient. Alcoholism, drug addiction, mental retardation and neuromuscular diseases are predisposing factors. The most common complaint is cough. Cough is initially spasmodic, dry, irritative and it comes in seizures, after the foreign body is placed in the bronchus, (4) Cough is observed in 59-82.5% of patients.

In our study, 90% of cases there was a cough. Eighteen of our patients admitted to our hospital on the same day

Any suspect from foreign body aspiration radiological examinations should be made to the cases.If the foreign body is radiopaque, it can be easily seen with chest X-ray. But to define the localization precisely and the largest dimension of the object lateral and oblique lung radiographs should also be taken to see. (6) A normal chest radiograph of a foreign body does not indicate absence, bronchoscopy should be performed if suspicion continues. However, organic materials are not visible because they are

radiolucent and can lead to indirect findings (atelectasis, pneumonia, obstructive emphysema, mediastinal shift, etc.) depending on the degree of obstruction. Computed thorax tomography (CT) is more sensitive than chest x-ray and specific CT can detect especially lower attenuation intrabronchial material and frequently can show us the obstruction level (7). In our study radiologic findings were found in 16 patients. The most common radiological finding was a radiopaque foreign body image with a rate of 80%. The reason for this high rate was that the needles were high among the aspirated foreign bodies.

Tracheobronchial foreign body aspirations are generally seen in the right bronchial system because the right bronchus is shorter than the left bronchus, wider and its direction is close to the vertical, that is closer to the direction of the trachea. In our study foreign body was observed in right bronchial system in 9 (45%) patients.

The type and rate of the aspirated foreign body varies from country to country according to the customs and traditions of the people age, gender, profession, cultural life, diet and

socio-economic situation, The majority of foreign body aspirations in non-industrialized countries is most dried nuts with organic foreign bodies and forming shells (pistachio, nut shells, etc.),The incidence of plastic foreign body aspiration has increased more in industrialized countries in recent years (8).

Due to diagnostic delay, if any foreign body stays in the lung for a long time, bronchiectasis, obstructive emphysema, recurrent pneumonia, bronchial stenosis, lung abscess, pleural effusion, empyema, bronchopleural fistula may develop. In the early period, foreign body aspiration can manifest itself with complications such as acute dyspnea, asphyxia, hemoptysis, pneumothorax, laryngeal edema, and cardiac arrest. [9,10] To exclude tracheobronchial foreign body aspiration, bronchoscopy is absolutely recommended.

In conclusion, Bronchoscopy should be used as a diagnostic and therapeutic tool and is the gold standard with anamnesis, clinical and radiological findings in cases with suspected foreign body aspiration.

REFERENCES

1. Rafanan AL, Mehta AC. Adult airway foreign body removal. What's new? *Clin Chest Med* 2001;22:319-30.
2. Baharloo F, Veyckemans F, Francis C, Bietlot MP, Rodenstein DO. Tracheobronchial foreign bodies: presentation and management in children and adults. *Chest* 1999;115:1357-62.
3. Saki N, Nikakhlag S, Rahim F, Abshirini H. Foreign body aspirations in Infancy: a 20-year experience. *Int J Med Sci* 2009;6:322-8.
4. Eroğlu A, Kürkçüoğlu IC, Karaoğlanoğlu N, Yekeler E, Aslan S, Başoğlu A. Tracheobronchial foreign bodies: a 10 year experience. *Ulus Travma Acil Cerrahi Derg* 2003;9:262-6.
5. Gürsu S, Sırmalı M, Gezer S, Fındık G, Türüt H, Aydın E, et al. Yetişkinlerde trakeobronşiyal yabancı cisim aspirasyonları. *Turkish J Thorac Cardiovasc Surg* 2006;14:38-41.
6. Soysal O, Kuzucu A, Ulutaş H. Tracheobronchial foerign bodies aspiration: a continuing challenge. *Otolaryngol Head Neck Surg* 2006;135:223-6.
7. Gandhi R, Jain A, Agarwal R, Vajifdar H. Tracheobronchial foreign bodies-a seven years review. *J Anesth Clin Pharmacology* 2007;23:69-74.
8. Latifi X, Mustafa A, Hysenaj Q. Rigid tracheobronchoscopy in the management of airway foreign bodies: 10 years experience in Kosovo. *Int J Pediatr Otorhinolaryngol* 2006;70:2055-9.
9. Marquette CH, Martinot A. Foreign body removal in adults and children. In: Bolliger CT, ed. *Interventional bronchoscopy*. Basel: S Karger AG 2000:96-107.
10. Cobanoğlu U, Yalçinkaya I. Tracheobronchial foreign body aspirations. *Ulus Travma Acil Cerrahi Derg* 2009;15:493-9.