
An unusual case of foreign body aspiration and review of the literature

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ÖZET

Nadir bir yabancı cisim aspirasyonu ve literatüre bakış

Trakeobronşiyal yabancı cisim aspirasyonları, her yaş grubunda görülebilen, acil tanı ve müdahale gerektiren bir sağlık problemidir. Yabancı cisim aspirasyonlarının hiçbir klinik bulgu olmayabileceği gibi öksürük, nefes darlığı, hemoptizi ve solunumsal arreste varan geniş bir semptom marjı vardır. Yedi yıl önce skuamoz hücreli karsinoma tanısıyla total larenjektomi geçiren 72 yaşındaki erkek olgu, trakeostomi kanülünün nefes borusuna kaçması şikayetiyle acil servise başvurmuştu. Fizik muayene ve akciğer grafisinde hiçbir bulgu saptanamayan olgu; anamnezindeki güvensizlik nedeniyle acil hekimi ve konsülte eden göğüs hastalıkları hekimi tarafından acil müdahale gerekmediği, yanılmış olabileceği söylenerek poliklinik kontrolü önerilerek taburcu edilmişti. Ertesi gün göğüs cerrahisi polikliniğinde fizik muayene ve akciğer grafisi ile değerlendirilen olguda patoloji saptanmadı. Ancak çekilen toraks bilgisayarlı tomografisinde sol ana bronşta bronşun şeklini alan ve obstrüksiyona neden olmayan kanül saptandı. Sedoanaljezi eşliğinde rijid bronkoskopi ile kanül forseps yardımıyla çıkarıldı ve olgu ertesi gün sorunsuz taburcu edildi. Sonuç olarak; etyoloji ve patogenezin bilinmesi olguya yaklaşım zamanı ve şeklini belirlemede yararlıdır. Yabancı cisim şüphesi olan olguda muayene ve akciğer bulguları yeterli olmayabilir, toraks bilgisayarlı tomografi ve tanı konamıyorsa bronkoskopi mutlaka yapılmalıdır. Fleksibl bronkoskopi tanısız amaçlı kullanılabilen, küçük ve uygun yabancı cisimlerin çıkarılmasında öncelikli olmaktadır. Çocuklarda, komplike olgularda, penetran veya amorf şekilli yabancı cisimlerin çıkarılmasında rijid bronkoskopi seçilmelidir.

Anahtar Kelimeler: *Yabancı cisim aspirasyonu, trakeostomi kanülü, fleksibl bronkoskopi, rijid bronkoskopi.*

SUMMARY

An unusual case of foreign body aspiration and review of the literature

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Tracheobronchial foreign body aspiration is a health problem that can be seen in all age groups, and it requires urgent diagnosis and intervention. We report a case of an unusual foreign body aspiration in a laryngectomized patient and we aim to discuss this situation according to the literature. A 72-year-old man, who underwent total laryngectomy 7 years ago for a squamous cell carcinoma of the larynx, was reported with complaint of aspiration of a silicone tracheostomy canula. Foreign body aspiration can present with a wide variety of symptoms. Although it is sometimes asymptomatic, mostly there exists cough, dispnea, hemoptisis and even respiratory arrest. Clinical history and radiological examinations are enough for the diagnose but in some cases, it is difficult to diagnose even by bronchoscopy. In this report, etiology, pathogenesis, clinical presentation, diagnose and treatment of foreign body aspirations are discussed under the light of the literature. Etiology and pathogenesis are beneficial for the assessment of treatment time and method. Appropriate and ontime clinical intervention makes the diagnosis to be easier. Treatment timing and methods are important to prevent the complications. Flexible bronchoscopy can be used for the diagnose and is preferential to remove small and fit foreign bodies. For children, for complicated cases and in order to remove penetrating or amorph-shaped bodies rigit bronchoscopy should be preferred.

Key Words: Foreign body, flexible bronchoscopy, rigit bronchoscopy, tracheostomy canula.

Tracheobronchial foreign body aspiration can be seen in all age groups but it is mostly seen in childhood and can be a fatal problem (1-3). In these cases, it is very important to diagnose rapidly and to remove the foreign body safely (4).

Although recently, advanced methods are used to remove the foreign bodies, foreign body aspiration is still an important health problem that it is mortal in more than 3000 cases per year and has complications with different sequelas (5).

FBA accounted for 7% of all accidental deaths in children under 4 years of age in the US during the year 1986. About 75% to 85% of all FBAs occur in children younger than 15 years old; however, most are younger than 3 years of age (6). Boys are affected more frequently than girls (7).

In our study, we reported an unusual foreign body aspiration case with difficult diagnosis. We aimed to discuss this laryngectomised patient according to the literature.

CASE REPORT

A 72-year-old man, who underwent total laryngectomy 7 years ago for a squamous cell carcinoma of the larynx, was admitted to emergency service with complaint of aspiration of a silicone tracheostomy canula. He was in a habit of cleaning secretions of the upper airway, with his finger via tracheostomy. However, at this time the tracheostomy canula has slipped into the trachea. The patient was admitted to emergency department. But he has not got any symptoms.

So the emergency doctors did not believe him. He had no abnormal sonority in both lungs at physical examination. He did not have fever showing signs of infecti-

on and he was very calm. The chest X-ray was normal (Figure 1). And the emergency doctor has convinced him that he didn't have any problems.

He applied to thoracic surgeon policlinic the day after. Physical examination and X-ray was normal again. But CT of the thorax revealed foreign body in left main bronchus (Figure 2). This foreign body was seen as long tube in his left main bronchus. But it was not blocking the air-way passage. A topical aerolized lidocaine spray and sedoanalgesia was performed to the patient. The trachea and left main bronchus was observed by RB. The tracheostomy canula had taken the shape of the left main bronchus. The forceps had been introduced through the RB to grasp gently the object for retrieval. Therefore, the RB, forceps and the tracheostomy canula were removed as a single unit. It was quite surprising to discover the silicone tracheostomy canula (Figure 3). The patient tolerated the procedure unexpectedly well and was discharged the following day.



Figure 1. X-ray image.

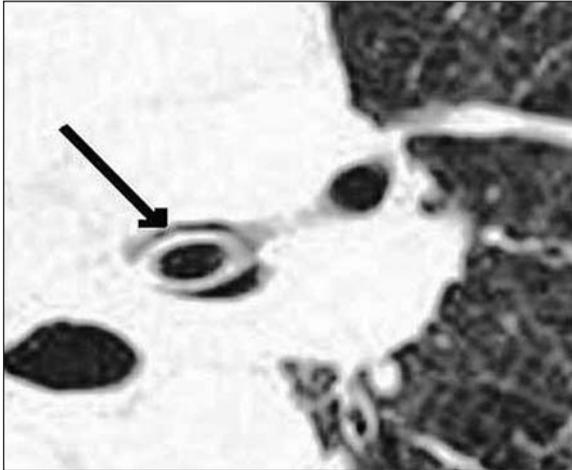


Figure 2. CT thorax; revealed foreign body in left main bronchus.



Figure 3. Tracheostomy canula.

DISCUSSION

Most of the foreign body aspiration patients apply to the hospital in first six hours after aspiration. The knowledge and experience of the doctors to whom the patient applies is very critical.

The type of foreign body aspirated differs according to countries. Some studies from USA and Europe show that the most common foreign bodies aspirated are peanut and foods in children but dental prosthesis and food remnants in adults (4,8-10).

Foreign body aspiration in adults, is often seen in geriatric population because of some underlying diseases. Alcohol consumption, use of sedative and hypnotic drugs, senility, convulsion, general anesthesia, intoxication, traumatic intubation, trauma with unconsciousness, mental retardation, dental prosthetic interventions, primary neurological diseases are the factors that lead to foreign body aspiration. Also, some anomalies, and some postoperative problems like laryngectomy or

tracheostomy may cause risk for the foreign body aspiration. Although only seven cases of aspiration in patients with a permanent post laryngectomy tracheal stoma have previously been published, we think that the presence of such a stoma should be added to the risk factors for foreign body aspiration in adults (11-14).

The localisation of foreign body is related with constuction of bronchial tree and posture of patient during aspiration (15). The most common localisation is right main and distal bronchus (16). Because, right main bronchus is in more vertical position and has bigger diameter than left (17). 2/3 of foreign bodies are placed in main bronchus.

Miscellaneous aspirated objects have been reported worldwide, although the most frequent are nuts, vegetable matter, bones, metal and plastic objects or pills. There are also many unusual objects such as doll shoes, safety pins, turban scarf pins, plastic spoons, fishing weight, cockroaches, straight pin, or iron pill, tetracycline and sucralfate tablet, wood branch, plastic whistle and metallic fractured tracheostomy canula via tracheostomy (18).

The patients often apply to emergency services after aspiration. Sometimes there is no symptoms or sometimes there are several symptoms like cough, dyspnea, and hemoptysis. In our patient, there were not any symptoms. Because our patient was elderly and his answers were suspicious, diagnosis was difficult. Occult foreign bodies can remain undetected for months to years and often are misdiagnosed (19).

In auscultation of patient with foreign body aspiration, wheezing can often be heard and ipsilateral chest sounds are limited (20,21). 21.8 % of patient with foreign body aspiration has delayed diagnosis (> 30 days) (22). For the diagnose, history, physical and radiological examination, and laboratory testing are frequently required and enough. Silvia et al. reported that sensitivity and specificity of radiological imaging methods for foreign body aspiration are 73% and 45% respectively (23). In the literature, rates of negative radiological finding show a huge variety of 8-80% (6,24,25). Most of foreign body can not be seen in chest radiogram but diagnosed by thorax CT like in our case. In some patients CT can not diagnose because of organized secretions.

Bronchoscopy should be done for the patients with respiratory problems without any clinical findings. Most of times, the first preference is flexible bronchoscopy (FB). FB is often enough to diagnose aspiration and to remove the foreign body. Some authors reported that FB is successful in about 100% in foreign body aspiration.

tion. However, it is a fact that these authors ignored the cases of thoracic surgery and pediatric surgery. FB has some advantages like facility of use, requires no anesthesia, enables to see distal bronchus. However, FB requires anesthesia but not general anesthesia. Against all these developments, rigid bronchoscopy (RB) is still the most effective method in diagnosis and treatment of foreign body aspiration. RB has some advantages like easy manipulation, facility of practical montage of telescopic systems, cost-effectiveness, good visualisation, and control of airway safety (20,26,27). RB is usually the first and correct preference in children. Also, the number of cases who are directly treated by a thoracic surgeon or whom FB was not successful and proposed RB is fairly great (24-28). In patients with tracheostomy and in some emergency cases, RB can be done without general anesthesia like in our case. FB have many advantages and recommended to be the first application in most of the adult cases. On the other hand, RB should be selected as first line procedure in only selected cases.

According to the literature, negative bronchoscopies are unavoidable. In the studies rates of negative bronchoscopy are 8.5%, 15.8% and 10.6% respectively. RB has usually important rates of morbidity and mortality. But this morbidity rate of bronchoscopy is very low with experienced surgeons. These rates are about 2-22%. It is reported that the complication rates are increased following urgent bronchoscopy (20,21,29). These complications consist of pathologies like simple respiratory infections, subcutaneous emphysema, bronchial irritation, pneumonitis, bronchospasms, pneumothorax, cardiac arrest and even death (20,21,30,31). It is a reality that most of the authors ignore the cases treated by Thoracic Surgeons and Pediatric Surgeons. RB is the treatment of choice in childhood population. Besides the number of cases that are treated directly by thoracic surgeons or that are proposed RB following an unsuccessful intervention with FB is fairly great (24-28,30).

The complications of foreign body aspirations are seen frequently. These complications differ with the type, localisation, aspiration time of the foreign body and with underlying medical conditions and other risk factors. The rate of bronchiectasis related with foreign body aspiration varies about 7.6-25% (31-33). In some cases with delayed diagnosis, foreign body may rarely cause hemoptysis (34,35). In these cases inflammation and granulation tissue appear surrounding the foreign body (29,36). Complications like persistent fever, chronic cough, recurrent lung infections, bronchiectasis,

bronchial stricture, atelectasis, lung abscess, pneumothorax and pneumomediastinum can be seen frequently (37,38).

Foreign body aspiration is still important for diagnosis and treatment. In the patient with risk factors, foreign body aspiration should be persistently searched and questioned. It should not be forgotten that bronchoscopy is the gold standard for diagnosis and treatment besides the clinical and radiological examinations.

CONFLICT of INTEREST

None declared.

REFERENCES

1. Midulla F, Guidi R, Barbato A, et al. Foreign body aspiration in children. *Pediatr Int* 2005; 47: 663-8.
2. Steen KH, Zimmermann TH. Tracheobronchial aspirated of foreign bodies in children: a study of 94 cases. *Laryngoscope* 1990; 100: 525-30.
3. Ciftci A, Bingol-Kologlu M, Senocak ME, Tanyel FC, Buyukpamukcu N. Bronchoscopy for evaluation of foreign body aspiration in children. *J Ped Surg* 2003; 38: 1170-6.
4. Friedman EM. Tracheobronchial foreign bodies. *Otolaryngol Clin North Am* 2000; 33: 179-85.
5. Black RE, Choi KJ, Syme WC, et al. Bronchoscopic removal of aspirated foreign bodies in children. *Am J Surg* 1984; 148: 778-81.
6. Manto PC, Tuggle DW, Tunell WP. An appropriate negative bronchoscopy rate in suspected foreign body aspiration. *Am J Surg* 1989; 158: 622-4.
7. Marquette CH, Martinot A. Foreign body removal in adults and children. In: Bolliger CT (ed). *Interventional bronchoscopy*. Basel: S Karger AG, 2000: 96-107.
8. Baharloo F, Veyckemans F, Francis C. Tracheobronchial foreign bodies presentation and management in children and adults. *Chest* 1999; 115: 1357-62.
9. Nakhosteen JA. Tracheobronchial foreign bodies. *Eur Respir J* 1994; 7: 429-30.
10. Swanson KL, Prakash UBS, Midhun DE. Flexible bronchoscopic management of airway foreign bodies in children. *Chest* 2002; 121: 1695-700.
11. Chen CH, Lai CL, Tsai TT, et al. Foreign body aspiration into the lower airway in Chinese adults. *Chest* 1997; 112: 129-33.
12. Uzaslan E, Ursavas A, Ediger D, Karadag M. An unusual way of tracheal stoma cleaning could end up with foreign body aspiration in a laryngectomized patient. *Tuberk Toraks* 2005; 53: 61-4.
13. Erdozain Rodriguez I, Sanchez Galan L, Zabaleta Lopez M, Sanchez del Hoyo A. An tracheobronchial foreign body in the laryngectomized patient. *An Otorrinolaringol Ibero* 1998; 25: 185-92.

14. Krempf GA, Otto RA. Fracture at fenestration of synthetic tracheostomy tube resulting in a tracheobronchial airway foreign body. *South Med J* 1999; 92: 526-8.
15. Rafanan AL, Mehta AC. Adult airway foreign body removal. What's new? *Clin Chest Med* 2001; 22: 319-30.
16. Dikensoy O, Usalan C, Filiz A. Foreign body aspiration: clinical utility of flexible bronchoscopy. *Postgrad Med J* 2002; 78: 399-403.
17. Celik P, Yorgancıoğlu A, Celik O. Laringotrakeobronşial yabancı cisim aspirasyonu. *KBB Klinikleri* 2000; 2: 50-6.
18. Eliashar R, Sichel JY, Dano I, Saah D. Foreign body aspiration in a laryngectomized patient. *Am J Emerg Med* 1998; 16: 103-4.
19. Yılmaz A, Akkaya ED, Damadoğlu E, Gungor S. Occult Bronchial body aspiration in adults: analysis of four cases. *Respirology* 2004; 9: 561-3.
20. Bodart E, de Biderling G, Tuerlinckx D, Gillet JB. Foreign body aspiration in childhood: management algorithm. *Eur J Emerg Med* 1999; 6: 21-5.
21. Metrangelo S, Monetti C, Meneghini L. Eight years experience with foreign body aspiration in children: what is really important for timely diagnosis? *J Ped Surg* 1999; 34: 1229-31.
22. Saquib MM, Rauf KA, Al-Bassam A. Late presentation of tracheobronchial foreign body aspiration in children. *J Trop Pediatr* 2005; 51: 145-8.
23. Silvia AB, Muntz HR, Clary R. Utility of conventional radiography in the diagnosis and management of pediatric airway foreign bodies. *Ann Otol Rhinol Laryngol* 1998; 107: 834-8.
24. Yıldırım M, Dogusoy I, Okay T, et al. Trakeobronşial yabancı cisimler. *TGKDÇD* 2003; 11: 228-31.
25. Kolbakır F, Kecelioglu T, Arıkan A ve ark. Yabancı cisim aspirasyonu suphesiyle bronkoskopi yapılan 152 vakanın retrospektif analizi. *TGKDÇD* 1994; 2: 2-6.
26. Mathur NN, Pradhan T. Rigid pediatric bronchoscopy for bronchial foreign bodies with and without Hopkins telescope. *Indian Pediatrics* 2003; 46: 761-5.
27. Limper AH, Parakash UBS. Tracheobronchial foreign bodies in adults. *Ann Intern Med* 1990; 112: 604-9.
28. Kisacik E, Gulhan E, Sirmali M, Sarica E ve ark. Trakeobronşiyal Yabancı Cisim Aspirasyonları: 261 Olgunun Analizi. *Solunum Dergisi* 2004; 2: 86-91.
29. Karakoc F, Cakir E, Ersu R, et al. Late diagnosis of foreign body aspiration in children with chronic respiratory symptoms. *Int J Pediatr Otorhinolaryngol* 2007; 71: 241-6.
30. Eren S, Balci A, Dikici B, Doblan M, Eren MN. Foreign body aspiration in children: experience of 1160 cases. *Ann Trop Paed* 2003; 23:31-7.
31. Findlay CA, Morrissey S, Paton JY. Subcutaneous emphysema secondary to foreign body aspiration. *Ped Pulmon* 2003; 36: 81-2.
32. Pasteur M, Helliwell S, Houghton S, Webb SC, Foweraker JE, Coulden RA, et al. An investigation into causative factors in patients with bronchiectasis. *Am J Respir Crit Care Med* 2000; 162: 1277-84.
33. Pogorzelski A, Zebrak J, Pawlik J, Cherian Z, Buchwald J. Broncho-pulmonary complications due to aspiration of foreign bodies by children. *Pediatr Pol* 1995; 70: 325-31.
34. Cataneo AJ, Reibschied SM, Ruiz Junior RL, Ferrari GF. Foreign body in the tracheobronchial tree. *Clin Pediatr* 1997; 36: 701-6.
35. Amir K, Ron S, Moshe G, Isaak S. Persistent cough and failure to thrive: a presentation of foreign body aspiration in a child with asthma. *Pediatrics* 2006; 117: 1057-60.
36. Zuniga S, De Manana M, Monge M, et al. Vegetal foreign body in the airway: an unusual cause of hemoptysis in childhood: clinical case. *Rev Med Chil* 2000; 128: 323-9.
37. Tokar B, Ozkan R, İlhan H. Tracheobronchial foreign bodies in children: importance of accurate history and plain chest radiography in delayed presentation. *Clin Radiol* 2004; 59: 609-15.
38. Sahni JK, Mathur NN, Kansal Y, Rana I. Bronchial foreign body presenting as an accidental radiological finding. *Int J Pediatr Otorhinolaryngol* 2002; 64: 229-32.