

Hordeum Murinum in The Right Lower Lobe Bronchus in a 2-Year-Old Patient Presenting with Hemoptysis

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ABSTRACT

Foreign body aspiration is a common condition in childhood and can cause serious complications. Although advanced techniques are used today to remove the tracheobronchial foreign body, there are still more than 3000 deaths and complications that leave different sequelae per year in the United States. Aspirating foreign bodies in the airways can lead to various complications because children mainly under the age of 3 years are not often diagnosed early. As children are especially very active during this period, they can easily escape the supervision of their parents during acute aspiration. The absence of positive history in children and nonspecific symptoms are the most likely causes of delay in diagnosis. In this case report, we aimed to raise awareness about the aspiration of wild barley (*Hordeum murinum*), which is an organic foreign body that is diagnosed late, is very rare, and progresses by migrating in the body.

INTRODUCTION

Foreign body aspiration is a common condition in childhood and can cause serious complications. Although advanced techniques are used today to remove the tracheobronchial foreign body, there are still more than 3000 deaths and complications that leave different sequelae per year in the United States.^[1,2] Aspirating foreign bodies in the airways can lead to various complications because children mainly under the age of 3 years are not often diagnosed early. As children are especially very active during this period, they can easily escape the supervision of their parents during acute aspiration.^[2] The absence of positive history in children and nonspecific symptoms are the most likely causes of delay in diagnosis. Most foreign bodies settle distal part of the tracheobronchial tree. The rate of placement in the bronchi is 80%–90%.^[1,2] Complaints

of patients show differences in the early and late periods. While the most common complaints in the early period were cough, wheezing, respiratory distress, and fever, late applicants are diagnosed during recurrent lung infection, bronchiectasis, hemoptysis, or during the investigation of atelectasis seen on random radiographs.^[2] In this case report, we aimed to raise awareness about the aspiration of wild barley (*Hordeum murinum*), which is an organic foreign body that is diagnosed late, is very rare, and progresses by migrating in the body. Youngest age wild barley aspiration removal with a bronchoscope without surgical intervention is the first in the literature.

CASE REPORT

A 2-year-old male patient was admitted to the hospital with a persistent cough for 2 weeks and bloody sputum.

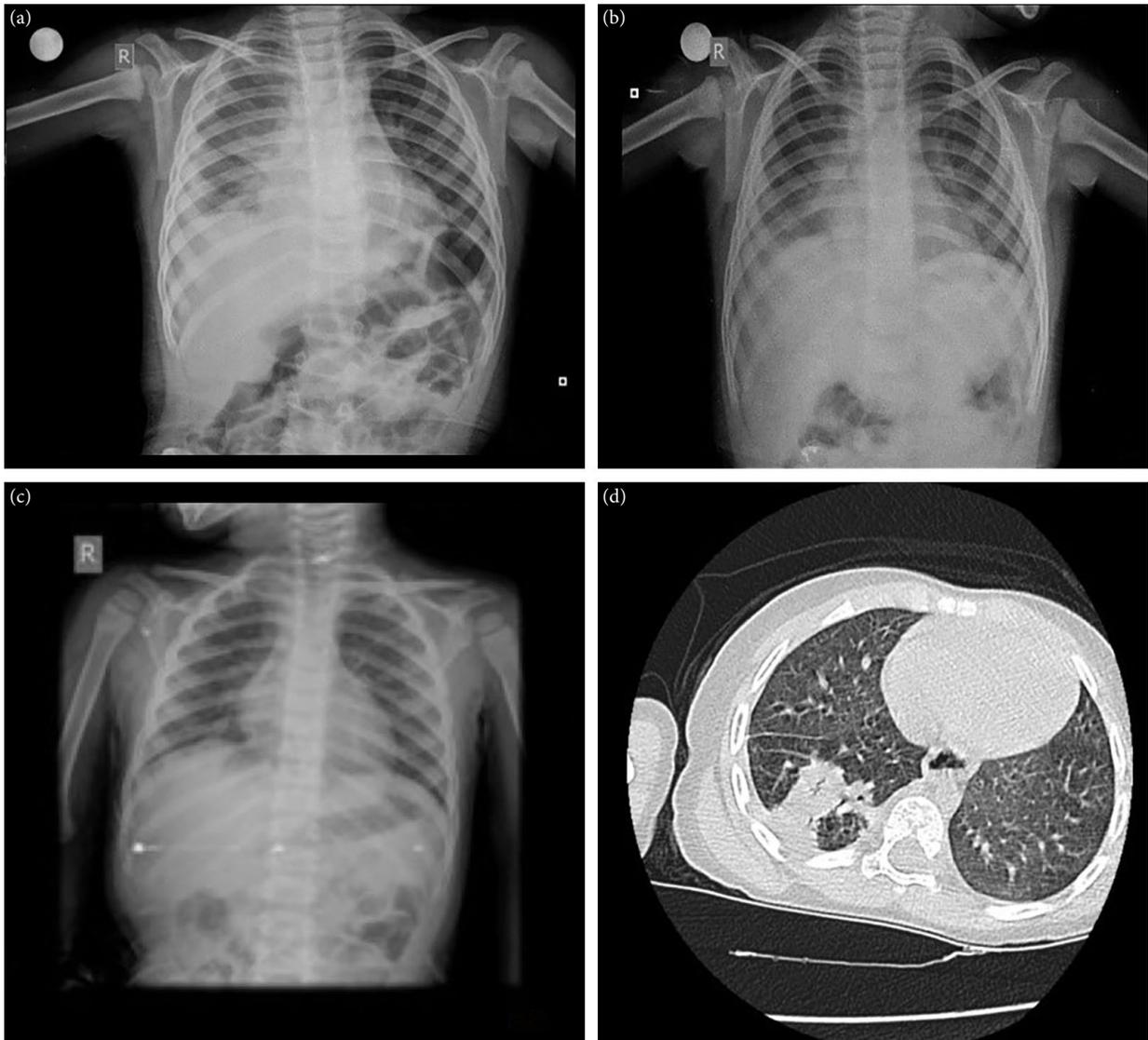


Figure 1. (a) Chest radiograph taken 3 months ago due to cough and fever and infiltration in the right paracardiac and right lower zone. (b) Partial improvement in infiltrations in the right lower zone after 2 weeks of antibiotic treatment. (c) Graph before bronchoscopy when presented with the complaint of hemoptysis and cough. (d) Thorax CT, area of consolidation in the right lower lobe.

The patient was admitted to the service with cough and fever 3 months ago and was diagnosed with pneumonia using chest radiography (Fig. 1a). After 14 days of nonspecific antibiotic treatment, his complaints and infiltration on chest radiography (Fig. 1b) regressed and discharged. However, his cough continued intermittently throughout the 3 months. There was no specific feature in his past and family history. Vaccines are made for age. There were no family members with chronic lung disease or tuberculosis. Axial fever 37.4°C , blood pressure 98/60 mmHg, pulse 110 min^{-1} , respiratory rate 24 min^{-1} , weight 13 kg (50 p) and height 90 cm (75 p) detected at the time of admission. Scar tissue from the BCG vaccine was seen. Cardiac beats were rhythmic, and no additional sound was detected. The respiratory sounds were less in the middle-basal region of the right lung compared with the left side. No pathological findings were detected in other system examinations. In the chest radiograph, infiltration was detected at the right

lower lobe (Fig. 1c). In thorax computerized tomography, a consolidation area was observed in the lower lobe of the right lung (Fig. 1d). Laboratory findings were as Hb: 10.8 g/dl, WBC: $11\,500\text{ mm}^{-3}$, platelets: $290\,000\text{ mm}^{-3}$, neu: 9530 mm^{-3} (82.5%), lymphocyte: 1800 mm^{-3} (15.6%), sedimentation 3 mm h^{-1} , CRP negative. Blood gas analysis and other biochemical and coagulation parameters were normal. The hemoptysis up to 5 cc along with the cough

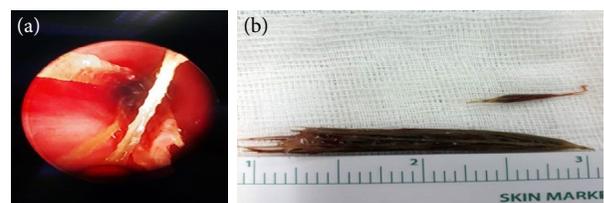


Figure 2. (a) Bronchoscopic image. (b) Hordeum murinum (wild barley) with a size of 3 cm removed using bronchoscopy.



Figure 3. *Hordeum murinum* (wild barley).

described by the patient before continued intermittently during his hospitalization. Flexible bronchoscopy was performed. A foreign body with fine tassels and prickly protrusions was detected in the right lower lobe bronchus. The approximately 3-cm-long wild barley (*H. murinum*) has been removed with a rigid bronchoscope by pediatric surgery (Fig. 2a, b). Parental consent has been received.

DISCUSSION

Hemoptysis is a rare life-threatening symptom in childhood. The most common causes in this age group are bronchiectasis, cardiovascular, and pulmonary congenital anomalies, and intrabronchial foreign bodies retention.^[3] *H. murinum* is a rare cause of hemoptysis. Foreign body aspiration is a common condition that can be missed easily at the age of 3 years and below. Aspirated materials are generally organic and nonopaque bodies. Therefore, it is very difficult to detect by radiography.^[1,2] Sunflower seeds and other seeds and nuts are the most common ones in Turkey.^[4-6] Herbal substances constitute 70%–80% of the airway foreign bodies in children. While food aspiration is more common in children under the age of 1 year, older children aspirate nonfood objects more often.^[2]

H. murinum is very common in nature (Fig. 3). This is particularly noticeable in the world's rural regions, including Turkey. Aspiration of wild barley has an atypical situation. Removal with a bronchoscope is especially difficult when the fishbone part is aspirated proximally and the pointed bottom distally. It has been determined that it can display migration due to its structure. After being aspirated, the pointed bottom part can migrate to the skin by crossing

the chest wall with the help of our movements and cough, and its more proximal tough fishbone structure can erode the areas it touches, causing bleeding.^[7]

Complications related to *H. murinum* aspiration can be acute (asphyxia, hemoptysis, cough, respiratory failure, and acute infection) or chronic (bronchiectasis due to recurrent infection, abscess, atelectasis, and skin fistulas).^[7] In our case, it had caused cough and recurrent pneumonia and was diagnosed after 3 months by flexible bronchoscopy. As in our case, it becomes very difficult to remove by bronchoscope when the posterior pointed bottom of the foreign barley is aspirated distally and the stiff fishbone part remains proximal. We first detected the presence of a foreign body by a flexible bronchoscope. Then pediatric surgery team had removed it with a rigid bronchoscope. It is a rare condition that *H. murinum* is diagnosed early in the bronchial tree, and if it is not diagnosed and not removed when in the bronchus, it could progress to the lung parenchyma, from there to the pleura and thorax wall, and even to the skin, present in the form of a skin abscess. A 13-year-old patient with a complaint of hemoptysis was presented with a foreign body that could not be detected by bronchoscope, and wild barley extracted from the soft tissue in the thorax by thoracotomy has been reported.^[8] Again, another 13-year-old patient presented with right side chest pain and pneumonia with soft tissue abscess in the posterior thorax. Bronchoscopy was also negative in this patient, but wild barley was removed by intra-skin abscess drainage.^[9] When a foreign body was not detected in the bronchoscopy of a 2.5-year-old girl who had bloody sputum, cough, and recurrent pulmonary infection and hemoptysis for 8 months, segmentectomy was performed and wild barley was observed in the lung parenchyma.^[9] In the smallest case in the literature, which was 16 months old, it was found that the invasion after the bronchus was fistulized to the skin. It was removed surgically by abscess drainage in the subcutaneous swelling, not in the intrabronchial period.^[10] Except for our case, *H. murinum* was diagnosed and removed by surgical methods (segmentectomy and lobectomy) or subcutaneous abscess debridement in all pediatric cases in the literature.^[7-13] Our patient had complaints for 3 months, and the aspirated *H. murinum* was seen in the right lower lobe bronchus with a flexible bronchoscope and was removed by rigid bronchoscopy. As far as we can see, it is the first case in literature at this age that *H. murinum* aspiration was detected and removed by a rigid bronchoscope while it is still in the bronchial lumen. As a result, it is very lifesaving to make a diagnosis by performing bronchoscopy at the early periods, regardless of the age of the child.

Informed Consent

Written informed consent was obtained from the patient parents for the publication of the case report and the accompanying images.

Peer-review

Internally peer-reviewed.

Authorship Contributions

Concept: S.G.; Design: S.G.; Supervision: S.G.; Materials: S.G., Y.A., Z.R.O., G.B., S.Y.; Data: S.G., C.U.D., Y.A., Z.R.O., G.B., S.Y.; Analysis: S.G., C.U.D., Y.A., Z.R.O., G.B., S.Y.; Literature search: S.G., Y.A., Z.R.O., G.B., S.Y.; Writing: S.G., Y.A., S.Y.; Critical revision: S.G., Y.A.

Conflict of Interest

None declared.

REFERENCES

1. Korlacki W, Korecka K, Dzielicki J. Foreign body aspiration in children: diagnostic and therapeutic role of bronchoscopy. *Pediatr Surg Int* 2011;27:833–7. [CrossRef]
2. Pekcan S, Aslan AT. Çocukluk çağında yabancı cisim aspirasyonları. *Turkish J Pediatr Dis* 2010;4:119–28.
3. Gaude GS. Hemoptysis in children. *Indian Pediatr* 2010;47:245–54.
4. Bakal Ü, Keleş E, Saraç M, Karlidağ T, Kaygusuz İ, Kazez A. A study of foreign body aspiration in children. *J Craniofac Surg* 2016;27:e358–63. [CrossRef]
5. Dorterler ME, Kocaman OH, Gunendi T, Boleken ME. A single-center experience of pediatric foreign-body aspiration: A retrospective 4-year case series. *Lung India* 2019;36:202–6. [CrossRef]
6. Eren S, Balci AE, Dikici B, Doblan M, Eren MN. Foreign body aspiration in children: experience of 1160 cases. *Ann Trop Paediatr* 2003;23:31–7. [CrossRef]
7. Dindar H, Konkan R, Cakmak M, Barlas M, Gökcora H, Yücesan S. A bronchopleurocutaneous fistula caused by an unusual foreign body aspiration simulating acute abdomen. *Eur J Pediatr* 1994;153:136–7.
8. Sayir F, Cobanoğlu Ufuk, Sertogullarından B, Mergan D. A foreign body aspiration showing migration and penetration: hordeum murinum. *J Clin Anal Med* 2012;3:454–6.
9. Kanbur S, Evman S, Dogruyol T, Yalcinkaya I. A Bronchopleurocutaneous fistula caused by unexpected foreign body aspiration: false barley (*Hordeum murinum*). *Ann Thorac Surg* 2015;100:e125–7. [CrossRef]
10. Bakan V, Köseoğlu B, Önem Ö, Bilici S. Gecikmiş trakeobronşial yabancı cisim aspirasyonu olgusu: pisi pisi otu (*Hordeum Murinum*). *Van Tıp Dergisi* 2000;7:63–5.
11. Dutau G. Pneumopleurocutaneous fistula after inhalation of an ear of barley (*Hordeum murinum*). *Ann Pediatr (Paris)* 1990;37:367–70.
12. Yucel G, Hangul M, Saracoglu S, Kose M. Pleuropulmonary fistula due to *Hordeum murinum* aspiration. *Pediatr Int* 2018;60:894–6.
13. Paillard S, Cochat P, David L. A migrating ear of barley: a curious story of an intrabronchial foreign body. *Pediatric* 1987;42:447–9.

Hemoptizi ile Başvuran 2 Yaşında Bir Hastanın Akciğer Sağ Alt Lob Bronşunda *Hordeum Murinum*

Yabancı cisim aspirasyonu çocukluk çağında sık görülen bir durumdur ve ciddi komplikasyonlara neden olabilir. Günümüzde trakeobronşiyal yabancı cisim çıkarmak için gelişmiş teknikler kullanılsa da, Amerika Birleşik Devletleri'nde hala her yıl farklı sekeller bırakan 3000'den fazla ölüm ve komplikasyon vardır. Hava yollarındaki yabancı cisimlerin aspire edilmesi, çoğunlukla 4 yaşın altındaki çocuklara sıklıkla erken teşhis konulmadığından çeşitli komplikasyonlara yol açabilir. Çocuklar özellikle bu dönemde çok aktif oldukları için akut aspirasyon sırasında ebeveynlerinin gözetiminden kolaylıkla kaçabilirler. Çocuklarda pozitif öykünün olmaması ve spesifik olmayan semptomlar tanıda gecikmenin en olası nedenleridir. Bu olguda geç teşhis edilen, çok nadir görülen ve vücutta göç ederek ilerleyen organik bir yabancı cisim olan yabani arpanın (*Hordeum murinum*) aspirasyonu hakkında farkındalık yaratmayı amaçladık.

Anahtar Sözcükler: Bronkoskopi; hemoptizi; *Hordeum murinum*; pisi pisi otu; yabancı cisim aspirasyonu.