

# Foreign Body Aspiration In Children And Results Of Treatment \*

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ÇOCUKLARDA YABANCI CİSİM ASPİRASYONU  
VE TEDAVİ SONUÇLARI

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## SUMMARY

*Between October 1982 and October 1988, we treated 190 patients with foreign body in the tracheobronchial tree. This study includes children between 0 and 14 years old. The youngest patient was 3 months old. 105 of our patients were female and 85 were male-*

*One hundred and thirty seven foreign bodies were chickpeas, dried beans, sunflower arid water melon seeds and nuts. Non-organic materials (glass maroles, glass beads, nails, pins, different metallic pieces) and bone pieces were found in other 52. In one case, parts of germinative membrane of hydatid cyst ruptured to bronchus has been aspirated too.*

*In 187 patient, the foreign bodies were removed at Bronchoscopy. In 4 of these, we used Fogarty catheter. Three patients were operated on, because the impacted foreign bodies (maroles and parts of germinative membrane of hydatid cyst) could not be removed at bronchoscopy. In these patients, the impacted foreign bodies were removed by performing thoracotomy and bronchotomy. No complication occurred in any of the patient.*

*We highly recommend authorities to give the required training to parents.*

key Words: Tracheobronchial tree, foreign body aspiration.

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## ÖZET

*Biz, Ekim - 1982, Ekim - 1988 tarihleri arasında trakeobronkiyal sisteme yabancı cisim aspire etmiş 0 - 14 yaş grubundan 190 çocuğu tedavi ettik. En genç hasta 3 aylıktı. Hastalarımızın 105'i kız, 85'i erkek çocuğu idi.*

*137 vakada yabancı cisim olarak ay çekirdeği, karpuz çekirdeği, kum fasulye - nohut, fındık ve fıstık içi çıkartıldı. 52 vakada cam bilye, boncuk, çivi, toplu iğne. farklı metalik parçalar gibi organik olmayan cisimler ve kemik parçaları bulundu. Bir vakada da bronşa açılmış ve bu yolla aspire edilmiş hidatik kist germinatif membran parçaları bulundu.*

*187 vakada yabancı cisim, bronkoskopiyle çıkartıldı. Bunların 4'ünde Fogarty kateteri kullandık, üç hasta, yerleşmiş yabancı cisimleri (bilye ve hidatik kist germinatif membran parçaları) bronkoskopiyle çıkaramadığımız için ameliyat edildiler. Bu üç hastada yerleşmiş yabancı cisimler torakotomi \* bronkotomi yapılarak çıkartıldılar. Hastalarımızın hiç birinde komplikasyon gelişmedi.*

*Bizim ilgililere özellikle tavsiyemiz, ebeveynlere gerekli uyarıyı vermeleridir.*

Anahtar Kelimeler: Trakeobronkiyal sistem, yabancı cisim aspirasyonu.

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## MATERIAL AND METHOD

Aspiration of foreign bodies into tracheobronchial tree occurs at all ages, but frequently in childhood. Majority of the cases are from children of families with low socio-economic level. In our service, 190 cases with foreign bodies were treated on between October 1982 and October 1988.

Between October 1982 and October 1988, 190 cases had been admitted to our service owing to aspirated foreign body. Most of them had been sent to our service, which is the only thoracic surgery centre in the area, to be treated as diagnosed or to be investigated by private medical doctors or from the local hospitals.

Table - 1

Distribution Of The Cases According To Ages Groups And Localisation In The Tracheobronchial Tree

AGE	Right Lung No. cases (%)	Left Lung No. cases (%)	Trachea No. cases (%)	Total No. cases (%)
0 - 2	28 (14.7)	8 (4.2)	— —	36 (18.9)
2 - 4	36 (18.9)	18 (9.4)	— —	54 (28.4)
4 - 6	12 (6.3)	6 (3.1)	5 (2.6)	23 (12.1)
6...8	8 (4.2)	6 (3.1)	— —	14 (7.3)
8 - 10	10 (5.2)	* (2.1)	2 (1.0)	16 (8.4)
10 - 12	13 (6.8)	5 (2.6)	— —	18 (9.4)
12 - 14	12 (6.3)	14 (7.3)	3(1.5)	29 (15.2)
<b>Total</b>	119 (62.6)	61 (32.1)	10 (5.2)	190 (100.0)

105 of our cases were female and 85 were male. The youngest case was 3 months old and foreign body aspiration had been most frequently seen in those who are between 2 and 4 years of age. Distribution of the cases according to age groups are seen in Table 1.

In the majority of cases, foreign bodies had been discovered by their parents. For this reason the children had been brought directly or indirectly to our service. In 18 of the cases, the event remained undiscovered or the children were too young to tell anything. Therefore, diagnosis could be made rather late, e.g. ten months later as a consequence of examinations performed on the child.

The most prominent symptom in the patients who were diagnosed with foreign bodies and treated was cyanosis together with cough. Of course, this symptom was seen soon after aspiration of the foreign bodies and noticed by the parents who were aware of the event. But this must have certainly occurred in the cases who were not caught on aspiration as well. The most frequent symptoms after cyanosis and cough were dyspnea and wheezing.

During the physical examination, stridor and intercostal retraction at inspiration were the most frequent findings that we noted. Reduced or lost respiratory sounds in one hemithorax, wheezing, fever and pathologic respiratory sounds that develop as a consequence of being late in bringing the patient to the hospital are the following symptoms.

All patients were given radiologic examination. At P. A. chest graphics routinely taken, 92 cases have been normally detected and because of the foreign body was radio-opaque in 35 cases, the image was directly achieved (Picture 1,2). Excessive aeration in a hemithorax and mediastinal shift in 45 cases, pneumothorax in one case, atelectasia in a hemithorax and mediastinal shift towards the atelectasic side have been observed in 17 cases (Picture 3).

We used rigid bronchoscope in all cases, under general anesthesia. Before endoscopy, we premedicated using atropine and when necessary additional diazepam. When we finished endoscopic examination



Figure 1: A nail is seen in the right main bronchus.

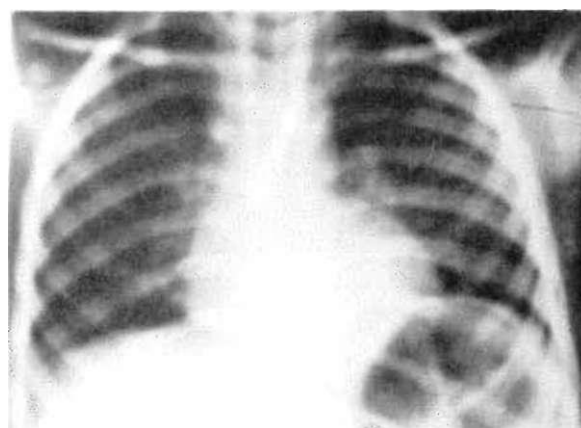


Figure 2: A small metal spoon is seen in the right main bronchus.

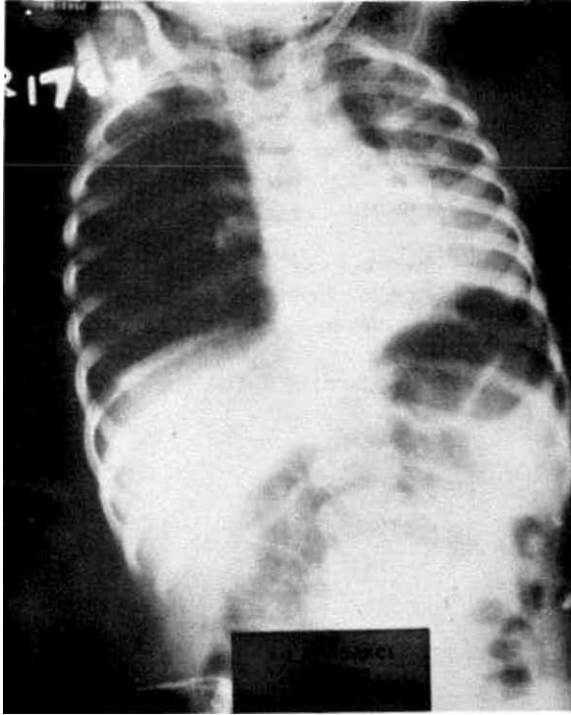


Figure 3: Total atelectasis and mediastinal traction to left developed due to total obstruction of the left main bronchus with foreign material.

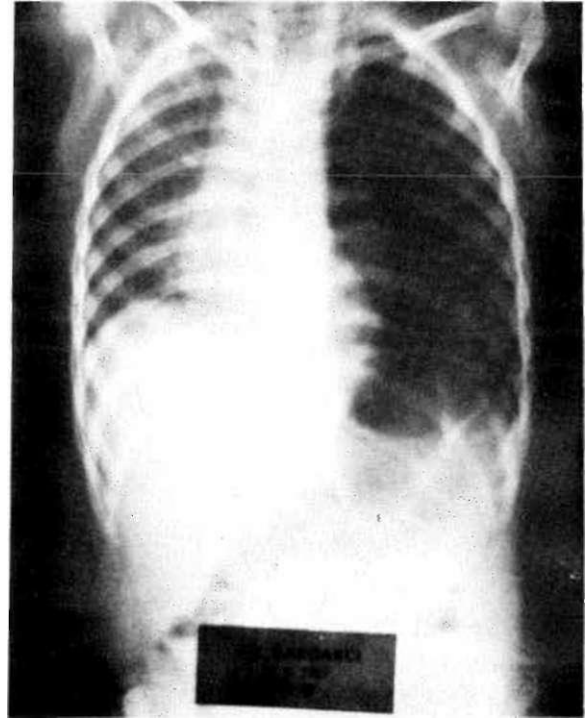


Figure 4: Pneumothorax occurred at the left lung due to total obstruction of the left main bronchus with foreign material.

we often administered a single dose and rarely more prophylactic steroid to prevent a possible oedema in the larynx.

Now we will report two cases due to their particularity.

Case 1: A.B. A 2 year-old boy. He had a non-productive cough for 1 mo. For 15 days in addition to this complain, dyspnea and fever were added, too. Non-specific antibiotic treatment was administered. As the complaints of the patient had not improved, he has hospitalized for the purpose of examination and treatment on June 6\* 1987. Increased sonor sounds in the left hemithorax and severely decreased respiratory sounds in the same side were detected. At the P.A. chest graphy there wastiearly a total pneumothorax in the same hemithorax (Picture 4). For that reason, an under-water drainage was inserted through the left second intercostal space. At the control chest graphy, atelectasia was still seen in the left (Picture 3). In order to detect foreign bodies bronchoscopy was performed under general anesthesia. On seeing a part of chick-pea that had totally obstructed the left main bronchus it was taken out by using forceps. The secretion which had accumulated at the distal part of bronchus was aspirated. The patient **was** discharged with total recovery on July 6\* 1987 (Picture 5).

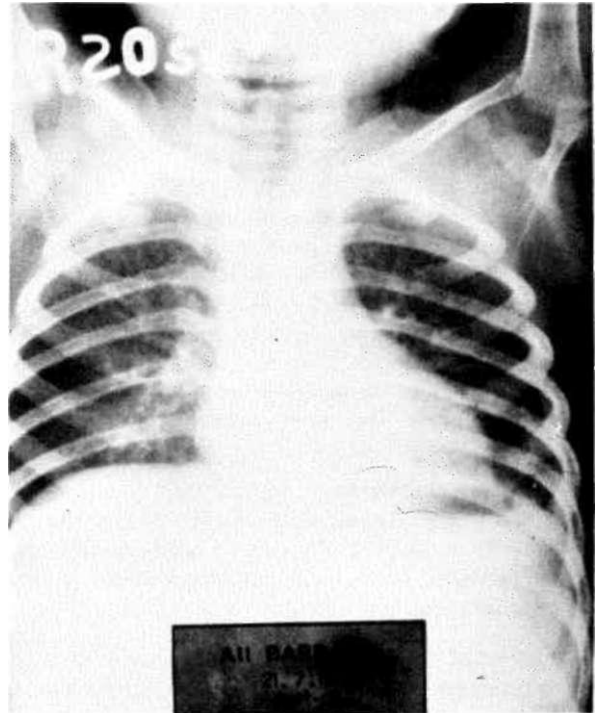
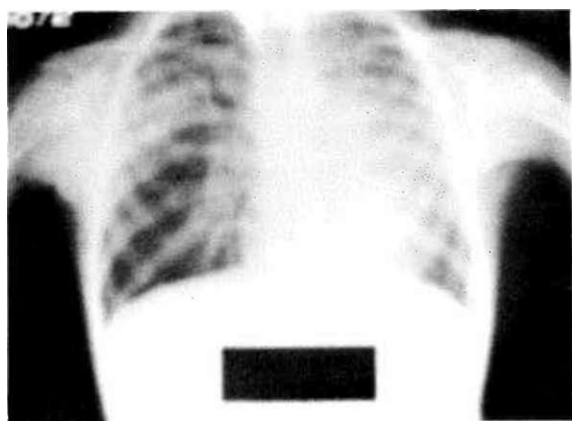


Figure 5: Chest X-ray after the removal of the foreign material which obstructed the left main bronchus.

Case 2: M.K' A 6 year-old boy. He had been suffering from coughing, sputum and fever for ten months. Additionally, he had had wheezing and cyanosis for the last one month. At pediatric service he had been given non-specific antibiotic treatment for 1 month. We consulted the patient on April 24\*\*, 1987. On examination extremely reduced respiratory sounds in the right lower zone and generalized wet rales in both hemithorax were detected (Picture 6). It was decided to give an endoscopic examination. During bronchoscopy which was performed under general anesthesia, the right intermedier bronchus was seen as obstructed by infected tissue pieces. Basal segmental bronchus of the left lower lobe had been similarly obstructed. Infected material was ext-



**Figure 6:** Bilateral diffused infiltrations as a result of atelectasias caused by germinative membrane pieces, due to perforation of the hydatid cyst into bronchus which localised in lingular segment of the left lung.

According to the data obtained at the end of physical radiological and endoscopic examination, foreign bodies had localized in right main bronchus and/or its branches in 119 (62.6%) of our 190 cases that constitute our series, in trachea in 10(5.3%) cases and in left main bronchus and/or its branches in 61 (32.1%) cases. Distribution of our cases according to localisation in the tracheobronchial tree are seen in Table 1.

Among the removed foreign bodies, the majority were dried fruits, water melon and sunflower seeds, like in 137 (72.1%) cases. Various metallic and bone particles, beads, nails and pins follow the first ones in frequency (Table 2).

Most of foreign bodies were removed through rigid bronchoscopies or using forceps with bronchoscope. Forceps failed in 6 of the cases with aspirated beads and maroles. In the four of these, the beads were removed by Fogarty catheter and on the other

racted by forceps and aspirated by aspirator as well. At the histopathologic examination of this material, it was found to be pieces of hydatid cyst germinative membrane. At the control chest graphy the right hemithorax was normal. But the image in the left hemithorax remained the same on April 26\*, 1987. The patient was transferred to thoracic surgery service and a left thoracotomy was performed. It was detected that the upper lobe and lingula were completely atelectatic. Bronchotomy was made to bronchus of lingula and germinative membrane pieces were evacuated. The upper lobe gained its expansibility again. The superior segment of lingula was resected. Later, that Datient was discharged with complete recovery



**Figure 7:** Control chest X-ray of the patient after treatment who aspirated germinative membrane pieces of the hydatid cyst internally.

**Table - 2**

Distribution of our cases according to kinds of foreign bodies

Kind of foreign bodies	No. cases (%)
Chickpeas and beans	72 (37.9)
Sunflower and water melon seeds	36 (18.9)
Nuts	29 (15.3)
Pieces of bone and metal	21 (11.0)
Nails	14 (7.4)
Pins	11 (5.8)
Glass maroles and beads	6 (3.2)
Parts of hydatid cyst	1 (0.5)
<b>Total</b>	<b>190 (100.0)</b>

two cases with aspirated marole we performed thoracotomy\*bronchotomy and treatment was achieved.

No complication occured in any of the cases.

## RESULTS

Between October 1982 and October 1988, we have treated 190 cases due to foreign body in the tracheobronchial tree. 90 (47.4%) cases were from the 0-4 age group, and 37 (19.5%) cases from 4-8, 16 cases from 8-10 and 47 (24.7%) were from the 10-14 age group.

Beans and chickpeas in 72 (37.9%) of the 190 cases, pieces of bone and metal in 21 (11.0%), sunflower and water melon seeds in 36 (18.9%), nuts in 29 (15.3%), nails in 14 (7.4%), pins in 11 (5.8%) and glase beads and/or maroles in 6 (3.2%) were met.

In 187 (98.4%) cases the foreign bodies were extracted by bronchoscope. 3 cases were taken to aspiration as a result of failure in removing the foreign body. Rigid bronchoscope was used in all patients.

## DISCUSSION

Although aspiration of foreign bodies into tracheobronchial tree occurs at all ages, this case appears at rather high percentage in infants and children, especially in those families with low socioeconomic level (1). These families give their children dried fruits and other materials which can easily be aspirated into the respiratory tractus. When children laugh and talk, foreign bodies easily find their way into the respiratory tractus.

The history taken from children themselves who aspirate foreign bodies into the tracheobronchial tree of from their families includes symptom such as cough, wheezing and fever. In some instances, after the aspiration of foreign bodies, there may be no symptoms at all for several weeks. In children who initially had a cough and later whose cough disappeared possibility of a foreign body should be thought (2, 3, 4).

Anatomically, the foreign bodies usually localize in the right lung; they are most frequently detected in lower lobe of right lung. Rarely, they are aspirated into the bronchus of the upper lobe. If the foreign body is radio-opaque, its kind and location can be determined. A non-opaque, foreign body should be suspected when obstructive emphysema, segmental atelectasia or lobar atelectasia are detected (5, 6, 7,8).

With the foreign bodies, early diagnosis is essential. Delays at foreign body diagnosis and treatment may be dangerous and even fatal (8).

Most of our patients had been administered long term antibiotic treatment because of repeated respiratory tract infections in various pediatric services and as the treatment failed, foreign body had been suspected and they had been sent to our service. Bronchoscopy must be performed with no delay in the cases which do not improve the inflammatory process in their lungs.

Removal of the foreign bodies is not generally dangerous. General anesthesia provides a lot of facilities during the extraction of the foreign body in children. In the removal of the foreign body, rigid bronchoscope is an important instrument to be chosen without discussion (1, 2, 4, 6, 9). We never used the flexible bronchoscope in our cases because respiratory tract cannot be sufficiently controlled with this instrument and the use of this is contraindicated in children because of the air way in younger children and infants is too narrow. Foreign bodies are easily seen and extracted with rigid bronchoscopy tube is withdrawn and extracted together with bronchoscope.

Removal with forceps failed in 6 of our cases since the aspirated foreign bodies were beads in these cases. In 4 of these 6 cases, we passed the Fogarty catheter through the bronchoscopy tube and later the hole of the bead, swelled the balloon and pulled it out together with the bronchoscope. Since two of our cases had aspirated marole, bronchoscope and fogarty catheter failed and we were able to remove them by performing thoracotomy and bronchotomy.

Extraction of a foreign body should not be delayed because it may cause supuration and bronchiectasia and may lead to pulmonary resection (1, 10, 11, 12, 13). Thoracotomy is necessary in such instances (1, 7, 14,15).

To prevent children from the danger of foreign bodies, it is necessary to keep out of children's reach dried fruits and materials which can escape into their respiratory tract (1, 16). We highly recommend authorities to give the required training to parents.

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