Original article:

Prevalence and Clinical Profile of Tracheobronchial Foreign Body Cases: A Institutional Based Study

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Abstract

Background: Tracheo-bronchial foreign body aspiration is an important airway emergency, particularly in young children, and may cause respiratory obstruction, infection, prolonged hospitalization, or death when diagnosis and treatment are delayed. Early recognition through clinical history, examination, imaging, and bronchoscopy is essential.

Aim: To determine prevalence and clinical profile of tracheobronchial foreign body cases.

Materials and Methods: This hospital-based observational study included 105 patients with confirmed tracheo-bronchial foreign bodies. Patients of all ages and both sexes diagnosed by clinical evaluation, radiological investigations, bronchoscopy, or intraoperative findings were included. Data were collected using a structured proforma covering demographic characteristics, symptoms, radiological findings, type and location of foreign body, mode of removal, complications, hospital stay, and treatment outcomes. Data were analyzed using SPSS version 16.0. Categorical variables were presented as frequencies and percentages, and associations were assessed using the Chi-square test or Fisher's exact test. A p-value below 0.05 was considered statistically significant.

Results: Of 105 patients, 73 (69.52%) were younger than 5 years, and 68 (64.76%) were male. Cough was the commonest symptom in 92 (87.62%) patients, followed by choking in 81 (77.14%), wheezing in 63 (60.00%), and decreased breath sounds in 58 (55.24%). Obstructive emphysema or hyperinflation was the most frequent radiological finding in 39 (37.14%) patients, while 24 (22.86%) had a normal chest radiograph. Organic foreign bodies accounted for 78 (74.29%) cases, and the right main bronchus was the commonest site in 56 (53.33%). First-attempt removal was successful in 96 (91.43%) patients. Delayed presentation was significantly associated with lower first-attempt removal success (p=0.026), higher complication rates (p=0.010), and hospital stay longer than 3 days (p=0.001).

Conclusion: Tracheo-bronchial foreign bodies mainly affected male children below 5 years. Organic materials and right main bronchial lodgement were most common. Prompt diagnosis and early bronchoscopic removal improved treatment success and reduced complications and prolonged hospitalization.

Key words: Tracheo-Bronchial Foreign Body; Foreign Body Aspiration; Bronchoscopy; Airway Obstruction; Children.

INTRODUCTION

Tracheo-bronchial foreign body aspiration is a medical emergency that can produce airway obstruction. It occurs when an external object enters the trachea, a main bronchus, or a distal bronchial segment during eating, play, or accidental handling of small objects. The condition requires prompt recognition because the course may range from transient coughing to severe respiratory distress, hypoxia, cardiopulmonary arrest, and death. Although it can occur at any age, children are vulnerable because of their small airway diameter, immature

protective reflexes, tendency to explore objects orally, and limited ability to describe an aspiration event. These characteristics make tracheo-bronchial foreign bodies a concern in paediatric, emergency, pulmonary, and otorhinolaryngology practice.[1]

The nature of the aspirated material is influenced by age, diet, cultural practices, and the immediate environment. Organic materials such as nuts, seeds, food particles, and vegetable fragments are encountered in children, whereas toys, beads, pen caps, pins, plastic pieces, and metallic items constitute inorganic foreign bodies. Organic materials may absorb moisture, enlarge within the airway, and initiate inflammation, while sharp or irregular objects may injure the mucosa or become firmly impacted. The physical characteristics of an object influence its site of lodgement and the degree of obstruction. A careful description of the object and circumstances surrounding aspiration can therefore assist clinical assessment and preparation for removal.[2]

Clinical presentation depends on the patient's age, foreign-body location, obstruction severity, and the interval before presentation. A witnessed choking episode followed by sudden coughing is suggestive, but aspiration may be unwitnessed or forgotten by caregivers. Patients may present with cough, wheezing, dyspnoea, stridor, cyanosis, fever, unilateral reduction in air entry, or recurrent respiratory infection. Symptoms can improve after the initial episode, causing false reassurance and delayed consultation. Retained foreign bodies may resemble asthma, bronchiolitis, pneumonia, or tuberculosis when the history is unclear. Clinicians must therefore maintain a high index of suspicion whenever unexplained or persistent respiratory symptoms follow eating or play.[3]

Radiological evaluation supports diagnosis but should be interpreted with the history and physical examination. Plain chest radiography may demonstrate a radio-opaque object or indirect signs such as unilateral hyperinflation, obstructive emphysema, atelectasis, consolidation, and mediastinal shift. However, many aspirated objects are radiolucent, and a normal radiograph cannot exclude their presence. Additional radiographic views may help identify air trapping. Computed tomography with multiplanar reconstruction or virtual airway assessment may provide additional information in selected stable patients with uncertain findings. Nevertheless, imaging must not delay definitive airway evaluation when clinical suspicion is high or respiratory compromise is present.[4]

Bronchoscopy has a central role in confirming the diagnosis, identifying the location and nature of the foreign body, assessing mucosal injury, and permitting extraction. Rigid bronchoscopy under general anaesthesia remains an established therapeutic approach in children because it provides airway control, ventilation, visualization, and access for grasping instruments. Flexible bronchoscopy may assist diagnostic evaluation, distal localization, or selected removal procedures, depending on expertise and equipment. Safe management requires coordination among the bronchoscopist, anaesthesiologist, paediatrician, nursing staff, and emergency team. Suitable instruments and postoperative monitoring must be available.[5]

Delay in diagnosis can allow inflammation, oedema, granulation tissue, infection, bleeding, or distal migration to develop around the retained object. These changes may make extraction difficult and increase the likelihood of repeated procedures, prolonged hospitalization, intensive care, or surgery. A structured assessment combining aspiration history, choking, respiratory symptoms, physical signs, and radiological abnormalities can improve decision-making. Clinical algorithms may be valuable when the history is uncertain or findings are subtle. However, judgement remains essential because no single symptom, examination finding, or imaging feature can reliably confirm or exclude every tracheo-bronchial foreign body.[6]

MATERIALS AND METHODS

This hospital-based observational study was conducted to determine prevalence and clinical profile of tracheobronchial foreign body cases. The study was designed to analyze the demographic characteristics, clinical presentation, radiological findings, anatomical location, nature of foreign bodies, management modalities, and treatment outcomes among affected patients. A total of 105 patients diagnosed with tracheo-bronchial foreign bodies were included in the study. Patients of all age groups and both sexes with a confirmed diagnosis of tracheo-bronchial foreign body based on clinical evaluation, radiological investigations, bronchoscopic findings, or intraoperative confirmation were enrolled. The diagnosis was established through a detailed clinical assessment and appropriate investigations as per institutional protocols.

Inclusion Criteria: Patients presenting with a definite history or clinical suspicion of foreign body aspiration and subsequently confirmed to have a tracheal or bronchial foreign body through imaging studies, rigid bronchoscopy, flexible bronchoscopy, or surgical intervention were included in the study. Both emergency and elective cases were considered eligible for participation.

Exclusion Criteria: Patients with foreign bodies located exclusively in the nasal cavity, nasopharynx, oropharynx, hypopharynx, esophagus, or gastrointestinal tract were excluded. Patients with incomplete medical records, unconfirmed diagnoses, or those who were managed elsewhere before referral without adequate documentation were also excluded from the study.

Methodology: Data were collected using a structured proforma designed for the study. Information regarding demographic characteristics such as age, sex, and place of residence was recorded. Detailed clinical history including history of aspiration, presenting symptoms, duration of symptoms before presentation, and associated respiratory complaints was obtained. Clinical parameters assessed included cough, choking episode, wheezing, dyspnea, stridor, fever, cyanosis, recurrent respiratory infections, decreased breath sounds, and other relevant physical examination findings.

Radiological and Diagnostic Evaluation: All patients underwent appropriate radiological investigations based on clinical indications. Chest radiography was performed to identify radio-opaque foreign bodies and indirect radiological signs such as hyperinflation, atelectasis, consolidation, mediastinal shift, or obstructive emphysema. Additional imaging studies, including computed tomography of the chest, were performed when required. Bronchoscopic evaluation served as the definitive diagnostic modality for localization and confirmation of the foreign body.

Study Variables: The parameters analyzed included age distribution, gender distribution, clinical presentation, history of witnessed aspiration, duration between aspiration and hospital presentation, radiological findings, type of foreign body (organic or inorganic), anatomical site of lodgment (trachea, right main bronchus, left main bronchus, or segmental bronchi), method of removal, intraoperative findings, complications encountered, duration of hospital stay, and treatment outcomes. The success rate of bronchoscopic removal and the need for additional interventions were also evaluated.

Management Protocol: All patients were managed according to standard institutional guidelines. Foreign body removal was primarily performed using rigid bronchoscopy under general anesthesia. Flexible bronchoscopy was utilized in selected cases when clinically indicated. The type of anesthesia, procedure performed, intraoperative complications, and postoperative outcomes were documented. Patients were monitored postoperatively and followed for the assessment of symptom resolution and procedure-related complications.

Outcome Measures: The primary outcome measure was the prevalence of tracheo-bronchial foreign body cases among patients presenting to the tertiary care hospital. Secondary outcome measures included demographic distribution, pattern of clinical presentation, characteristics and location of foreign bodies, radiological findings, success of bronchoscopic removal, complications, and overall clinical outcomes following treatment.

Statistical Analysis: The collected data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) software version 16.0. Descriptive statistics were used to summarize the data. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. Associations between categorical variables were analyzed using the Chi-square test or Fisher's exact test wherever applicable. A p-value of less than 0.05 was considered statistically significant.

RESULTS

In the present study, a total of 105 patients with confirmed tracheo-bronchial foreign bodies were included. As shown in Table 1, the majority of cases were observed in children below 5 years of age. The highest number of patients belonged to the below 3 years age group, comprising 42 (40.00%) cases, followed by the 3–5 years age group with 31 (29.52%) cases. Thus, 73 (69.52%) patients were below 5 years of age. The 6–10 years age group included 18 (17.14%) patients, while 14 (13.33%) patients were above 10 years of age. Overall, males were more commonly affected than females, with 68 (64.76%) males and 37 (35.24%) females. Male predominance was seen in almost all age groups, especially below 3 years and 3–5 years. However, the association between age group and gender distribution was not statistically significant, as indicated by Pearson Chi-square test value χ^2=2.867 and p=0.413.

Table 2 shows the clinical presentation of patients with tracheo-bronchial foreign bodies. Cough was the most common presenting symptom, observed in 92 (87.62%) patients, followed by a definite history of choking episode in 81 (77.14%) patients. Wheezing was present in 63 (60.00%) patients, while decreased breath sounds were noted in 58 (55.24%) patients. Dyspnea was reported in 47 (44.76%) patients, suggesting partial airway obstruction in a considerable proportion of cases. Fever was present in 29 (27.62%) patients and recurrent respiratory infection was observed in 24 (22.86%) patients, which may indicate delayed presentation or secondary infection. Stridor was seen in 18 (17.14%) patients, whereas cyanosis was the least common feature, noted in 9 (8.57%) patients. Since many patients had more than one symptom, the total percentage exceeded 100%.

Table 3 presents the radiological findings according to age category. Obstructive emphysema or hyperinflation was the most common radiological finding, seen in 39 (37.14%) patients. It was more frequent in children below 5 years, where it was observed in 30 (41.10%) patients, compared with 9 (28.12%) patients aged 5 years or above. A normal chest radiograph was found in 24 (22.86%) patients, showing that normal radiology does not exclude the diagnosis of tracheo-bronchial foreign body. Normal X-ray findings were relatively more common in patients aged 5 years or above, 11 (34.38%), compared with children below 5 years, 13 (17.81%). Atelectasis was seen in 17 (16.19%) patients, consolidation in 13 (12.38%), radio-opaque foreign body in 8 (7.62%), and mediastinal shift in 4 (3.81%) patients. The comparison between normal and abnormal chest radiographs among the two age groups showed no statistically significant difference, with Fisher's exact test p=0.079.

As shown in Table 4, organic foreign bodies were more common than inorganic foreign bodies. Out of 105 cases, 78 (74.29%) were organic foreign bodies, while 27 (25.71%) were inorganic. The right main bronchus was the most common site of lodgment, accounting for 56 (53.33%) cases, followed by the left main bronchus in 31 (29.52%) cases. Tracheal foreign bodies were found in 10 (9.52%) patients, and segmental or bilateral bronchial foreign bodies were found in 8 (7.62%) patients. Organic foreign bodies were most frequently lodged in the right main bronchus, 45 (80.36%), and left main bronchus, 24 (77.42%). In contrast, inorganic foreign bodies were proportionately more common in the trachea, where 6 (60.00%) out of 10 cases were inorganic. A statistically significant association was found between the nature of foreign body and anatomical location, with χ^2=7.976 and p=0.047.

Table 5 shows the association between delay in presentation and treatment outcomes. Among 105 patients, 64 presented within 24 hours and 41 presented after 24 hours. First-attempt removal was successful in 62 (96.88%) patients who presented within 24 hours, compared with 34 (82.93%) patients who presented after 24 hours. This difference was statistically significant, with p=0.026. Complications were also more common among patients with delayed presentation. Complications occurred in 3 (4.69%) patients presenting within 24 hours and in 9 (21.95%) patients presenting after 24 hours, showing a significant association with delayed presentation, p=0.010. Intensive care admission was required in 3 (2.86%) patients overall, all of whom presented after 24 hours; however, this finding was not statistically significant, p=0.057. Hospital stay longer than 3 days was observed in 17 (16.19%) patients and was significantly more common in patients presenting after 24 hours, 13 (31.71%), compared with those presenting within 24 hours, 4 (6.25%), with p=0.001.

Table 1: Age and gender distribution of the study participants (N=105)

Age group	Male, n (%)	Female, n (%)	Total, n (%)
Below 3 years	29 (69.05%)	13 (30.95%)	42 (40.00%)
3–5 years	22 (70.97%)	9 (29.03%)	31 (29.52%)
6–10 years	10 (55.56%)	8 (44.44%)	18 (17.14%)
Above 10 years	7 (50.00%)	7 (50.00%)	14 (13.33%)
Total	68 (64.76%)	37 (35.24%)	105 (100.00%)

Pearson Chi-square test: χ^2=2.867, p=0.413. Percentages for males and females in individual age groups were calculated row-wise.

Table 2: Clinical presentation of patients with tracheo-bronchial foreign bodies (N=105)

Clinical feature	Number of patients	Percentage
Cough	92	87.62%
History of choking episode	81	77.14%
Wheezing	63	60.00%
Decreased breath sounds	58	55.24%
Dyspnea	47	44.76%
Fever	29	27.62%
Recurrent respiratory infection	24	22.86%
Stridor	18	17.14%
Cyanosis	9	8.57%

Table 3: Radiological findings according to age category (N=105)

Radiological finding	Below 5 years, n=73	5 years or above, n=32	Total, n (%)
Obstructive emphysema/hyperinflation	30 (41.10%)	9 (28.12%)	39 (37.14%)
Normal chest radiograph	13 (17.81%)	11 (34.38%)	24 (22.86%)
Atelectasis	12 (16.44%)	5 (15.62%)	17 (16.19%)
Consolidation	9 (12.33%)	4 (12.50%)	13 (12.38%)
Radio-opaque foreign body	5 (6.85%)	3 (9.38%)	8 (7.62%)
Mediastinal shift	4 (5.48%)	0 (0.00%)	4 (3.81%)
Total	73 (100.00%)	32 (100.00%)	105 (100.00%)

Normal versus abnormal chest radiograph: Fisher's exact test, p=0.079.

Table 4: Association between nature and anatomical location of foreign bodies (N=105)

Anatomical location	Organic foreign body, n (%)	Inorganic foreign body, n (%)	Total, n (%)
Right main bronchus	45 (80.36%)	11 (19.64%)	56 (53.33%)
Left main bronchus	24 (77.42%)	7 (22.58%)	31 (29.52%)
Trachea	4 (40.00%)	6 (60.00%)	10 (9.52%)
Segmental/bilateral bronchi	5 (62.50%)	3 (37.50%)	8 (7.62%)
Total	78 (74.29%)	27 (25.71%)	105 (100.00%)

Pearson Chi-square test: χ^2=7.976, p=0.047. Percentages for organic and inorganic foreign bodies in individual locations were calculated row-wise.

Table 5: Association of presentation delay with treatment outcomes (N=105)

Treatment outcome	Presentation within 24 hours, n=64	Presentation after 24 hours, n=41	Total, n (%)	p-value
First-attempt removal successful	62 (96.88%)	34 (82.93%)	96 (91.43%)	**0.026**
First-attempt removal unsuccessful	2 (3.12%)	7 (17.07%)	9 (8.57%)	
Complication present	3 (4.69%)	9 (21.95%)	12 (11.43%)	**0.010**
No complication	61 (95.31%)	32 (78.05%)	93 (88.57%)	
Intensive care admission	0 (0.00%)	3 (7.32%)	3 (2.86%)	0.057
No intensive care admission	64 (100.00%)	38 (92.68%)	102 (97.14%)	
Hospital stay longer than 3 days	4 (6.25%)	13 (31.71%)	17 (16.19%)	**0.001**
Hospital stay of 3 days or less	60 (93.75%)	28 (68.29%)	88 (83.81%)	

DISCUSSION

The present study demonstrated that tracheo-bronchial foreign bodies predominantly affected younger children. Of the 105 patients, 42 (40.00%) were younger than 3 years, while 73 (69.52%) were younger than 5 years. The proportion of cases declined progressively with increasing age, with 18 (17.14%) patients aged 6–10 years and 14 (13.33%) aged above 10 years. Rothmann et al. (1980), in a review of 225 paediatric airway foreign-body cases, reported that 77.00% of patients were 36 months of age or younger. The proportion of children below 3

years was therefore lower in the present study than the 77.00% reported by Rothmann et al.; nevertheless, both studies demonstrate that the greatest risk occurs during early childhood. This age-related vulnerability may be associated with oral exploration, immature swallowing coordination, incomplete dentition and the inability of young children to identify potentially hazardous objects.[7] A clear male predominance was observed in the present study, with 68 (64.76%) males and 37 (35.24%) females, giving a male-to-female ratio of approximately 1.84:1. Male predominance was evident in children below 3 years and those aged 3–5 years; however, the association between age category and gender was not statistically significant (χ^2=2.867, p=0.413). Saki et al. (2009), in their study of 1,015 patients, reported 644 (63.50%) males and 371 (36.50%) females, with a male-to-female ratio of 1.73:1. They also found that 556 (54.80%) patients were aged 1–3 years. Their gender distribution was remarkably similar to the present study, differing by only 1.26 percentage points for males. Male predominance may be related to relatively greater physical activity, exploratory behaviour and exposure to small objects, although the non-significant association in the present study indicates that gender distribution did not vary significantly across the age groups.[8] Cough was the most frequent clinical manifestation in the present study and occurred in 92 (87.62%) patients. A history of choking was obtained in 81 (77.14%), wheezing was observed in 63 (60.00%), decreased breath sounds in 58 (55.24%) and dyspnoea in 47 (44.76%) patients. Fever, recurrent respiratory infection, stridor and cyanosis were recorded in 27.62%, 22.86%, 17.14% and 8.57% of patients, respectively. Lakhkar et al. (2000) reported cough in 79.40% of their patients and a definite history of foreign-body aspiration in 86.50%. Thus, cough was more frequent in the present study, 87.62% versus 79.40%, whereas a history suggestive of aspiration or choking was less frequent, 77.14% versus 86.50%. The variation may reflect differences in whether aspiration was witnessed, the interval before presentation and the age-related ability to communicate the event. The high frequency of cough, choking, wheezing and reduced air entry in the present study indicates that the combination of history and respiratory examination remains important, particularly because no single clinical feature is present in every patient.[9] Radiological evaluation revealed obstructive emphysema or hyperinflation in 39 (37.14%) patients, making it the most common chest radiographic abnormality. Atelectasis was observed in 17 (16.19%), consolidation in 13 (12.38%), a radio-opaque foreign body in 8 (7.62%) and mediastinal shift in 4 (3.81%) patients. However, 24 (22.86%) patients had a normal chest radiograph, meaning that radiological abnormalities were present in 81 (77.14%).

Fraga et al. (2008) reported radiological abnormalities in 88.00% of 69 children, which was higher than the 77.14% recorded in the present study. Their findings also showed that normal radiography could occur despite clinical suspicion of aspiration. In the present study, normal radiographs were more frequent among patients aged 5 years or above than among those below 5 years, 34.38% versus 17.81%; however, the difference between normal and abnormal radiographs according to age was not statistically significant (p=0.079). These findings confirm that normal chest radiography cannot independently exclude a tracheo-bronchial foreign body when the history and clinical examination remain suggestive.[10] Organic foreign bodies constituted 78 (74.29%) cases in the present study, while inorganic foreign bodies accounted for 27 (25.71%). Mu et al. (1991), in a study of 400 Chinese children, reported that approximately 95.00% of the retrieved foreign bodies were organic. The proportion of organic foreign bodies was therefore 20.71 percentage points lower in the present study. Nevertheless, both studies show that organic materials form the principal category of aspirated foreign bodies in children. The difference may be explained by regional eating habits, the availability of nuts and seeds, feeding practices and children's exposure to metallic or plastic objects. Organic materials are clinically important

because they can absorb moisture, increase in size and provoke airway inflammation, potentially making delayed removal more difficult. The comparatively substantial proportion of inorganic foreign bodies in the present study may also explain why radio-opaque objects were visible in 7.62% of the radiographs.[11] The right main bronchus was the most frequent anatomical site in the present study, accounting for 56 (53.33%) cases, followed by the left main bronchus in 31 (29.52%), the trachea in 10 (9.52%) and segmental or bilateral bronchi in 8 (7.62%). Ahmed et al. (2014), in a Nigerian study of 35 children, found the left main bronchus to be the more frequent site, involving 8 (22.90%) patients, compared with the right main bronchus in 6 (17.10%). Their findings contrast with the right-sided predominance observed in the present study. Differences in sample size, the physical characteristics of the aspirated objects, patient age and airway anatomy may account for the variation. In the present study, organic foreign bodies predominated in the right and left main bronchi, whereas inorganic objects constituted 60.00% of tracheal foreign bodies. The association between the nature and anatomical location of the foreign body was statistically significant (χ^2=7.976, p=0.047), suggesting that the size, shape, weight and surface properties of an object may influence its eventual site of impaction.[12] Foreign-body removal during the first attempt was successful in 96 (91.43%) patients in the present study, while 9 (8.57%) required further intervention. The success rate was significantly higher among patients who presented within 24 hours than among those who presented later, 96.88% versus 82.93% (p=0.026).

Gang et al. (2012), in a large study of 1,024 children, reported successful extraction during the first bronchoscopic attempt in 948 cases, representing 99.70% of bronchoscopically confirmed cases, while only three patients required repeat bronchoscopy. The first-attempt success rate in their study was therefore higher than the 91.43% obtained in the present study. Differences may be related to the duration of foreign-body retention, associated mucosal oedema, granulation tissue, the nature of the aspirated material and institutional bronchoscopic experience. The significantly reduced success among patients presenting after 24 hours in the present study indicates that early diagnosis and intervention may facilitate removal before inflammatory changes make the procedure more difficult.[13]

Delayed presentation was associated with less favourable outcomes in the present study. Complications developed in 9 (21.95%) patients presenting after 24 hours compared with 3 (4.69%) presenting within 24 hours, and the difference was statistically significant (p=0.010). Intensive care admission was required in three delayed cases, although its association with presentation delay did not reach statistical significance (p=0.057). A hospital stay longer than 3 days occurred in 13 (31.71%) delayed cases compared with 4 (6.25%) early cases (p=0.001). Huang et al. (2013) similarly found a median diagnostic delay of 168 hours among referred patients compared with 24 hours among patients treated directly at their institution. Complications occurred in 155 of 261 referred patients (59.39%) compared with 24 of 79 directly treated patients (30.38%), representing a statistically significant difference (p<0.01). Although their complication rates were higher than the overall rate of 11.43% in the present study, both studies demonstrate a strong relationship between treatment delay and adverse clinical outcomes. Early referral, prompt bronchoscopy and availability of trained personnel are therefore important for reducing complications and prolonged hospitalization.[14]

CONCLUSION

Tracheo-bronchial foreign bodies were most commonly observed in male children below 5 years of age, with cough, choking, wheezing, and decreased breath sounds as the major clinical features. Organic foreign bodies

predominated, and the right main bronchus was the most frequent site of lodgement. Although chest radiography was useful, a normal radiograph did not exclude foreign body aspiration. Early presentation significantly improved first-attempt removal success and reduced complications and prolonged hospitalization. Prompt diagnosis, timely bronchoscopy, and increased caregiver awareness are essential to improve outcomes.

References

1. Boufersaoui A, Smati L, Benhalla KN, Boukari R, Smail S, Anik K, et al. Foreign body aspiration in children: experience from 2624 patients. Int J Pediatr Otorhinolaryngol. 2013;77(10):1683-8. doi: 10.1016/j.ijporl.2013.07.026.
2. Naragund AI, Mudhol RS, Harugop AS, Patil PH, Hajare PS, Metgudmath VV. Tracheo-bronchial foreign body aspiration in children: a one year descriptive study. Indian J Otolaryngol Head Neck Surg. 2014;66(Suppl 1):180-5. doi: 10.1007/s12070-011-0416-2.
3. Haddadi S, Marzban S, Nemati S, Ranjbar Kiakelayeh S, Parvizi A, Heidarzadeh A. Tracheobronchial foreign-bodies in children: a 7 year retrospective study. Iran J Otorhinolaryngol. 2015;27(82):377-85.
4. Manach Y, Pierrot S, Couloigner V, Ayari-Khalfallah S, Nicollas R, Venail F, et al. Diagnostic performance of multidetector computed tomography for foreign body aspiration in children. Int J Pediatr Otorhinolaryngol. 2013;77(5):808-12. doi: 10.1016/j.ijporl.2013.02.016.
5. Ganie FA, Wani ML, Ahangar AG, Lone GN, Singh S, Lone H, et al. The efficacy of rigid bronchoscopy for foreign body aspiration. Bull Emerg Trauma. 2014;2(1):52-4.
6. Janahi IA, Khan S, Chandra P, Al-Marri N, Saadoon A, Al-Naimi L, et al. A new clinical algorithm scoring for management of suspected foreign body aspiration in children. BMC Pulm Med. 2017;17(1):61. doi: 10.1186/s12890-017-0406-6.
7. Rothmann BF, Boeckman CR. Foreign bodies in the larynx and tracheobronchial tree in children: a review of 225 cases. Ann Otol Rhinol Laryngol. 1980;89(5 Pt 1):434-6. doi: 10.1177/000348948008900512.
8. Saki N, Nikakhlagh S, Rahim F, Abshirini H. Foreign body aspirations in infancy: a 20-year experience. Int J Med Sci. 2009;6(6):322-8. doi: 10.7150/ijms.6.322.
9. Lakhkar BB, Kini P, Shenoy V, Bhaskaranand N. Foreign body aspiration: Manipal experience. Indian Pediatr. 2000;37(2):193-5.
10. Fraga AMA, Reis MC, Zambon MP, Toro IC, Ribeiro JD, Baracat ECE. Foreign body aspiration in children: clinical aspects, radiological aspects and bronchoscopic treatment. J Bras Pneumol. 2008;34(2):74-82. doi: 10.1590/S1806-37132008000200003.
11. Mu L, He P, Sun D. Inhalation of foreign bodies in Chinese children: a review of 400 cases. Laryngoscope. 1991;101(6 Pt 1):657-60. doi: 10.1288/00005537-199106000-00014.
12. Ahmed AO, Shuiabu IY. Inhaled foreign bodies in a paediatric population at AKTH Kano-Nigeria. Niger Med J. 2014;55(1):77-82. doi: 10.4103/0300-1652.128178.
13. Gang W, Zhengxia P, Hongbo L, Yonggang L, Jiangtao D, Shengde W, et al. Diagnosis and treatment of tracheobronchial foreign bodies in 1024 children. J Pediatr Surg. 2012;47(11):2004-10. doi: 10.1016/j.jpedsurg.2012.07.036.
14. Huang Z, Liu D, Zhong J, Zhou J. Delayed diagnosis and treatment of foreign body aspiration in China: the roles played by physician inexperience and lack of bronchoscopy facilities at local treatment centers. Int J Pediatr Otorhinolaryngol. 2013;77(12):2019-22. doi: 10.1016/j.ijporl.2013.09.026.