Journal of Bangladesh College of Physicians and Surgeons
Vol. 44, No. 4, October 2026

Bronchoscopic Removal of Airway Foreign Bodies –An Experience in a Tertiary Care Hospital in Bangladesh

NK SARKAR[a], MMR MIA[b], MA HOQUE[c], K HIBARE[d]

Abstract:

Background: *Airway foreign body (FB) aspiration typically presents as a medical emergency which demands prompt intervention. This study was conducted with the aim to explore the clinical presentation, management and treatment outcomes of foreign body aspiration in our setting.*

Methods: *This prospective observational study was conducted at the National Institute of Diseases of the Chest and Hospital (NIDCH), Dhaka, Bangladesh between February, 2021, and April, 2025. Patients with confirmed or suspected history of FB aspiration were studied. Emergency or elective bronchoscopy was performed as per institution protocol. Clinical, radiographic, and bronchoscopic presentations, management details and outcomes were analyzed.*

Results: *One hundred and thirty-one bronchoscopic procedures among 122 patients between the age of 6 months to 62 years were analyzed. The highest incidence occurred among children younger than 2 years of age (32.78%). Vigorous cough (97.54%) was the most common presentation and in majority of the cases (93.4%), there was eye witness. Most common radiographic findings were radio-opaque shadow (56.56%) and unilateral hyperinflation (18.03%). Twenty-one different types of FBs were extracted from the airways, and hijab/scarf pin was an alarming concern. Nearly half (45.08%) of the aspirated FBs were located in the right bronchial tree during bronchoscopy, and right main bronchus was the commonest site (36.07%) of impaction. Rigid bronchoscopy was the most commonly used extraction procedure (91.8%). In majority of the cases, FBs were removed in single bronchoscopic session (91.8%). One patient needed surgical approach, and there was no death.*

Conclusions: *In a specialized center having experienced proceduralist and appropriate equipment, the success rate is very high in the management of airway foreign body.*

Keywords: *Airway foreign body, bronchoscopy, removal*

(J Bangladesh Coll Phys Surg 2026; 44: 243-251)
DOI: https://doi.org/10.3329/jbcps.v44i4.94409

Background:

Airway foreign body aspiration is a medical emergency requiring prompt intervention[1,2]. Though most of the cases present as an acute emergency, patient may be diagnosed incidentally during routine radiological examination or bronchoscopic procedure or may present many years later with respiratory complications[3,4]. Prevalence is more in the two extremes of ages and most vulnerable group is the children below five years of age[5,6]. Though relatively uncommon in adults, cases are found in elderly population especially with comorbidities, like neurological disorders, swallowing difficulties, dementia, alcohol intoxication, excessive use of sedative and hypnotic drugs[7,8].

Presentation depends on the age of the patient, types and size of FB aspirated, site of impaction, position of the patient during aspiration and so on. The classic triad of cough, wheeze and absent breath sound may not be found in all cases[9]. Therefore, a high index of clinical suspicion is essential especially where history is inadequate, eye-witness is absent and radiographic feature is not compatible.

Considering as a medical emergency, FB aspiration summons immediate intervention once the diagnosis is confirmed. Rigid bronchoscopy is the preferred tool especially in children, owing to its wide working channel and good suction facility. But this instrument is not suitable for the distally lodged FBs. Moreover, the procedure is costly, needs general anesthesia and the

a. Dr. Nirmal Kanti Sarkar, Assistant Professor, Department of Respiratory Medicine, National Institute of Burn and Plastic Surgery, Dhaka, Bangladesh
b. Dr. Md. Mofizur Rahman Mia, Professor, Department of Thoracic Surgery, Chittagong Medical College, Chattogram, Bangladesh
c. Dr. Mohammad Anamul Hoque, Assistant Registrar, Department of Surgery, Manikgangj Medical College, Manikganj, Bangladesh
d. Dr. Kedar Hibare, Lead Interventional Pulmonologist, Sparsh Hospital, Bangalore, India

Address of Correspondence: Dr. Nirmal Kanti Sarkar, Assistant Professor, Department of Respiratory Medicine, National Institute of Burn and Plastic Surgery, Dhaka, Bangladesh, E-mail: nirmalsarker@gmail.com

Received: 07 January, 2026 **Accepted:** 29 June, 2026

facility is available only in few centers in Bangladesh. With the advent of different caliber of flexible bronchoscope and wide arrays of accessories, this instrument is gaining popularity for FB extraction among all age groups. In the specialized centers with experienced operators the success rate is very high[10].

There is a paucity of data on airway foreign body aspiration in Bangladesh. Chowdhury et al. first published a retrospective study on respiratory foreign body covering only few points[11]. In a preliminary report with a small sample size, Sarkar et al. also focused on this issue[12]. This exploratory study has shed light on more details of FB aspiration.

Materials and Methods:

This prospective observational study was conducted at the National Institute of Diseases of the Chest and Hospital (NIDCH), Dhaka, Bangladesh, a tertiary care referral hospital and teaching institute for thoracic diseases. Between February, 2021, and April, 2025, consecutive patients with confirmed or suspected history of foreign body (FB) aspiration were enrolled. Emergency or elective bronchoscopy was performed either in Interventional Pulmonology or Thoracic Surgery department as per institution protocol. Rigid (Karl Storz; Tuttlingen, Germany) and flexible (Olympus BF-Q170 or BF-1 TQ170; Tokyo, Japan). bronchoscopy was the preferred tool for the participants aged ≤14 years and >14 years, respectively. The cases were reviewed for gender, age, clinical and radiological presentation, FB location during bronchoscopy, and the procedure performed. All patients were followed up for whether they had had any complications and finally the outcomes were analyzed (FB extracted in single or multiple bronchoscopic procedures). The study was approved by the Institutional Ethics Committee of NIDCH. Written informed consent was obtained from the patients or legal guardians.

Continuous variables were expressed as mean±SD or median (Interquartile range - IQR) and categorical variables as frequency and percentage. Association between categorical variables were analyzed using Pearson χ^2 test with Yate's correction. Statistical package for social sciences (SPSS) version 23.0 was used for statistical analysis of data. A p value <0.05 was considered statistically significant.

Results:

A total of 122 patients between the age of 6 months to 62 years and 131 bronchoscopic procedures were analyzed. All patients were referred to our center by primary physicians or peripheral hospitals following initial evaluation at the time of presentation. Our series included 113 patients ≤14 years and 9 patients >14 years. Total 131 procedures were performed by two thoracic surgeons and one interventional pulmonologist. The thoracic surgeons did the procedures in emergency operation theatre under general anesthesia by using rigid bronchoscope. The interventional pulmonologist performed the procedures in the bronchoscopy suite under conscious sedation using flexible bronchoscope. In special situations, both the operators worked together using rigid and flexible scopes in general operation theatre.

Gender and Age

There were 82 male (67.2%) and 40 female patients (32.79%). Male patients were more than two times that of the female counterparts. The median age was 5.0 years (IQR 1.5-11.0 years), with a range from 6 months to 62 years. The child group represented the majority (92.6%) of the total study population [Table-1]. The peak incidence of FB aspiration occurred below 2 years of age (32.78%) [Figure-1]. No age-wise discriminating factor was found in the adult group that might predispose these patients to FB aspiration, like neurological or neuromuscular diseases, swallowing disorder, dementia, psychiatric illness or alcohol intoxication etc.

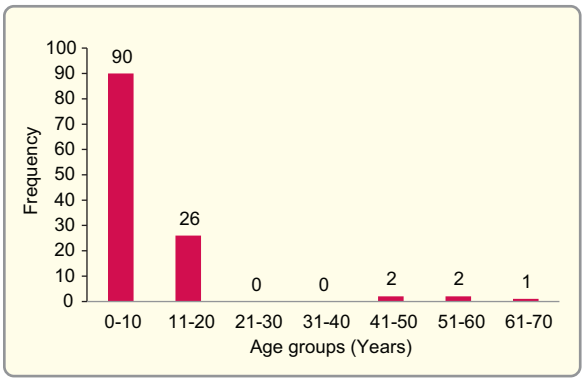


Figure-1: *The age distribution foreign body aspiration (n=122)*

Symptoms and Signs

The symptoms and signs associated with FB aspiration are outlined in the Table-1. The most common presenting complaint was vigorous cough (97.54%) starting just following aspiration. Other commonest features were breathlessness, wheeze and chest pain. Interestingly, only 4 patients complained choking sensation. Two patients presented with hemoptysis.

Eye-witness

In the majority of the cases (93.4%), there was eye-witness of aspiration [Table-1]. Eight patients were referred to our hospital with suspected aspiration or clinical or radiological feature suggestive of late complications of impacted FB (e.g., segmental collapse, localized bronchiectasis or unilateral hyperinflation).

Table-I

Demography and clinical presentation (n=122)

Characteristics	Frequency (%)
Demographic characteristics	
Age, median (IQR)	5.0 (1.5-11.0) years
Age, mean (±SD)	7.9 (±10.2) years
Range	6 months-62 years
Sex	
Male	82 (67.21)
Female	40 (32.79)
Eye-witness	
Yes	114 (93.44)
No	8 (6.56)
Symptoms*	
Cough	119 (97.54)
Breathlessness	38 (31.15)
Chest pain	32 (26.23)
Wheeze	30 (24.59)
Choking sensation	4 (3.28)
Fever	2 (1.64)
Hemoptysis	2 (1.64)
Stridor	1 (0.82)

*Not mutually exclusive

Radiographic Findings

Chest x-ray was done in all cases. The radiographic findings are depicted in Table-2. Most common findings were radio-opaque shadow (56.56%) followed by hyperinflation (18.03%). Other findings included segmental collapse (6.56%) and consolidation/ bronchiectatic changes (2.45%). The consolidation/ bronchiectatic changes were found in suspected cases of aspiration who had a history long back without any eye-witness and were referred by physicians for the evaluation of non-resolving pneumonia. Twenty patients had normal radiological findings where the extracted FBs were organic one.

Table-II

Radiographic (chest X-ray) findings

Chest X-ray findings	Frequency (%)
Radio-opaque shadow	69 (56.56)
Hyperinflation	22 (18.03)
Segmental collapse	8 (6.56)
Consolidation	3 (2.45)
Normal findings	20 (16.39)

Location of FB during Bronchoscopy

Table-3 shows the location of the aspirated FB at the time of removal. Fifty-five (45.08%) aspirated FBs were located in the right bronchial tree and 42 (34.42%) in the left bronchial tree. Most of the FBs were lodged in the proximal airways – trachea 23 cases (18.85%), right main bronchus 44 (36.07%) and left main bronchus 35 (28.69%). One case was found in glottis and bilateral FB was found in one patient.

Table-III

Location of aspirated foreign body during bronchoscopy

Location of FB	Frequency (%)
Glottis	1 (0.82)
Trachea	23 (18.85)
Right lung	55 (45.08)
Main bronchus	44 (36.07)
Lower lobar bronchus	9 (7.38)
Upper lobar bronchus	1 (0.82)
Intermedius bronchus	1 (0.82)
Left lung	42 (34.42)
Main bronchus	35 (28.69)
Lower lobar bronchus	5 (4.10)
Upper division bronchus	1 (0.82)
Lingula	1 (0.82)
Both lungs	1 (0.82)

Types of Foreign Body

Twenty-one different types of FBs were extracted from the airways [Table-4, Figure-2,3]. Metallic foreign bodies outnumbered the others (35 cases) excluding hijab pin. Hijab pin/scarf pin was studied under a separate heading owing to its high incidence (31 cases). Twenty-six cases of organic FBs were extracted, peanut was the commonest one. No meaningful difference was observed in FB types between males and females. Though bronchoscopic exploration found most of the FBs impacted in the right bronchial tree (55 cases, 45.08%), most of the hijab/scarf pins were located in the left bronchial tree (19 cases), which is statistically significant (p= 0.001) [Table-6].

FB Extraction Procedure

In one hundred and twelve cases (91.8%), FB was removed under general anesthesia using rigid bronchoscope of appropriate-size, equipped with a telescope (Hopkins zero-degree telescope; Karl Storz, Germany) and in rest of the cases by using flexible scope under conscious sedation [Table-5]. Rigid forceps (Alligator or peanut-type forceps; Karl Storz) were used as the extraction tool during rigid procedure. Foreign body removal forceps (Rat-toothed or tiger-toothed; Vedkang, China), two-prongs or three-prongs forceps (Olympus, Japan), and Dormia basket (Vedkang, China) were used during flexible bronchoscopic removal which one was applicable.

Table-IV

Types of aspirated foreign bodies (n=122)

Type of FB	Sex		*p*-value
	Male(n_1=82)	Female(n_2=40)	
Hijab/scarf pin	17 (20.73%)	14 (35.0%)	
Organic*	15 (18.29%)	11 (27.5%)	
Metallic¶	27 (32.93%)	8 (20.0%)	
Plastic materials§	14 (17.07%)	5 (12.5%)	0.725^{ns}
Denture	2 (2.44%)	1 (2.5%)	
Fish bone	3 (3.66%)	0 (0.0%)	
Toy battery	1 (1.22%)	0 (0.0%)	
Others^	3 (3.66%)	1 (2.5%)	

ns= not significant

p-value reached from chi square test with Yate's correction

*Organic (peanut, bean seed, corn seed, nut shell, pulse, tamarind seed)

¶Metallic (small and large pin, board pin, safety pin, screw, coin, hook)

§Plastic (flute, toy, back of pin, back of pen, plastic bulb with wire, bead)

^Others (foil of tablet, pen/pencil nib)

Table-V

FB removal procedure and outcomes

Removal procedure	Frequency (%)
Rigid bronchoscope	112 (91.80)
Flexible bronchoscope	10 (8.20)
Outcomes	
FB removed in single procedure	112 (91.80)
FB removed in multiple procedures	9 (7.38)
Failed bronchoscopic procedure (Needed thoracotomy)	1 (0.82)

Table-VI

Comparison of location of impacted FBs in airway (Hijab/scarf pin and others) (n=122)

Location of FB	FB type		p-value
	Hijab pin (n_1=31)	Others(n_2=91)	
Glottis	0 (0.0%)	1 (1.10%)	
Trachea	8 (25.81%)	15 (16.48%)	
Right lung	4 (12.90%)	51 (56.04%)	0.002[s]
Left lung	19 (61.29%)	23 (25.27%)	
Both lung	0 (0.0%)	1 (1.10%)	

s= significant

p-value reached from chi square test with Yate's correction



Figure-2: *Extracted foreign bodies (A, J – hijab pin, B – denture, C – chickpea, D, F, G – plastic bead, E – ear ring, H – spring, I – board pin, K – ring, L – battery)*

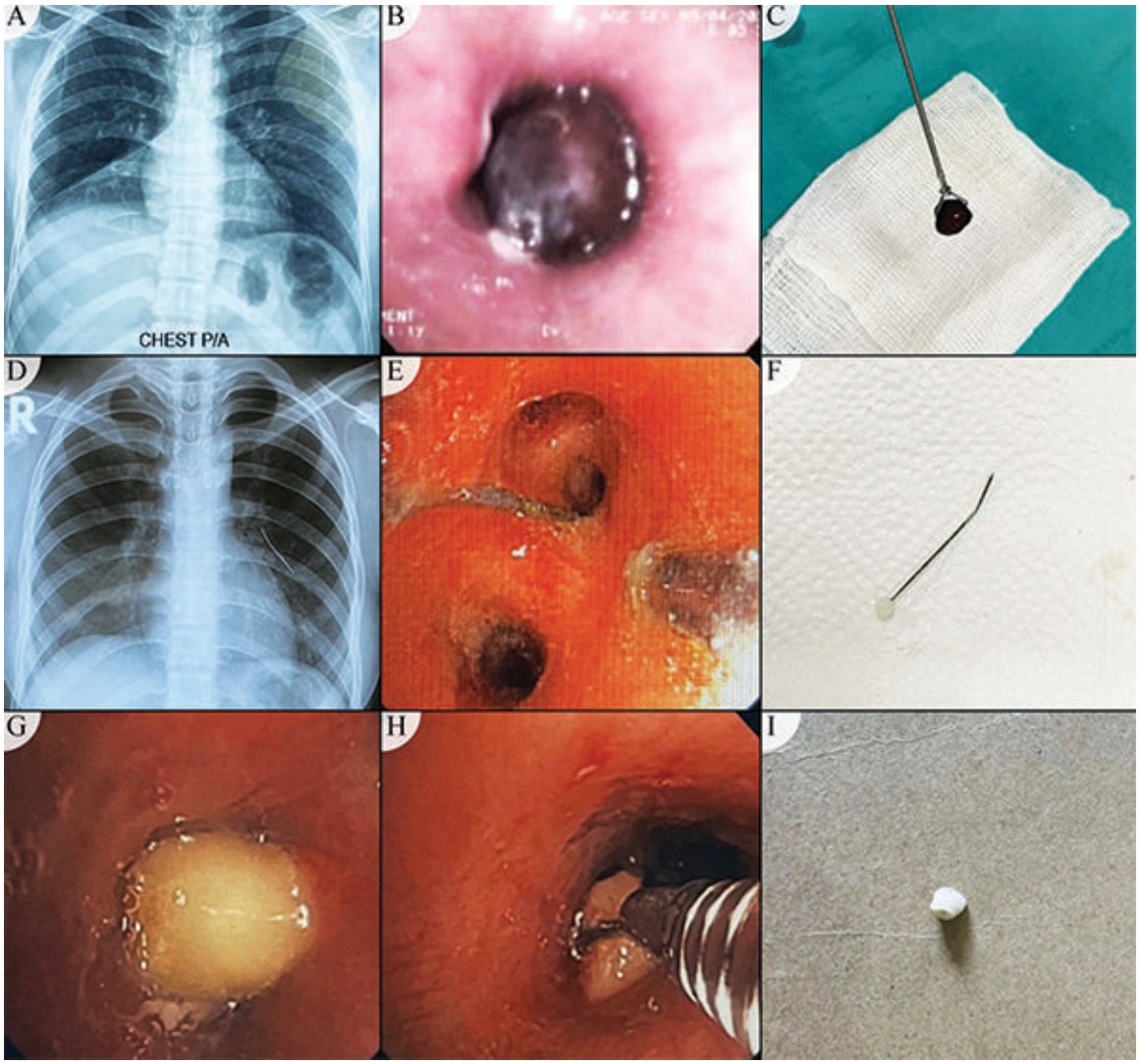


Figure-3: *Radiographic and bronchoscopic view of FBs (Upper row – A) right lower lobar collapse, B) FB (chickpea at the opening of right lower lobar bronchus, C) extracted chickpea; Middle row – D) Radio-opaque FB (hijab pin) in left lower zone, E) FB in left lower lobar bronchus, F) extracted hijab pin; Lower row – G) Denture in-situ (right lower lobar bronchus), H) FB grasped by 3-prong forceps, I) extracted denture)*

Complications and Outcomes

In majority of the= cases, FBs were removed in single bronchoscopic maneuver either flexible or rigid (91.8%). Nine cases (7.38%) needed multiple attempts [Table-5]. No major complications requiring intervention or prolonged hospitalization occurred. In one case, FB could not be removed bronchoscopically, and needed thoracotomy and bronchotomy. This patient's post-operative period was uneventful. There was no death.

Discussion:

Our study showed that FB aspiration was more common in children than adult and those below two-years of age were more vulnerable. This observation well matches with previous studies[1,13,14]. The possible explanation of higher frequencies among this group is – natural curiosity of the children, exploration of the world with mouth, and use of incisive teeth. Moreover, they laugh, talk, cry and play keeping food in mouth[15].Though Jang et al. found several predisposing factors (e.g., stroke,

Parkinson's disease, motor neuron disease etc.) in adult FB aspiration, in majority of the cases they did not find an underlying risk factor[3]. We also did not find any age-wise discriminating factor. Rather we observed that accidental aspiration or rushed eating were the underlying cause among this group.

We observed male patients outnumbered the female (67.2% versus 32.79%). Paneru et al. and Ayed et al. had the similar observations[14,16]. The possible explanation may be the impulsive and adventurous behavior of boys.

Foreign body aspiration may present in different ways as observed in our study. Cough was the most common presentation followed by breathlessness, chest pain and wheeze among our patients. Interestingly, choking was less commonly complained by them. Subjective interpretation of choking as chest pain and breathlessness by the participants may explain the lower reporting of choking. Fever and hemoptysis were found among those presented with late complications like pneumonia and localized bronchiectasis. As the classic triad of cough, wheeze and diminished breath sound may not be present in all cases, clinical suspicion is very important. A diagnostic model is proposed by Haller et al. emphasizing seven key features (sudden onset of choking, cyanosis, apnea, diminished breath sound, lung atelectasis, air trapping, and mediastinal shift) for identifying FB aspiration[17]. According to Haller's model, the presence of three of these features strongly support FB aspiration (accuracy 91%).

Eye-witness is the single most important clue that may confidently guide the diagnosis of FB aspiration. Moreover, it can help to detect the type of FB aspirated and make a plan for removal using appropriate instrument and accessories. As majority of the patients in our cohort had eye-witnesses (93.4%), planning for extraction could be done earlier.

Radio-opaque shadows were the most common finding on chest x-ray indicating their non-organic nature. Metallic FBs (especially hijab pins) were more frequent than in Western studies suggesting their cultural use during dressing in our part of the world. Chowdhury et al. found nearly one third of their patients had similar findings regarding metallic objects[11]. Air trapping or hyperinflation was the second most common radiographic finding, mostly observed among child group. Similar findings were observed by Baharloo et al.[1] We observed that more than sixteen percent (16.39%) patients had normal x-ray findings. Literature shows that normal radiographic picture may be found in variable range of patients (from 8% to more than 80%)[1,18-21]. So, in a patient with high clinical suspicion, a normal chest x-ray should not rule out the possibility of aspiration. In selective cases, CT scan of the chest can be done especially if there is feature of segmental collapse or localized bronchiectasis.

We extracted twenty-one different types of foreign bodies. Metallic FBs were the commonest one followed by hijab/scarf pins. This observation differs from other studies where organic FBs were the commonest one[1,14,22,23]. The third most common extracted particle were organic FBs. There was no gender wise discrimination of FB types. It is noteworthy that a significant proportion of our patients were victim of hijab pin/scarf pin aspiration. The type of foreign body aspiration may depend on geographical location, ethnicity, eating habit, age and sex. Being a Muslim predominant country where women use hijab/scarf pin and children plays with the pins taking from their mother or young ladies keep the pins in their mouth between upper and lower teeth while wearing hijab leading to accidental aspiration. Several studies from Middle-East showed that hijab pins were the most commonly aspirated FB[24,25,28].

Bronchoscopic exploration revealed that right bronchial tree was the most common site of FB lodgment as observed by other researchers[14,26,27]. We observed that most of the FBs were lodged in the proximal airway in children. Baharloo et al. proposed that small diameter of bronchial tree in children prevent the movement of FB more distally[1]. But if the FB is small enough like small grain or pieces of nuts, it may move to distal airways. We had an interesting and statistically significant observation regarding hijab/scarf pin. In contrast to other FBs, hijab pins were mostly found in left side. This finding matches with the findings by the others[24,25,28]. Baram et al. proposed that this left-side predominance may be due to narrow lumen of left main bronchus leading to strong negative pressure during inspiration[28]. We suggest a different hypothesis – as the hijab pins are large enough (2.5 cm or more) with a rounded metallic or plastic end, it goes into right main bronchus first, favored by right bronchial anatomy and gravity dependent movement. We speculate that

vigorous coughing after initial aspiration may contribute to migration of the pin within the tracheobronchial tree. However, this hypothesis requires confirmation through fluoroscopic or dynamic imaging studies. We found one case in both lungs indicating the necessity of thorough exploration of both bronchial trees during bronchoscopy.

In majority of the cases, FBs were removed in single bronchoscopic maneuver either flexible or rigid. Nine cases needed multiple attempts. Rigid bronchoscope was the preferred tool (91.8%) for the children as practiced by others[14,29,30]. The low use of flexible bronchoscopy reflects institutional practice patterns and pediatric airway considerations rather than inferiority of the technique. In two cases, metallic FB (hijab pin) was deeply impacted into the airway wall. The sharp end was directed upwards with bended upper one third of the pin. In both cases, the pin was gently pushed downwards to release the proximal part and then removed with forceps. Three cases of organic FBs (nuts and myrobalan) were found big enough that couldn't be grasped with a forceps or basket in toto. The FBs were broken down using rigid forceps and then removed in piecemeal. There was a failed case of bronchoscopic removal that needed surgery. The case was a metal rod which was initially found in the bronchus intermedius. In first attempt, while approached through rigid scope, the rod was pushed down in lower lobar bronchus (RB9). Another two attempts were taken to remove it, but unfortunately the metal rod was slipped and pushed more distally obscuring the visual. Thoracotomy and bronchotomy was done and the metal rod was lastly found in the distal RB9.

The strength of our study is its prospective design, giving a real-world picture. We tracked the patients from presentation to management and followed them up till discharge. Hence the short-term outcome and development of any complication could be identified. As a tertiary referral center, our cohort may represent more severe or complex cases, which may limit generalizability of the study. To the best of our knowledge, this is the first prospective study on FB aspiration from this region.

Conclusion:

We conclude that any substance that can be put in mouth may be aspirated, and no age is immune to FB aspiration. With a compatible history and eye-witness, airways should be explored thoroughly even the radiograph is normal. Though right bronchial tree is the commonest site for FB lodgment, the theory may not always fit for the children. Hijab pin/scarf pin aspiration is an emerging concern in children and younger group in both male and female in our country. Public awareness should be disseminated on this issue. Our bronchoscopic success rate compares favorably with that reported in large series.

Disclaimer:

The abstract of this paper was presented at the 23rd World Congress for Bronchology and Interventional Pulmonology (WCBIP), held on 23-25 October 2024, Bali, Indonesia.

Conflict of interest:

There is no potential conflict of interest to declare.

Funding:

None

Author contribution:

Conceptualization – NKS, MMRM, KH

Data curation – MAH, NKS

Procedure done by – NKS, MMRM, MAH

Writing (original draft) – NKS, KH

Writing (review and editing) – NKS, MMRM, MAH, KH

References:

1. Baharloo F, Veyckemans F, Francis C, Biettlot M-P, Rodenstein DO. Tracheobronchial foreign bodies: presentation and management in children and adults. Chest. 1999; 115(5):1357–62. https://doi.org/10. 1378/chest.115.5.1357.
2. Casalini AG, Majori M, Anghinolfi M, Burlone E, D'Ippolito R, Toschi M, et al. Foreign body aspiration in adults and in children: advantages and consequences of a dedicated protocol in our 30-year experience. J Bronchology Interv Pulmonol. 2013; 20(4):313–21. https://doi.org/10.1097/LBR. 0000000000000024.
3. Jang G, Song JE, Kim HJ, Kim EJ, Jang JG, Cha SI. Foreign-body aspiration into lower airways in adults; multicenter study. PLoS ONE. 2022; 17(7): e0269493. https://doi.org/10. 1371/journal.pone.0269493
4. al-Majed SA, Ashour M, al-Mobeireek AF, al-Hajjal MS, Alzeer AH, al-Kattan K. Overlooked inhaled foreign bodies: late sequelae and the likelihood of recovery. Respir Med 1997; 91:293–6.

5. Mcguirt WF, Holmes KD, Feehs R, Browne JD. Tracheobronchial foreign bodies. The Laryngoscope. 1988; 98(6):615–8. https://doi.org/10.1288/00005537-198806000-00007.

6. Chen C-H, Lai C-L, Tsai T-T, Lee Y-C, Perng R-P. Foreign body aspiration into the lower airway in Chinese adults. Chest. 1997; 112(1):129–33. https://doi.org/10.1378/chest.112.1.129.

7. Cunanan OS. The flexible fiberoptic bronchoscope in foreign body removal: experience in 300 cases. Chest. 1978; 73(5):725–6.

8. Sehgal IS, Dhooria S, Ram B, Singh N, Aggarwal AN, Gupta D, et al. Foreign Body Inhalation in the Adult Population: Experience of 25,998 Bronchoscopies and Systematic Review of the Literature. Respir Care. 2015; 60(10):1438–48. https://doi.org/10.4187/respcare.03976.

9. Wiseman NE. The diagnosis of foreign body aspiration in childhood. J Pediatr Surg. 1984; 19:531-5.

10. Ma W, Hu J, Yang M, Yang Y, Xu M. Application of flexible fiberoptic bronchoscopy in the removal of adult airway foreign body. BMC Surg. 20, 165(2020). https://doi.org/10.1186/S 12893-020-00825-5.

11. Chowdhury GMA, Haque AKMA, Rahman Z, Kabir ARML, Amin R, Uddin NT. Management of respiratory foreign body – A twelve years' experience with 382 cases. Bangladesh J Child Health. 2006; 30(1/2/3):12-6.

12. Sarkar NK, Hoque MA, Mia MMR. Airway foreign body – A preliminary report from a tertiary care referral hospital in Bangladesh. Respirology. 2023; 28(Suppl. 1): 340-1.

13. Gregori D, Salerni L, Scrinzi C, Morra B, Berchialla P, Snidero S, et al. ESFBI Study Group. Foreign bodies in the upper airways causing complications and requiring hospitalization in children aged 0-14 years: results from the ESFBI study. Eur Arch Otorhinolaryngol. 2008; 265 (8): 971-8.

14. Paneru M, Nepal A, Yadav D, Dangol B, Shrestha N, Maharajan L, et al. Profile of pediatric patients with foreign body aspiration requiring bronchoscopy in a tertiary care center. Kathmandu Univ Med J. 2025; 23(3): 23-8.

15. Ernst A, Herth FJF, editors. Foreign body removal. In: Principles and Practice of Interventional Pulmonology. New York, Springer Science, 2013: 477-8.

16. Ayed AK, Jafar AM, Owayed A. Foreign body aspiration in children: diagnosis and treatment. Pediatr Surg Int. 2003; 19(6): 485-8.

17. Haller L, Barazzone-Argiroffo C, Vidal I, Corbelli R, Anooshiravani-Dumont M, Mornand A. Safely decreasing rigid bronchoscopies or foreign-body aspiration in children: An algorithm for the emergency department. Eur J Pediatr Surg. 2018; 28(3): 273-8. https://doi: 10.1055/s-0037-1603523.

18. Burton EM, Brick WG, Hall JD, et al. Tracheobronchial foreign body aspiration in children. South Med J. 1996; 89:195–8.

19. Black RE, Johnson DG, Matlak ME. Bronchoscopic removal of aspirated foreign bodies in children. J Pediatr Surg. 1994; 29: 682– 4.

20. Mu L, He P, Sun D. Inhalation of foreign bodies in Chinese children: a review of 400 cases. Laryngoscope. 1991; 101:657– 60.

21. Lan RS. Non-asphyxiating tracheobronchial foreign bodies in adults. Eur Respir J. 1994; 7:510 –4.

22. Parameswaran N, Das S, Biswal N. Respiratory morbidity following foreign body aspiration among South Indian children: a descriptive study. Cureus. 2018; 23(10): e3629. https://doi: 10.7759/cureus.3629.

23. Chiu CY, Wang KS, Lai SH, Hsia SH, Wu CT. Factors predicting early diagnosis of foreign body aspiration in children. Pediatr Emerg Care. 2005; 21(3): 161-4.

24. Al-Ali MA, Khassawneh B, Alzoubi F. Utility of fiberoptic bronchoscopy for retrieval of aspirated headscarf pins. Respiration. 2007; 74(3): 309-13. https://doi: 10.1159/000098477.

25. Al-Sarraf N, Jamal-Eddine H, Khaja F, Ayed AK. Headscarf pin tracheobronchial aspiration: a distinct clinical entity. Interact Cardiovasc Thorac Surg. 2009; 9(2):187-90. https://doi: 10.1510/icvts.2009.207548.

26. Kaur K, Sonkhya N, Bapna AS. Foreign bodies in the tracheobronchial tree: A prospective study of fifty cases. Indian J Otolaryngol Head Neck Surg. 2002; 54(1): 30-4. https://doi: 10.1007/BF02911002.

27. Cassol V, Pereira AM, Zorzela LM, Becker MM, Barreto SS. Foreign bodies in children's airways. J Bras Pneumol. 2003; 29: 139-4. https://doi:10.1590/S0102-35862003000300005.

28. Baram A, Kakamad FH, Bakir DA. Scarf-pin related hijab syndrome: A new name for an unusual type of foreign body aspiration. J Inter Med Research. 2017; 45(6): 2078-84. https://doi: 10.1177/0300060517711086.

29. Deskin R, Young G, Hoffman R. Management of pediatric aspirated foreign bodies. Laryngoscope. 1997; 107(4): 540-3.

30. Martinot A, Cosset M, Marquette CH, Hue V, Deschildre A, Ramon P, et al. Indication of flexible versus rigid bronchoscope in children in suspected foreign-body aspiration. Am J Respir Crit Care Med. 1997; 155(5): 1676-9. https://doi:10.1164/ajrccm.155.5.9154875.