

DELAY IN DIAGNOSIS OF FOREIGN BODY ASPIRATION IN CHILDREN

Fuad Brkić, Šekib Umihanić, Hasan Altumbabić, Nehra Mosorović

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DELAY IN DIAGNOSIS OF FOREIGN
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Authors:
Fuad Brkić^{1,2}, Šekib Umihanić^{1,2},
Hasan Altumbabić¹, Nehra Mosorović²

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Introduction: This study aims to compare the early and late diagnosis of foreign body aspiration (FBA) in children.

Patients and methods: A pediatric rigid bronchoscope under general anesthesia was used to identify and extract the foreign body in 48 children up to 14 years old. A retrospective review of a 4-year experience (from 2011 to 2014) in ENT Clinic Tuzla, Bosnia and Herzegovina.

Results: There were slight prevalence of boys, the majority were up to three years, average time for bronchoscopy was 90.7 hours. There was not significant difference between timing for bronchoscopy for children under and above three years. Near 100% children had timing for bronchoscopy less than one week.

Conclusion: Delay in diagnosis of foreign body aspiration can produce morbidity in children and foreign body aspiration always has to be in mind when children have cough like main symptom. Early referral of patients following foreign body aspiration should be encouraged.

Key words: foreign body aspiration, children, diagnosis, delay.

INTRODUCTION

Foreign body aspiration (FBA) is one of the major causes of persistent respiratory symptoms in children, yet is commonly missed by physicians (Chik, 2009). Usually, there is a suggestive history of choking, although the classic clinical presentation, with coughing, wheezing, and diminished air inflow, is seen in less than 40% of the patients (de Oliveira, 2002). Delayed presentations of FBA still are common. Delayed presentation often reflects a low index of suspicion leading to delay in referrals from primary health care centers or traditional healers.

The diagnostic delay could be attributed to physician misdiagnosis, failure by parents to seek early medical advice, patients left against medical advice, and the unknown cause of delay (Saquib Mallik, 2005). Foreign body aspiration can be misdiagnosed as asthma, upper respiratory tract infection, pneumonia, or croup. An asymptomatic period is common after aspiration and contributes to a delay in diagnosis of greater than one week in 12% to 26% of patients (Fitzpatrick, 1998). Delay in diagnosis is associated with increased morbidity, especially respiratory infection (Hillard, 2003). Aspiration of foreign bodies is a common accident during childhood. In its diagnosis, both an accurate clinical history and a high degree of suspicion must be taken

into account. Without an early diagnosis and its correct treatment, it remains a major cause of morbidity and mortality in children (Perez Prado 1996).

PATIENTS AND METHODS

During the period January 2011 to August 2014, 48 children were suspected of foreign body aspiration. A pediatric rigid bronchoscopy under general anesthesia was used to identify and extract the foreign body. There were 25 boys (52%) and 23 girls (48%). The ages of children were: under 1 year 10 children (20.9%), 1-2 years 19 (39.6%), 2-3 years 7 children (14.6%) and above 3 years 12 children (25%). Every child had a chart with following data: age, sex, time between possible aspiration and performed bronchoscopy, bronchoscopy findings (positive or negative), location and nature of extracted foreign body.

RESULTS

Foreign body were found in 22 children (45.8%). The location of extracted foreign body was: right main bronchus 20 (68.2%), left main bronchus 5 (22.7%) and more locations 2 (9.1%). The type of extracted foreign body were organic in most cases and located in right main bronchus in most cases (Table 1).

Affiliations:

¹ENT Clinic, University clinical center Tuzla, ²Medical faculty Tuzla, 75000 Tuzla, Bosnia and Herzegovina

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Corresponding author:

Fuad Brkić
ENT Clinic, University clinical center Tuzla, Medical faculty Tuzla, 75000 Tuzla, Bosnia and Herzegovina
Email: fuad.brkic@ukctuzla.ba

Table 1. Main characteristics of children underwent bronchoscopy

Year	Sex M/F (N/%)	Age (months)/ min-max	Timing (hours) min-max	Positive finding- % (male/female)	Location (RMB, LMB, ML)*	Type of FB (organic/non-organic)	Main physical symptom (%)
2011	8/8	30.3 8-112	42.4 1-120	43.8 4/3	3/2/2	6/1	Cough 81.3
2012	7/6	30.5 4-116	230.2 1-744	38.5 3/2	3/2/0	5/0	Cough 92.3
2013	8/7	35.9 8-112	51.4 1-240	53.3 4/4	8/0/0	7/0	Cough 100
2014	2/2	22 1-28	43.0 1-168	50 2/0	1/1/0	2/0	Cough 100
TOTAL	25/23 52/48	29.7 4-116	90.7 1-744	45.8 13/9	20/2/0	20/2	Cough 93.4

*RMB- right main bronchus, LMB- left main bronchus, ML- more locations

The most children were under three years old and there was not significant difference in timing of bronchoscopy between children with FBA under and above three years (Table 2).

Table 2. The age of children and timing for tracheobronchoscopy

Age (years)	TOTAL (N/%)	Timing (hours)
< 3	36 (75)	52.2
>3	12 (25)	59.8

If we account that early diagnosis of FBA for time under 24 hours, 50% of children are in this group, and time of less than 7 days for diagnosis cover near of 100% of children (Table 3).

Table 3. Distribution of patients according to time of diagnosis

Diagnosis	Number of patients	Percentages
Early		
<24 hours	24	50
1 to 7 days	22	45.8
< 7 days	46	95.8
Delayed		
>14 days	5	10.4

Table 4. Comparison of results of different authors (%)

Early diagnosis	< 24 hours	< 7days	0-14 days	< 1 month
	Boufersaoui 9.2	Chik 59	Mallick 69.7	
	Rizk 29	Rizk 49		
	Higuchi 50.9	Senkaya 57.2		
	Roda 39			
	Wiseman 46			
	Fraga 37.7			
Delayed diagnosis	2-8 days	>7 days	> 14 days	> 1 month
	Boufersaoui 65.8	Chik 41	Mallick 30.3	Saquib Mallick 21.8
		Fitzpatrick 12-26		

DISCUSSION

Foreign body aspiration is a very frequently occurring situation in pediatric practice; however, it is not always immediately diagnosed, partly because this diagnosis is not frequently in mind, but also because FBA does

not have a specific clinical manifestation. FBA can be result in a great variety of symptoms of varying severity, or it even can be completely asymptomatic. These differences stem in part from a variety of diverse cultural, social and economic factors that include the

parents' attitudes, eating habits, the availability and types of potentially threatening objects, and prevention strategies. Sometimes, FBA can be completely asymptomatic (de Oliveira, 2002).

The major issues involve the accurate diagnosis and speedy and safe removal of the foreign bodies. Accurate diagnosis may be delayed as often the initial choking episode is not witnessed and the delayed residual symptoms may be minimal. The symptoms and signs produced depend upon the nature size, location and time since lodgment of the foreign body in the tracheobronchial tree (Falase, 2013).

Delay of diagnosis of foreign body aspiration has not correct definition. Most of authors said that there are early diagnosis and delay diagnosis of FBA. Usually, early diagnosis means that bronchoscopy will be performed up to 24 hours from suspicion of aspiration, or appearance of first symptoms of possible aspiration. If aspiration has been witnessed, the time for making diagnosis can be very short. In one study, 73% of patients presented within two hours of aspiration (Adegboye et al, 2003).

The diagnosis of FBA is not always easy, since, in most cases, parents do not witness the accident and suspicion must be raised based on clinical history, symptoms (sudden-onset cough and choking) and clinical signs (wheezing during auscultation and respiratory discomfort). Studies conducted at referral centers show that most patients with suspicion of FBA present for treatment within 24 h after the accident. Onotai et al. reported that 68.75% of their patients presented more than 24 hours after aspiration, and 91.7% of patients have the same time in study of Falase (2013). 37.7% of the patients were admitted within the first 24 h after the event, showing that, in the health system of the region, there is an appropriate hierarchy for the admission of patients suffering this type of accident (Fraga, 2008). Delayed presentation is associated with a 2.5 times higher rate of serious acute complications than when the TFB is diagnosed early (Falase, 2013).

The interval between the occurrence of the event and admission to the UE-Ped ranged from 1 h to 60 days (Fraga, 2008). The same authors stated that in a study conducted in Canada, the interval between FBA and the diagnosis was longer than 30 days in 17% of the patients. In a study conducted in Israel, 47% of the diagnoses were delayed from 1 day to 1 month. In a study conducted in China, 28.7% of the cases were diagnosed after 7 days, and 6.8% were diagnosed after 1 month.

In children with an unequivocal choking event while eating even with normal physical and radiographic findings, FBA requires to be excluded by thorough investigations in such instances. Similarly, in toddlers with unexplained persistent cough with refractory parenchymal infiltrates, unrecognized FBA should also be considered. A witnessed choking event is the most important historical information to make an early diagnosis of FBA (Chiu 2005). The diagnosis of foreign body aspiration is too often missed, and that, apart

from bronchoscopy, diagnostic tools are of little value (Hoeve 1993).

The object of the review is to examine diagnostic accuracy and to differentiate between the clinical features of patients diagnosed early (within 24 hours) and late (beyond 24 hours) following the onset of symptoms (Wiseman 1984). In 80% of patients there was a history of witnessed choking, however, only 46% were diagnosed early. The diagnostic triad of wheezing, coughing, and decreased breath sounds was more common in late diagnoses (47%) than in early diagnoses (31%). The triad was incomplete in 61% of all patients. Although diagnoses can be made early; more than half of the patients were diagnosed late when there was evidence of significant airway obstruction. Twenty-eight patients out of 128 patients presented late (>1 month) (Saqub Mallick M, 2005).

A significant tissue reaction with inflammation and postbronchoscopic complications were more common in the delayed cases (Ibrahim Sersar, 2005). No complications were observed when the patients presented to the hospital within the first 24 hours after the aspiration while fever, purulent sputum, haemoptysis and bronchiectasis were noted in those presented later (Sirmali 2005).

Paying medical attention within the first 24 hours after the aspiration of foreign bodies is critical in order to accomplish a complication-free course. In children with chronic pulmonary infection and/atelectasis without a definite history of FBA near one quarter of them had confirmed foreign body and 17% of them developed complications. Cases with late presentation and chronic pulmonary infection are at high risk. In this group care should be take in determining the indication and timing of bronchoscopy in order to prevent life-threatening complications (Emir 2001).

In one study, the mean age of children with suspected FBA was 3 years and 2 months, the majority of the patients were between 1 and 3 years of age (56%), 59% of the patients were boys and the mean of evolution of symptoms before the broncoscopy was 3 months and 3 weeks. Foreign body was found in 17 cases (23.2%). The FBs were in 88.2% of the cases of vegetable origin. A granulation tissue was associated in 47% of positive bronchoscopies (Krifa, 2009). Organic foreign bodies and retention period of 30 days and over, constitute major risk factors in the development of bronchiectasis (Sirmali 2005), but children with a FB do not seem to be predisposed to the development of asthma (Twiggs, 1984).

After examining the results of different authors and related to the time of performing bronshoscopy in children with suspected foreign body aspiration (Table 4), one can see a patchwork of values, which can lead to confusion. It is not clear whether early diagnosis can be considered, each one performed up to 24 hours from the time of (possible) aspirations, or late (delayed) diagnosis can be considered every one that is carried out after, say, seven or more days? Or perhaps a better criterion for delayed diagnosis of foreign body

aspiration every one aspiration (or bronchoscopy), which results in even minimal complications (local or systemic)? In any case, foreign body aspiration in children can pose a serious health problem, and if even the slightest doubt about it, it is necessary to perform bronchoscopy, preferably with as experienced personnel and quality equipment.

CONCLUSION

Clinical and radiological findings of FBA in delayed cases may mimic other disorders, and the clinician must be aware of the likelihood of FBA. It is advisable to perform bronchoscopy in the early stages of all suspected cases to avoid serious complications.

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