Original Article

Foreign Body Aspiration in Children

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ABSTRACT

Introduction: Foreign body aspiration is one of the pediatric respiratory emergencies occurring especially in younger age (b/w 1-5 years) group leading significant morbidity & mortality The signs and symptoms of foreign body aspiration are quite variable depends on the age, the type of object, site, and the elapsed time since the event. The radiological investigations are not helpful in detection of non-metallic organic foreign bodies like peanuts, beetle nut and seeds. Comparing with foreign literature type of foreign body is peanut and plastic materials. Bronchoscopy is the best intervention for diagnosis and remedy of foreign body.

Objective: The purpose of our study is to evaluate clinical, radiological & bronchoscopic findings.

Study Design: Retrospective study

Materials & Methods: A retrospective study carried out from January 2010 to December 2011 in pediatric surgery department at PUMHS, Nawabshah on 150 patients with foreign body in airway. We reviewed the demographics, clinical presentation, X-ray chest & bronchoscopic findings.

Results: Results were analyzed & there was male predominance (n=90). The majority cases seen b/w 2-3 yrs. (n=47) & most common symptom was cough & dyspnea (n=80) with 95 patients had decrease breath sounds. On x-ray chest only 91 cases had significant findings. Betel nut (n=110) was the most common foreign body retrieved.

Conclusion: The successful diagnosis & treatment of this problem requires awareness & highest degree of suspicion of signs and symptoms of foreign body aspiration as it can mimic other pathological conditions such as croup, pneumonia and asthma, it is sometimes mismanaged. Rigid bronchoscopy is very effective procedure with less complication.

Key words: Foreign body, Children, Rigid Bronchoscopy

INTRODUCTION

Foreign body aspiration is one of the pediatric respiratory emergencies occurring especially in younger age group leading significant morbidity & mortality.[1, 2, 3] statistically it has been reported that, in US 7% death under 4years of age is due to foreign body aspiration & every year in Italy 400 cases occur.[4, 5] & 3rd leading cause of death in brazil[6].

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Children less than 5 years are more at risk of aspiration as this is the age child explore environment & have easy access to small objects so they put everything in their mouth while playing, along with that their swallowing coordination is poor & lacking molar teeth.[7]

Foreign body aspiration has quite variability in clinical presentation & depends on nature, size, location & duration of event. So high index of suspicion is required as usually history of aspiration is lacking & radiological investigations are sometimes inconclusive. Rigid bronchoscopy is not only diagnostic but therapeutic[8, 9] with fewer complications. The purpose of our study is to evaluate clinical, radiological & bronchoscopic findings.

MATERIAL & METHODS:

This 2 year retrospective study conducted at pediatric surgery department PUMHS, Nawabshah from January 2010 to December 2011 on 150

patients including who were having positive history of foreign body aspiration & those who were not responding to conservative treatment for pneumonia, collapse lung, persistent cough.
Detailed history & clinical examination was carried out. Plain x-ray chest were done in all case except those who presented in emergency situations & positive history of foreign body inhalation. Written consent was taken for rigid bronchoscopy under general anesthesia & size of bronchoscope selected according to age. Postoperative recovery was uneventful & patients were observed for 24hrs for any further complications.

We reviewed the demographic data, clinical presentation, radiologic features & bronchoscopic findings.

RESULTS:

The total of 150 cases included in the study, 90 were males & 60 females having ratio 1.5:1(Fig-1). Age ranged under 8 years with a mean of 4. Majority of patients were b/w 2-3 years (n=47) in our study we have seen few cases less than 1 year.

On looking to clinical features, cough & dyspnea were most prominent which seen in 80 cases (53.33%) with next frequent presentation recurrent RTI in 66 cases (44%) & choking in 48 cases (32%).Out of 150 cases, only 54 (36%) had positive history of foreign body aspiration. On examination 63.33% (n=95) patients had diminished/absent breath sounds (Table: 1).

Unilateral hyperinflation seen in 70 cases (46.6%), collapse lung in 15 cases (10%), foreign body visible only in 6 cases (4%) shown in (Fig-3 &_4) & 29 patients (19.3%) had normal chest x-rays (Table: 2).

In 70 cases of the 150 (46.6%) foreign body retrieved from right main bronchus, in 40 (26.6%) from left main bronchus, in 15 (10%) from trachea & in 10 cases although there was positive history of foreign body inhalation but no foreign body found only mucus plugs were present which was aspirated (Table: 3). Three cases were expired & no major postoperative complication seen in 147 cases & they were discharged after 1-2 days.

Most common foreign body retrieved was betel nut in 110 cases (73.3%).peanuts in 8 cases (5.3%), whistle in 6 cases (4%), seeds in 7 cases (4.6%) & rest of the types of foreign bodies aspirated presented in (Table:4)

DISCUSSION:

Foreign body aspiration in children is a preventable life threatening condition, which is associated with significant high morbidity. Our data showed male predominance with 2:1 ratio because of adventurous nature of boys & younger than 3 years are more commonly affected which is reported in most of international[5, 7, 10, 11] & national[9, 12, 13] literatures.

With regard to clinical presentation, it's not easy to establish diagnosis of foreign body aspiration until there is positive history of aspiration witnessed by parents & patients may be managed for prolonged period for common respiratory problems like pneumonia, asthma, allergy etc. So careful history & physical examination are strong predictors of diagnosis[14]

In our study, 36% patients had positive history of foreign body aspiration & 64% had no history that is nearly same with other study[10]. The most common clinical manifestations in our study was cough, dyspnea, recurrent respiratory tract infections, choking, diminish breath sounds on auscultation that is quite similar with the findings in the literature[7-9, 13, 15, 16].

Most of the foreign bodies are radiolucent & x-ray chest is an essential investigation, but is not conclusive most of times[14] having low specificity & can show normal findings despite foreign body is inhaled. In our study, 19.3% patient had normal findings on x-ray chest as reported in literature varies from 12-34%[5, 17, 18]. Unilateral hyperinflation was the frequent finding as reported in literature[7, 9, 15] & other subsequent finding on x-ray was collapse lung. Only in 4% patient had visible foreign bodies.

Bronchoscopy is gold standard for diagnosis & removal of inhaled foreign body in case of suspicious history & negative radiological findings. In our study, we removed most of the foreign bodies from right bronchus (46.6%) with next frequent site was left bronchus (26.6%) this increased frequency on right side is due to anatomically vertical alignment & large diameter[7,14,16,19,20].

According to literature, type of foreign body is different from region to region depends on cultural customs, socioeconomic status of country. In European countries most common foreign bodies are organic in nature like peanuts, groundnuts, dried nuts[21, 22, 23]. In our study betel nut was the common foreign body removed followed by peanuts as betel nut is easily available in Pakistan[9, 24].

CONCLUSION :

Negative history, no positive clinical findings & negative x-ray findings doesn't exclude foreign body aspiration. Successful diagnosis & treatment of this problem requires awareness & highest degree of suspicion. Family suspects important parameter that indicates foreign body located in airway. Rigid bronchoscopy is very effective procedure with fewer complications.

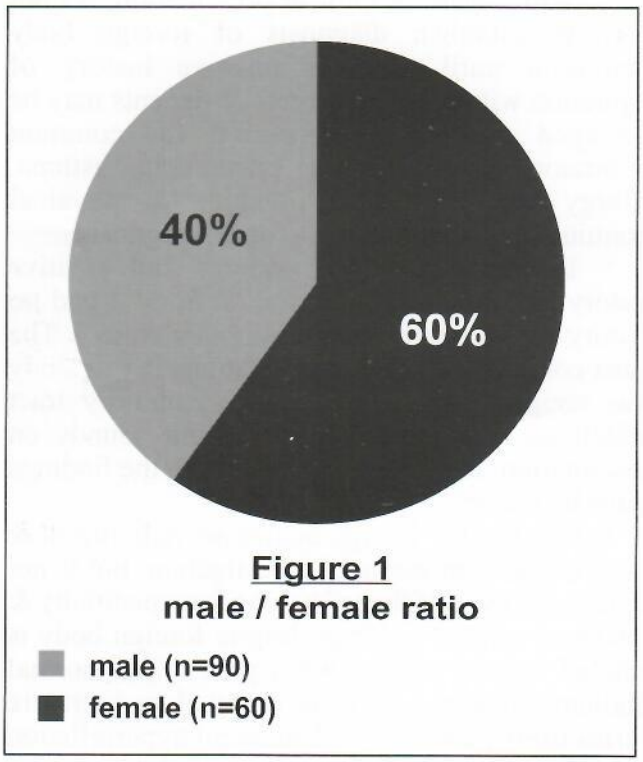


Figure 1
male / female ratio

TABLE-01
Clinical Presentation

Symptoms / Signs	No. of cases	%
Cough	80	53.33%
Dyspnea	80	53.33%
Recurrent RTI	66	44%
Positive history of foreign body	54	36%
Choking	48	32%
Diminished/absent breath sounds	95	63.33%
Cyanosis	4	2.66%
Subcutaneous emphysema	3	2%

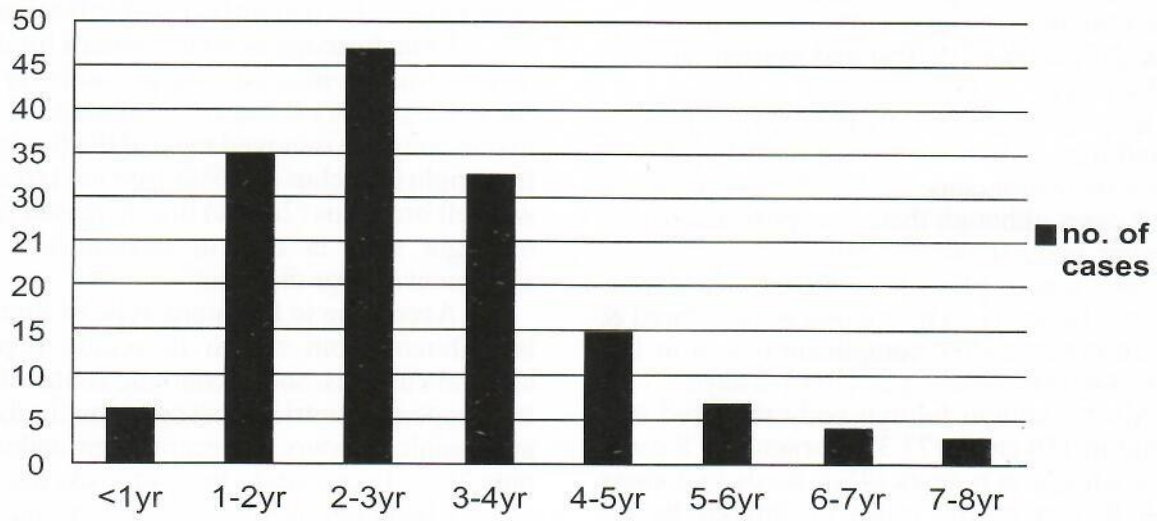


Figure 2 Age of presentation

TABLE-02
X-Ray findings

Findings	No. of Patients
Unilateral hyperinflation	70
Bilateral hyperinflation	30
Collapse	15
Visible foreign body	6
Normal	29

TABLE-03
Bronchoscopic findings

Site	No. of Patients	%
Right main bronchus	70	46.66
Left main bronchus	40	26.66
Trachea	15	10
Bilateral bronchus	11	7.3
Vocal cords	4	2.66
No foreign body	10	6.6%

TABLE-04
Types of foreign body aspirated

Site	No. of Patients	%
Betel nut	110	73.3%
Peanut	8	5.3%
Whistle	6	4%
Seeds	7	4.6%
Paper pins	2	1.33%
Plastic tubes	2	1.33%
Nail	1	0.6%
Headscarf pin	1	0.6%
Pearl	1	0.6%
spring	1	0.6%
Meat piece	1	0.6%
No foreign body	10	6.66%

Figure: 3
Unilateral hyperinflation & right upper segmental collapse lung

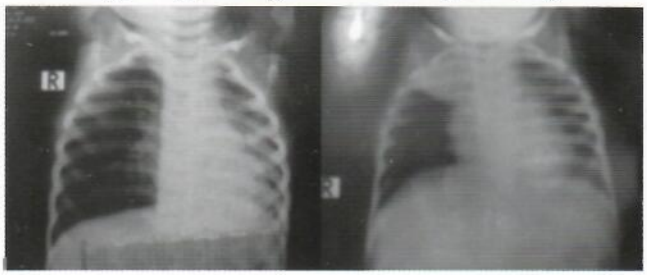
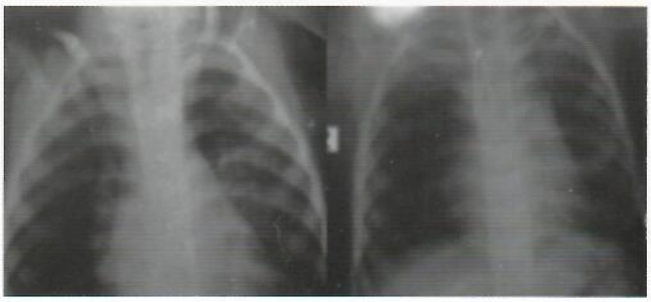


Figure: 4
Visible foreign bodies on X-Rays



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