Publisher
MEDRESEARCH
www.medresearch.in

International Journal of Medical Research and Review

2019 Volume 7 Number 4 July-August

E-ISSN:2320-8686
P-ISSN:2321-127X

Research Article
Aerodigestive

Incidence and management of foreign bodies in aerodigestive tract in a tertiary level

Bajaj N.[1*], Kanoriya D.[2]

DOI: https://doi.org/10.17511/ijmrr.2019.i04.07

[1*] Neetu Bajaj, Assistant Professor, Department of E.N.T., Bundelkhand Medical College and Hospital, Sagar, Madhya Pradesh, India.

[2] Dharmendra Kanoriya, M.D.S., Department of Dentistry, District Hospital, Sagar, Madhya Pradesh, India.

Introduction: Foreign body (FB) ingestion and aspiration is a life-threatening condition which is quite common in children. It is important to diagnose foreign body aspiration early as delay in its recognition and treatment results in high morbidity and mortality. The objective of the present prospective study was to study foreign bodies in aerodigestive tract on the basis of history, examination, and investigation, their incidence, type of foreign body, site of lodgment, common symptoms with which presented, and the nature of the problem in dealing with these patients during the management. **Materials and Methods:** A total of 86 cases of FB in aerodigestive tract admitted in ENT ward of Bundelkhand Medical and Hospital were included in the study. The symptoms, site and radiographic findings were recorded for each patient. Various procedures were used for removal of various FB at different locations. Majority of these procedures were performed under anesthesia. **Results:** Of all admitted foreign body cases (86 cases), incidence was more for males (63 cases) than for females (23 cases). Likewise, it was encountered more commonly in the age group of 1-10 years. FB were removed smoothly and successfully in all cases. Overall outcome was excellentwith minimum morbidity and no mortality. According to the site of involvement, hospital stay was varied. **Conclusion:** In this study, it is evident that FB in aerodigestive tract is a common clinical problem in otorhinolaryngological practice. Although, some presents with serious and life-threatening emergencieswhilemany does not have an immediate problem of airway. Higher incidence of foreign body in children can be prevented by educating the parents about keeping the articleaway from reach of children and observing the activity of the child.

Keywords: Foreign body, Aerodigestive tract, Endoscopy, Oesophagoscopy, Bronchoscopy

Corresponding Author

Neetu Bajaj, Assistant Professor, Department of E.N.T., Bundelkhand Medical College and Hospital, Sagar, Madhya Pradesh, India.
Email: neetubajaj46@gmail.com

How to Cite this Article

Bajaj N, Kanoriya D. Incidence and management of foreign bodies in aerodigestive tract in a tertiary level. Int J Med Res Rev. 2019;7(4):293-299.
Available From
https://ijmrr.medresearch.in/index.php/ijmrr/article/view/1072

To Browse

Manuscript Received	Review Round 1	Review Round 2	Review Round 3	Accepted
2019-06-28	2019-07-07	2019-07-14		2019-07-19

Conflict of Interest	Funding	Ethical Approval	Plagiarism X-checker	Note
No	Nil	Yes	7%	

OPEN ACCESS

© 2019 by Neetu Bajaj, Dharmendra Kanoriya and Published by Siddharth Health Research and Social Welfare Society. This is an Open Access article licensed under a Creative Commons Attribution 4.0 International License https://creativecommons.org/licenses/by/4.0/ unported [CC BY 4.0].

Introduction

Foreign bodies (FB) in the aerodigestive tract pose a significant challenge to the otolaryngologist. Otolaryngology emergent services are frequently encountered by FB aspiration and ingestion. It sincidence is more common in children or in elderly age group, therefore pose a significant challenge to ENT surgeon for its management [1]. FB ingestion is accidental but occasionally, it can be homicidal or suicidal [2]. Coins are the most common FB in children, but other things such as marbles, button, batteries, safety pins, and bottle tops are also reported.

Bones, dentures, and metallic wire are most common FB in adults [3]. Adults account for only about 20% of the reported cases of aspirations [4]. Altered mental status, trauma with a decreased level of consciousness, and impaired airway reflexes, when airway protective mechanisms function inadequately or facial traumas are the leading causes associated with FB aspiration [5].

It is difficult to eradicate the problem due to curious and exploratory nature of children. A comprehensive approach is important for early recognition and timely management of aspirated and ingested foreign bodies, as complications from delayed diagnosis can have significant health implications. Serious complications from aspirated foreign bodies such as severe airway obstruction and death, tend to occur in infants and younger children due to the small size of their airways [6]. Early diagnosis is essential in FB aspiration, as delay in its recognition and treatment results inunnecessary distress to patients and may even lead to potentially life threatening complications.

Standard approach for removal of FB in both the airway and the oesophagus is peroral rigid endoscopy. However, flexible endoscopies are commonly performed nowadays, especially by pediatricians and pneumologists [7].

A number of studies have been done previously on the various clinical aspects of FB in aerodigestive tract, including FB types, its aetiology, presenting symptoms, the relevant investigations and methods of their removal.

There have also been studies on ways of improving the management outcomes [8-11]. In the present study, we studied prospectively the pattern of presentation of patients in a single institution with FB inaerodigestive tract and incidence of intra-operative complications following rigid esophagoscopy/ bronchoscopy and the incidence of successful outcome after this procedure.

Material and Methods

Study design, duration and type of study: A total of 86 patients who came or referred to the ENT Ward of Bundelkhand Medical college and associated Hospital, Sagar, Madhya Pradesh between November 2017 to May 2019 with history of suspicion of a FB in the aerodigestive tract (except nasal FB) were included in the presentprospective study.

Data collection, analysis andinclusion criteria: The sources of referral included direct referrals from casualty officers, general practitioners and also transfer from other nearby hospitals.All the cases were admitted and studied in detail for demographic information, incidence,type of body, site of lodgment, and common symptoms with which they presented and the nature of the complication in dealing with these patients during the managements.

Exclusion criteria: Examples of conditions warranting exclusion were patients with cleft lip and palate, diffuse esophageal spasm and tracheo-esophageal fistula, esophageal strictures, those who had recently had bowel surgery and children with mental retardation or neurological abnormalities.

Ethical consideration: Ethical approval was obtained from the Institutional Ethical Committee of the medical college.Parents or guardians provided a written consent to include patients in the study.

Surgical procedure: Radiological evaluationwas performed appropriately including chest and neck x-ray was done. All endoscopies were performed under general anaesthesia.

Rigid laryngoscope with fiberoptic light carrier was used for laryngeal and hypopharyngeal FB removal while rigid esophagoscope with distal illumination was used for oesophageal FB removal.

Antibiotic was administrated intravenously and nasogastric feeding tube was put when there where oesophageal mucosa erosion or perforation. Immediate postoperative period included surveillance during 24 hours. After each procedure, a chest x-ray was taken.

Statistical analysis: The statistical analysis was performed using SPSS/PC software version 10.0

(SPSS Inc. USA). The analysis was descriptive. It aimed to illustrate and explain the purpose of the discussion.

Results

Totalnumbers of patients studied were 86. Out of this, 63 were male and 23 were female. The incidence was common in male. In the present study, incidence of aerodigestive foreign body was highly among the age group of 1-10 year.

The youngest patient was 5 monthsold, while the oldest was 62 years. In the majority of children,the FB ingestion or aspiration was witnessed or strongly suspected by a bystander after sudden onset of symptoms. On clinical examination, FB was visible in 60% cases. Radio-opaque FB was visible in chest and neck x-ray.

In the present study, it was found that children younger than 5 years usually came to the hospital immediately, but children older than 5 years usually came 4-5 days after foreign body ingestion. They wait for spontaneous removal of foreign body.12% children showed FB in lower digestive tract in x-ray in these cases.

Table-1: Age incidence of study population

Age	Number
0-10	62
11-20	09
21-30	02
31-40	06
41-50	04
51-60	02
61-70	01
Total	86

Table-2: Incidence of various foreign bodies.

Type	Number
Coin	69
Fish bone	04
Chicken bone	03
Toy parts	03
Batteries	02
Artificial denture	02
Food	01
Miscellaneous	02

One child brought dead suspected of FB in air passage. One children reported 4-5 days after toy battery ingestion.In the middle third of the oesophagus, mucosal erosion was present.

Without any postoperative complication, battery was removed successfully. Patient was kept on Ryle's tube feeding, i.v. antibiotics and discharged without any complication. Cricopharynx was the commonest site of FB in children followed by middle third of the oesophagus. One 5 months old baby came with ingestion of very large turban decorative pin. On examination,it was found in the nasopharynx and oropharynx. Its sharp point had pierced the mucosa which was removed successfully and patient was discharged after 2 days of hospitalization.

Adult patients usually reported with FB like fish bone, piece of food, husk, and chicken bone. Acute difficulty in breathing was found in adult patient with history of accidental inhalation of husk. Soft palate, uvula was edematousonclinical examination. Pus point seen in left anterior pillar. FB could notbe found out as tried to find.Pus point dilated and drainage of pus was done. Patient got relief in 2 days.

Rigid esophagoscopyunder general anesthesia was done for digestive tract foreign body. 3 patients came 10-15 days after fish bone ingestion. It was very difficult to find out FB in those cases, but after necessary investigation, no signs of FB seen. One patient came with some unknown FB in throat with severe pain. On rigid endoscopy, ant was found on aryepiglottic fold, which was removed successfully under local anesthesia.

Discussion

Anemerging problem in both children and adults is the FB in the aerodigestive tract. Impacted FB of the digestive tract are held up in cricopharynxin 80% of cases as reported in literature previously which is similar to the finding of the present study [12]. Potentially dangerous and life-threatening object should be prevented from putting in the mouth. For each patient,a radiological investigation is necessary suspected of having an aerodigestive FB especially in children where bystander is the main witness of these accident [13,14].

Diagnosis is easy in the absence of symptoms with radio-opaque FB, where radiolucent FBrepresent a much more difficultdiagnostic challenge. A negative radiological investigation does not rule out the presence of a FB in aerodigestive tract and does not spare from endoscopy when the ingestion or the aspiration is strongly suspected [15]. ENT physicians face a real challenge for quick atraumatic removal of foreign bodies.

FB in ENT cavities for over 72 hours and repeated attempts to remove them increases the complications, both iatrogenic and in addition to reducing the chances of success considerably [16].

The male to female ratio in the present study is 3:1 which is similar to previous other studies [17-19]. The reason for male predominance remains unclear; however, more adventurous and impulsive nature of young boys may be the reason for their predominance [20]. Coins and toy parts are almost found in youngerchildrenmore than 5 years, whereas bones are found exclusively in patients of other age groups [21].

Banerjee et al. [22] and Rothman et al [23] reported the highest incidences of foreign body aspiration and ingestion in children below three years. Since these children lack molar teeth, edibles placed in the mouth are usually broken up but not chewed which they easily ingest aspirate, especially if the child is running, playing, or talking. The natural propensity of attempting to gain knowledge by putting things into mouth and the tendency of parents to thump or spank the children for acts of naughtiness at feeding time were also contributory factors.

This age group may also be involved due to immature co- ordination in the swallowing mechanism. In the study of Steven C [24], the average age of patients with foreign body aero-digestive tract was 3 years.According to the site, coins, foods and sharp objects are the most common FB lodged in the oesophagus [25–28], vegetables (especially peanuts and seeds) in the airway [13, 26] and bones in the pharynx [29].

The present study showed the similar results.In the study of Steven C [24], 47 Coins, 23 sharp objects, 4 Button batteries and 65 blunt and non-corrosives were found. Khan MA [30] also found that coin was the most common foreign body in aerodigestive tract. In the Arab world, watermelon seeds were the commonest aspirated foreign body. This difference is due to the eating habits of people in different countries.

In thepresent study, most of the foreign bodies were removed on the same day. Under general anesthesia, rigid endoscopy with forceps removal is preferred method of removing these foreign bodies [31-36]. Most reliable method for removal through the rigid endoscope still has its place.

Extremely rare serious complications are caused by rigid endoscopy [37] (1% in the present study) and these include iatrogenic oesophageal perforation, perioesophageal abscess or mediastinitis. These complications can be controlled by antibiotics and if necessary, incision with drainage may be required.

Current mortality rates are less than 1% in most reports [25, 38,39]. Nwaorgu OG [40] performed 22 cases of oesophagoscopies for dentures removal, 17 cases were successfully removed and failed in 3 cases. Complications were seen in 5 patients (pulmonary oedema and oesophageal perforation).

Other techniques for removal of oesophageal FB include Foley balloon extraction, using a magnet and bougienage for removal [28,41]. They can be used only in selected cases with smooth FB [41]. For diagnosis and management of tracheobronchial FB, endoscope is also an excellent tool. Preventive measures with public education is important for this serious problem.

The limitation of the present study is smaller sample size. Further longitudinal multicentred clinical studies with larger sample sizes must be carried with clinical and radiological analysis to confirm the results of this study.

Conclusion

The present study confirms that the foreign bodies in aerodigestive tract are a common clinical problem in otorhinolaryngological practice. Though, some of them does not have an immediate problem of airway while presents with serious and lifethreatening emergencies.

Education of parents about keeping the article away from reach of children is important and observing child’s activity will prevent the higher incidence of a foreign body in children.

What this study adds to existing knowledge?

Many studies reported the incidence of foreign body in aerodigestive tract but very few studies have been done in the Madhya Pradesh region. So, the present study shows the incidence, distribution and types of FB in aerodigestive tract in the Bundelkhand region of Madhya Pradesh.

Authors' Contributions

Dr. Neetu Bajaj: Conceived this work, performed all the procedures, collected and analyzed data and reviewed the manuscript have given final approval of the version to be published.

Dr. Dharmendra Kanoriya: Performed literature search, collected and analyzed data and prepared the manuscript.

Conflict of interest and funding: Authors declares that they have no conflict of interest. Authors declare no financial support or relationships that may pose conflict of interest.

Reference

01. Esclamado RM, Richardson MA. Laryngotracheal foreign bodies in children- A comparison with bronchial foreign bodies. Am J Dis Child. 1987;141(3)259-62.
DOI: 10.1001/archpedi.1987.04460030037019 [Crossref]

02. Hilliard T, Sim R, Saunders M, Hewer SL, Henderson J. Delayed diagnosis of foreign body aspiration in children. Emerg Med J. 2003;20(1)100-1.
DOI: 10.1136/emj.20.1.100 [Crossref]

03. Cohen SR, Herbert WI, Lewis GB Jr, Geller KA. Foreign bodies in the airway, Five-year retrospective study with special reference to management. Ann Otol Rhinol Laryngol. 1980;89(5 Pt 1)437-42.
DOI: 10.1177/000348948008900513 [Crossref]

04. Al-Sarraf N, Jamal-Eddine H, Khaja F, Ayed AK. Headscarf pin tracheobronchial aspiration- a distinct clinical entity. Interact Cardiovascul Thor Surg. 2009;9(2)187–190.
DOI: 10.1510/icvts.2009.207548 [Crossref]

05. Boyd M, Chatterjee A, Chiles C, Chin R Jr. Tracheobronchial foreign body aspiration in adults. South Med J. 2009;102(2)171-4.
DOI: 10.1097/SMJ.0b013 e318193c9c8 [Crossref]

06. Gupta P, Jain AK. Foreign bodies in upper aero-digestive tract- a clinical study. Int J Res Med Sci. 2014;2(3)886-91.
DOI: 10.5455/2320-6012.ijrms 20140823 [Crossref]

07. Kpémissi E, DiparidéAgbèrè AR, Ndakéna K, Késsié K. Foreign bodies of the esophagus: etiologic and therapeutic aspects. Experience at the CHU of Lomé (Togo). Sante.
1997;7(5)338-40 [Crossref]

08. Gautam V, Phillips J, Bowmer H, Reichl M. Foreign body in the throat. J Accid Emerg Med. 1994;11(2)113-5.
DOI: 10.1136/emj.11.2.113 [Crossref]

09. Diop EM, Tall A, Diouf R, Ndiaye IC. Laryngeal foreign bodies- management in children in Senegal. Arch Pediatr. 2000;7(1)10-5.
DOI: [Article] [Crossref]

10. Devaraja K, Nayak DR, Bhandarkar AM, Sharma PV. Usual suspects- the foreign bodies of the aerodigestive tract. BMJ Case Rep. 2018;224979.
DOI: 10.1136/bcr-2018-224979 [Crossref]

11. Bekele A. Aerodigestive foreign bodies in adult ethiopian patients- a prospective study at tikuranbessa hospital, ethiopia. Int J Otolaryngol. 2014;293603.
DOI: 10.1155/2014/293603 [Crossref]

12. Han S, Kayhan B, Dural K, Kocer B, Sakinci U. A new and safe technique for removing cervical esophageal foreign body. Turk J Gastroenterol. 2009;16;108-110.
[Crossref]

13. Fennira H, Ben Slimene D, Bourguiba M, Mahouachi R, Drira I, Chtourou A, et al. Tracheobronchial foreign bodies. Diagnostic and therapeutic aspects in children. Tunis Med.
2004;82(9)817-26 [Crossref]

14. Donato L, Weiss L, Bing J, Schwarz E. Tracheobronchial foreign bodies. Arch Pediatr. 2000;7 (1)56S-61S.
DOI: 10.1016/ S0929-693X(00)88821-1 [Crossref]

15. Messner AH. Pitfalls in the diagnosis of aerodigestive tract foreign bodies. Clin Pediatr (Phila). 1998;37(6)359-65.
DOI: 10.1177/000992 2898 03700605 [Crossref]

16. Lam HC, Woo JK, van Hasselt CA. Management of ingested foreign bodies- a retrospective review of 5240 patients. J Laryngol Otol. 2001;115(12)954-7.
DOI: 10.1258/0022215011909756 [Crossref]

17. Bittencourt PF, Camargos PA, Scheinmann P, de Blic J. Foreign body aspiration- clinical, radiological findings and factors associated with its late removal. Int J Pediatr Otorhinolaryngol. 2006;70(5)879-84.
DOI: 10.1016/j.ijporl.2005.09.024 [Crossref]

18. Roda J, Nobre S, Pires J, Estêvão MH, Félix M. Foreign bodies in the airway- a quarter of a century's experience. Rev Port Pneumol. 2008;14(6)787-802.
[Crossref]

19. Mantel K, Butenandt I. Tracheobronchial foreign body aspiration in childhood- A report on 224 cases. Eur J Pediatr. 1986;145(3)211-6.
[Crossref]

20. Chiu CY, Wong 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.
DOI: 10.1097/01.pec.0000161470.19841.50 [Crossref]

21. Hughes CA, Baroody FM, Marsh BR. Pediatric tracheobronchial foreign bodies- historical review from the Johns Hopkins Hospital. Ann Otol Rhinol Laryngol. 1996;105(7)555-61.
DOI: 10.1177/000348949610500712 [Crossref]

22. Banerjee A, Rao KS, Khanna SK, Narayanan PS, Gupta BK, Sekar JC, et al. Laryngo-tracheobronchial foreign bodies in children. J Laryngol Otol. 1988;102;1029-32.
[Crossref]

23. 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 [Crossref]

24. Stevens C, Ardagh M, Abbott GD. Aerodigestive tract foreign bodies in children- one year's experience at Christchurch Hospital emergency department. N Z Med J. 1996;109(1024)232-3.
[Crossref]

25. Arana A, Hauser B, Hachimi-Idrissi S, Vandenplas Y. Management of ingested foreign bodies in childhood and review of the literature. Eur J Pediatr. 2001;160(8)468-72.
[Crossref]

26. Ozguner IF, Buyukyavuz BI, Savas C, Yavuz MS, Okutan H. Clinical experience of removing aerodigestive tract foreign bodies with rigid endoscopy in children. Pediatr Emerg Care. 2004; 20;671– 673.
[Crossref]

27. Li ZS, Sun ZX, Zou DW, Xu GM, Wu RP, Liao Z. Endoscopic management of foreign bodies in the upper-GI tract- experience with 1088 cases in China. Gastrointest Endosc. 2006;64(4)485-92.
DOI: 10.1016/j.gie.2006.01.059 [Crossref]

28. Little DC, Shah SR, St Peter SD, Calkins CM, Morrow SE, Murphy JP, et al. Esophageal foreign bodies in the pediatric population- our first 500 cases. J Pediatr Surg. 2006;41(5)914-8.
DOI: 10.1016/j.jpedsurg.2006.01.022 [Crossref]

29. Higo R, Matsumoto Y, Ichimura K, Kaga K. Foreign bodies in the aerodigestive tract in pediatric patients. Auris Nasus Larynx. 2003;30(4)397-401.
DOI: 10.1016/S0385-8146 (03)00087-7 [Crossref]

30. Khan MA, Hameed A, Choudhry AJ. Management of foreign bodies in the esophagus. J Coll Physicians Surg Pak. 2004;14(4)218-20.
DOI: 04.2004/JCPSP. 218220 [Crossref]

31. Uba AF, Sowande AO, Amusa YB, Ogundoyin OO, Chinda JY, Adeyemo AO, et al. Management of oesophageal foreign bodies in children. East Afr Med J. 2002;79(6)334-8.
[Crossref]

32. Díaz GA, Valledor L, Seda F. Foreign bodies from the upper-aerodigestive tract of children in Puerto Rico. BolAsoc Med P R. 2000;92(9-12)124-9.
[Crossref]

33. Asmatullah, Inayatullah, Rasool. Endoscopic removal of tracheobronchial foreign bodies at a peripheral hospital. JPMI. 2004;8;447-452.
[Crossref]

34. Ellen M Friedman. Tracheobronchial foreign bodies. Otolarygol Clin Nor Am. 2000;3;179-85. [Crossref]

35. Cataneo AJ, Reibscheid SM, Ruiz Júnior RL, Ferrari GF. Foreign body in the tracheobronchial tree. Clin Pediatr (Phila). 1997;36(12)701-6. DOI: 10.1177/ 000992289703601206 [Crossref]

36. Lemberg PS, Darrow DH, Holinger LD. Aerodigestive tract foreign bodies in the older child and adolescent. Ann Otol Rhinol Laryngol. 1996;105(4)267-71. DOI: 10.1177/000348949610500404 [Crossref]

37. Hachimi-Idrissi S, Corne L, Vandenplas Y. Management of ingested foreign bodies in childhood- our experience and review of the literature. Eur J Emerg Med. 1998;5(3)319-23. [Crossref]

38. Hsu WC, Sheen TS, Lin CD, Tan CT, Yeh TH, Lee SY. Clinical experiences of removing foreign bodies in the airway and oesophagus with a rigid endoscope- a series of 3217 cases from 1970 to 1996. Otolaryngol Head Neck Surg. 2009;122(3)450–454. DOI: 10.1067/mhn.2000.98321 [Crossref]

39. Endican S, Garap JP, Dubey SP. Ear, nose and throat foreign bodies in Melanesian children- an analysis of 1037 cases. Int J Pediatr Otorhinolaryngol. 2006;70(9)1539-45. DOI: 10.1016/j.ijporl.2006.03.018 [Crossref]

40. Nwaorgu OG, Onakoya PA, Sogebi OA, Kokong DD, Dosumu OO. Esophageal impacted dent ures. J Natl Med Assoc. 2004;96(10)1350-3. [Crossref]

41. Athanassiadi K, Gerazounis M, Metaxas E, Kalantzi N. Management of esophageal foreign bodies- a retrospective review of 400 cases. Eur J Cardiothorac Surg. 2002;21(4)653-6. DOI: 10.1016/s1010-7940(02)00032-5 [Crossref]