



FOREIGN BODIES IN AERODIGESTIVE TRACT: A CLINICAL REVIEW OF 109 PATIENTS.

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ABSTRACT

Aim : To study profile of patients of Foreign bodies (F.B.) in aerodigestive tract with respect to variables like nature of (F.B.), site of impaction, mode of removal and complications arising there from. **Study design:** Patients with F.B. in food and air passage were studied prospectively from Jan 2004 to April 2020. Work up included elaborate history, clinical examination and radiological search for F.B. Employing various procedures like direct laryngoscopy, Oesophagoscope, hypopharyngoscopy and bronchoscopy. F.B. were retrieved. Data of 109 patients thus collected was analyzed. **Results:** Of the 82 (75.22%) patients of foreign body in food passage, 55(67.07%) were males and 27(32.92%) were females. Cricopharynx was the commonest site in 43(53.08%) patients while coin 28(34.56%) was the commonest type of foreign body. Regarding F.B in air passage youngest patient was 7 months old. 21(77.77%) were males and 6(22.22%) were females. Seed 13(48.14%) was the commonest type of Foreign bodies in air passage.

KEYWORDS

Foreign Bodies, Aerodigestive Tract.

Introduction:

A foreign body (F.B) in aerodigestive tract is a common concern shared by E.N.T surgeons. While F.B. in air passage are commonly seen in younger children, F. B. in food passage are encountered in children and adults alike. Both sites have a common feature of increased morbidity and mortality. But F. B in tracheobronchial region poses additional diagnostic problem which gets further compounded in radiolucent F.B. Testing diagnostic acumen and endoscopic skills apart, delayed diagnosis is a lurking danger when patient's parents underestimate symptoms and general physician glosses over clinical and radiological findings.

We decided to look on the F.B in aerodigestive tract coming to AVBRH Sawangi, wardha (Maharashtra) addressing demographic attributes like age, sex and specific dimensions like duration of lodgment, site, nature of foreign body, mode of removal and complications.

Materials and methods:

Attempt is made critically look at the foreign bodies which either ingested of inhaled. Thus 109 patients coming to AVBRH Sawangi, wardha from Jan 2004 to April 2020 were accrued to present study and analyzed. Patients were subjected to detailed history and clinical examination. In order to confirm the presence of foreign body, its nature and site, radiological investigations and endoscopic assessments was done. Xray chest AP and Lateral view were done in all patients of foreign bodies in food and air passages. Not in all but in selected patients CT scan was done. Suspected radiolucent FBs in esophagus were confirmed by giving thin barium.

Faucial (oropharyngeal) FB were removed as office procedures while depending on site of FB, we resorted to various procedures like Direct laryngoscopy, Oesophagoscope, hypopharyngoscopy and bronchoscopy for retrieval of F.B. Patients were observed for 24 hrs. postoperatively for any complications.

RESULTS:

A total of 109 patients were studied. F.B. in food passages in 82 patients (75.22 %) and F.B in air passages in 27 patients (24.77%) were found with ratio of FB in food and air passage of 3:1. 75 patients (68.80%) were male and 34 (31.20%) were female with male to female ratio of 2.2:1 (Table 1).

a. Age and Sex:

Out of total 109 patients ,82(75.22 %) had F.B in food passages. Youngest patient was 8 months old while oldest was of 65 years old with the mean age of 24.86 years. 23 foreign bodies (28.08%) were in

the age group of 0-5 years while 14 (17.07%) and 4 (4.87%) were in the age group of 5-10 years and 10-20 years of age respectively. Notably almost a third of patients (25 ,30.48 %) were above 40 years of age. (Table 1). 55 patients (67.07%) of FB in food passage were male and 27(23.92) were female. (Table 1)

Regarding FB in air way youngest patient with FB in airway was 7 months old while oldest was of 60 years old with mean age of 9.32 years.

Age wise distribution of 27 patients with FB in airway is given in Table 1. Most of the patients were in the age group of 0-5 years (16, 59.25%) followed by age group of 5-10 years (6,22.22%) Only 2 patients (7.40%) were in their 2nd decade and 4th decade each. 21 (77.77%) were male and 6 (22.22%) were female.

Table 1. Age wise distribution of patients

Age group	Food passage			Airway			Total
	Male	Female	Number	Male	Female	Number	
0-5	18	6	24(29.26%)	14	2	16(59.25%)	40
5-10	11	3	14(17.03%)	3	3	6(22.22%)	20
10-20	1	3	4(4.87%)	2	1	2(7.4%)	6
20-40	7	8	15(18.29%)	1	0	1(3.7%)	16
>40	18	7	25(30.48%)	2	0	2(7.4%)	27
							109

b. Duration of Lodgment:

In Food passage in 72 (87.80%) patients, duration of lodgment was less than 24 hours while duration of 1-3 days and more than 3 days was observed in 8 (9.75%) and 2 patients (2.43%) respectively. While in air passage, in 4 patients (14.81%) each, duration was less than 24 hours and 1-3 days. while in 17 (62.96%) it was more than 3 days. Duration was unknown in 2 patients (7.40%)

Table 2. Duration Of Lodgment Of Foreign Body.

Duration	Food passage (number of patients)	Air passage (number of patients)
0-1 days	72(86.58%)	4(14.81%)
1-3 days	8(9.75%)	4(14.81%)
>3 days	2(2.43%)	17(62.96%)

C. Site of Foreign bodies:

Site wise distribution of patients with FB in food passage is given Table 3 and 4. Cricopharynx (44, 53.65%), upper, middle and lower esophagus (16,19.49%), base of tongue (4,4.87%) and pyriform fossa

(3, 3.65%) were the sites of FB according to the predilection. Foreign body in tonsillar region were seen in 15 (18.29%) patients. Dysphagia and foreign body sensation were the principal symptoms.

In air passage Foreign bodies in Right Bronchus was observed in 14 patients (51.85%) and in left bronchus in 7 patients (25.92%). Trachea and larynx as a site of FB was observed in 3 (11.11%) and 2 patients (7.40%) respectively.

Cough and chronic LRTI were the principal symptoms.

Table 3. Site Wise Distribution Of Patients With Foreign Body In Food Passage.

Site	No of patients
Base of tongue	4(4.87%)
Tonsil	15(18.29%)
Pyriiform fossa	3(3.65%)
Cricopharynx	44(53.65%)
Upper esophagus	7(8.53%)
Mid esophagus	8(9.75%)
Lower	1(1.21%)

Table 4. Site Wise Distribution Of Patients With Foreign Body In Air Passage.

Site	No of patients
Right bronchus	14(51.85%)
Left bronchus	7(25.92%)
Trachea	3(11.11%)
Glottis	2(7.40%)

d. Nature of FB

In food passage, Coin in 28 patients (34.14%) was the commonest type of FB encountered followed fish bone in 13 patients (15.85%) chicken bone in 7 patients (8.64%) and denture in 2 patients (2.43%) (figure 1). Other FB observed were stapler pin, food bolus, betel nut (figure 2), spring metal (figure 3), mango core, fine stick, thorn, metal plate etc.

Most of the F.B. were radiopaque posing little difficulty in diagnosing them. In 7 patients (8.53%) FB were radiolucent and confirmed by seeking either barium swallow or CT scan.

In airway, Seed in 13 patients (48.18%) was the most frequently encountered foreign body followed by betelnut in 6 (22%). Food bolus, peanut, whistle were the other types of F.B.

e. Mode of removal: In FB of food passage, removal of foreign body as an OPD procedure was done in local anesthesia in 16(19.51%) patients. Rest of the patients needed general anesthesia for removal by hypopharyngoscopy (43 patients, 52.43%), Rigid esophagoscopy (22 patients, 26.82%), flexible esophagoscopy (1 patient, 1.21%).

In Airway, removal by Bronchoscopy under general anesthesia was done in 26 patients (96.29%) and DLscopy in 1 patient (2.86%). CT scan for diagnosis was employed in 7 (25%) patients. (Fig 5)

f. Complications:

Fortunately, we met with no complications postoperatively in foreign body in food passage while one elderly patient of airway F.B., dislodgement of FB from right to left bronchus which resulted in stridor, was observed. The dislodged foreign body was removed by bronchoscopy in emergency.

g. Salient features:

In F.B in food passage 8 months old female child presenting with stridor, multiple coins stacked one over the other observed in 2 patients in cricopharynx, battery cell (figure 4) in mid esophagus after removal developed tracheoesophageal fistula postoperatively (which healed later on) were some of the salient features.

Figures :-

Figure 1.
Denture



Figure 2.
Betelnut



Figure 3.
Spring

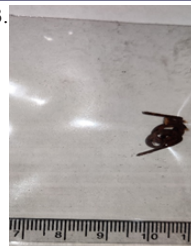


Figure 4.
Battery

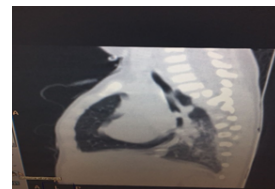
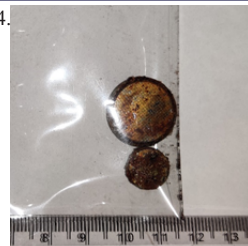


Figure 5. CT scan showing F.B.in right main bronchus



Figure 6. Xray showing foreign body in mid. oesophagus

Discussion:

Foreign body (FB, from the Latin *corpus alienum*) refers to any object that was originated outside the body. Most of the references to FB involve their entrance through natural orifices into hollow organs, thus one of the most common locations for a FB is the digestive tract¹⁰. It was the revolutionary work of Chevalier Jackson & Chevalier L Jackson in 1949 through 1957 that bronchoesophagoscopy got its individuality as a medical science. Regarding F.B In airway and bronchus the endoscope was first utilized in 1897 as before bronchotomy was resorted for removal of F.B. Management of such patients was revolutionized by Jackson in 1904. The basic principle in the evaluation and management developed by them has cut down the mortality from more than 20% to 2%¹.

Foreign Bodies in food passage (n=82)

In this study of F.B in aerodigestive tract 109 patients were studied from November 2004 to March 2020. Out of these 82 (75.22%) were in food passages while FB in air passage were found in 27 (24.77%) patients. In the study, Hung W and Lin P (2) found 76% and 24.7% F.B in food passages and airway respectively. In other large study 86.2% of F.B. were in pharyngoesophageal region (food passages), while 13.7% in tracheobronchial region (air passage)¹. Our findings are in agreement with above studies. Almost a third of our patients 33(30.27%) were female.

Age range of 8 months to 65 years for FB in food passage was noted in our study. However, F. B with much smaller age have also been reported in literature.⁴

We found most of our cases in extremes of age group i.e. 0-5 years (28.39%) and more than 40 years (30.86%) 4.87% in 10-20 years were observed (Table 1). It has been observed^{5,6,7} that esophageal F.B are common especially in children. Most are ingested by children younger than 5 years with peak incidence between 6 months to 3 years as a sequel of natural proclivity to put things in their mouth.

Of 82 the patients of F.B in food passages 43 patients (53.08%) were found in cricopharynx. Cricopharynx as a commonest destination for food passage FB is well known due to poor peristalsis, sphincteric action and narrow diameter. In one of the large series¹, 50.5% FB in food passages were in cricopharynx, thus supporting conventional wisdom and also our observation. In yet another study⁸, majority of the foreign bodies (83.5%) were located at cricopharynx.

We observed coin (28, 34.56%) followed by chicken bone (7, 8.64%) to be the commonest type of F.B. in food passages. In a study⁸ where 152 cases (104 children and 48 adults) were studied, 91 foreign bodies (69%) were coins thus lending credence to our observation. However kamat et al¹ found fish bone as a commonest F.B. Geographical factors in the study (coastal area) may account for this divergence in findings.

Most of our patients with FB in food passage (78, 95.12%) had radiological evidence of F.B. In radiolucent FB, thin barium was given and diagnosis was made. Kamat et al¹ observed that 81.2% had either direct or indirect evidence of F.B.

Thankfully none of our patients developed complications but in one (1.21%) of 82 patients due to stricture, flexible oesophagoscope was resorted and partly F.B was removed and partly pushed into the stomach.

An OPD procedure was done in local anesthesia in 16 (19.51%) patients. Rest of the patients needed general anesthesia for removal by hypopharyngoscopy (43 patients 52.43%), Rigid esophagoscopy (22 patients 26.82%), flexible esophagoscopy (1 patient, 1.21%).

Foreign bodies in air passages (n=27)

Youngest patient was 7 months old while oldest was 65 years. In 14 (51.85%) patient F.B was found to be in right bronchus whereas in 7 (25.92%) patient F.B was found in left bronchus. In one of the study (9) where 42 patients were studied, 25 F.B were in right main bronchus and 17 in left main bronchus, thus supporting the traditional observation that right bronchus being larger and straighter, attract F.B more frequently.

In our study, 13 (48.14%) patients, foreign body was seed followed by betelnut in 6 (22.22%) patients. Bhalodiya et al⁹ found vegetable F.B. mostly seed (ground nut) in 38 out of 42 patients (90.47%).

A definitive or suspicious history of F.B inhalation should be the most important factor in deciding for bronchoscopy in these patients. Performing an X-ray chest in such patients at the time of presentation has only a limited value in diagnosis and should never influence the decision for timely bronchoscopy. In this series of 27 patients we performed CT in 13 (48.14%) patient thus posing little problem in diagnosis. However, in 12 (44.44%) patients only x ray was done and FB being radiolucent in 7 patients normal X-ray in 8 patients none showed direct evidence of FB. X ray was not sought in 2 (3.50%) patients. Changes which were observed were Hyperinflated lung right side upper/middle lobe, Ill-defined hyperdensity in right main bronchus with collapse and patchy consolidation on right lower lobe segment. It is pertinent to mention that Bhalodiya et al.⁹ found normal Xray findings in 32 out of 42 patients. They also observe that time elapsed since inhalation was significantly related to normalcy of Chest Xray findings. With the advent of CT scan and its wide availability, however x ray has lost its diagnostic and decisive value.

Regarding FB in food passage, x ray was done in 54 (65.85%) patients while CT scan was needed in 7 (8.53%) patients. In 4 (4.87%) patients FB being radiolucent thin barium was given with wisp of cotton to diagnose FB. 14 (17.07%) patients there was no need of any radiological investigation as F.B was removed as OPD procedure.

Summary:

1. 82 (75.22%) patients had F.B In food passage and 27 (24.77%) had FB in airway.
2. Cricopharynx (53.08%) was the commonest site for FB in food passage while right bronchus (51.85%) was commonest site for FB in airway.
3. The commonest type of F.B in food passage was coin in 28 patients (34.56%).
4. In two patients stacked multiple coins (three) were removed. Commonest type of F.B encountered in air passage was seed (13, 48.14%)

5. No procedure related complication were observed in any patients in our study. However, one patient with battery in middle esophagus developed trachea esophageal fistula which healed after three weeks
6. In one elderly patient with old impacted FB in right bronchus (Betelnut) which could not be removed in postoperative period developed severe stridor. Investigations revealed dislodgement of FB and its entry into left bronchus. Finally, emergency bronchoscopy was done and FB removed.

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