

CHANGING NATURE OF AERODIGESTIVE FOREIGN BODIES IN A TERTIARY CARE CENTRE OF WEST BENGAL

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ABSTRACT

BACKGROUND

Foreign bodies in the aerodigestive tract are a common emergency faced by every ENT surgeon in day to day practice. The aim of the study is to observe the changing trend in the nature of distribution of different foreign bodies impacted in the aerodigestive tract of subjects attending the ENT department of a tertiary care centre over the last two decades.

MATERIALS AND METHODS

This is a retrospective study. The study group consisted of 173 subjects over the period Jan 2015 to Dec 2016, and 140 subjects over the period Jan 1997 to Dec 1998 attending a tertiary care centre with history of foreign body ingestion or inhalation. The foreign bodies were removed after thorough history taking and necessary investigations. The nature of different foreign bodies in 2015-16 was compared with that of 1997-1998.

RESULTS

The study showed a higher percentage of inorganic foreign bodies and artificial dentures in 2015-16 than the year 1997-1998. The published literature about different types of foreign bodies in aerodigestive tract has been reviewed.

CONCLUSION

Inorganic foreign bodies and artificial dentures are more common foreign bodies in the aerodigestive tract in recent times, i.e. 2015-16 than 1997-1998, mostly due to increasing socioeconomic status.

KEYWORDS

Foreign body, Airway tract, Oesophagus.

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BACKGROUND

Foreign bodies in the aerodigestive tract are very common and have a wide range of presentation ranging from mild discomfort to severe morbidity and sometimes sudden death.¹ It commonly caused by hasty eating, ignorance in children, postural change during eating (artificial dentures), contaminated food. Respiratory distress, dysphagia, choking are the commonest clinical presentation while point tenderness, stridor are the not very uncommon features^{2,3}

Foreign bodies (FB) occur in the aerodigestive tract because of greediness, inattention and haste while eating³. Often individuals quite literally bite off more than they can chew, or fail to give the ingestion process proper attention and time. People with poor vision, artificial dentures, or sensory abnormalities in the oral cavity are more prone to suffer from foreign bodies.³ The fearless nature of the very young, and the impairments that may occur with aging also

responsible for foreign body ingestion and inhalation. Sometimes food products may be contaminated with foreign material which may cause foreign bodies.

MATERIALS AND METHODS

This study was conducted to analyze the various patterns of distribution of foreign body (FB) ingested and inhaled by patients attending ENT outpatient department and emergency of a tertiary care hospital in 2 years i.e. January 2015 to December 2015 & January 2016 to December 2016. The figures were compared with the distribution of similar cases 16 years back i.e. January 1997 to December 1997 & January 1998 to December 1998. A detailed history taken (from mother /father in cases of babies/ children) and clinical examination was done in each patient. In order to confirm and assess the exact location of the foreign body, radiological investigation in the form of X-ray soft tissue neck, and chest (anterior- posterior and lateral view) was done in all cases. In suspected cases of radiolucent foreign bodies, routine rigid oesophagoscopy and bronchoscopy were advocated after Computed Tomography scan and proper consent. Rigid oesophagoscopy was done to remove oesophageal foreign bodies and rigid bronchoscopy was done to remove bronchial foreign bodies. Nasal foreign bodies and oropharyngeal foreign bodies like fish bones were removed as office procedures and excluded from the

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study. Patients were observed postoperatively for 24 hours and discharged. The pattern of the present study (Jan 2015 to Dec 2015, Jan 2016 to Dec 2016) was compared with the trends obtained from ENT department of the same institution of Jan 1997 to Dec 1997 and Jan 1998 to Dec 1998.

Inclusion Criteria

- Foreign body of cricopharynx and oesophagus done under general anaesthesia.
- Foreign body of bronchus was removed under general anaesthesia.

Exclusion Criteria

- Nasal foreign body.
- Oropharyngeal foreign body like fish bone removed as office procedure.

RESULTS

In the present study, 156 subjects with oesophageal foreign bodies were studied (79 during the year 2015 and 77 during the year 2016) and 17 cases of bronchial foreign body studied during the session 2015-16. Total number of patients studied during this session was 173. Among aero digestive foreign bodies oesophageal foreign bodies were about 90.17% during that session.

Among the patients, the youngest subject was a 7-month-old child with coin ingestion while the oldest patient was 69 years old with artificial denture ingestion. Figure 1 summarizes the subject profile of all patients and their age distribution who presented with foreign body ingestion during January 2015 to December 2015. We found that Coins were the commonest foreign body in 25 (31.64%) patient and Inorganic material except coin was the second common ingested material in 24 (30.37%) children and artificial dentures in 15 adults (18.98%).

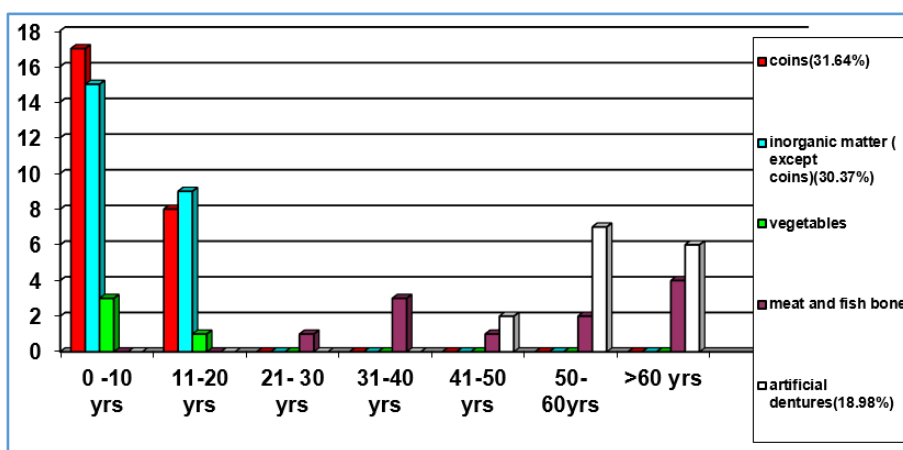


Figure 1. Different Foreign Bodies in Oesophagus and their Age Distribution of 2015 (January-December)

During 2016 (January to December) again Coins were the commonest oesophageal foreign body in 23 subjects (29.87%). Inorganic materials except coin was second most common, ingested by 21 patients (27.27%) and artificial dentures in 16 adults (20.77%) described in Figure 2.

In these 2 years, cricopharynx was the commonest site of impaction in 107(68.58%) patients.

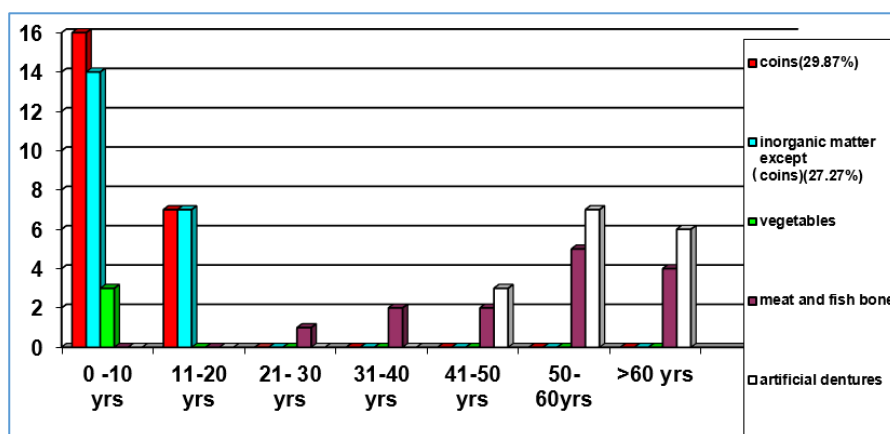


Figure 2. Different Foreign Bodies in Oesophagus and their Age Distribution of 2016 (January-December)

Figure 3 signifies the distribution and trend of FB ingestion in 1997. Coin was the commonest presentation 29 (46.03%) patient out of 63 patients. Inorganic material except coin was in 14 patients (22.22%) and 8 (12.69%) ingested artificial denture.

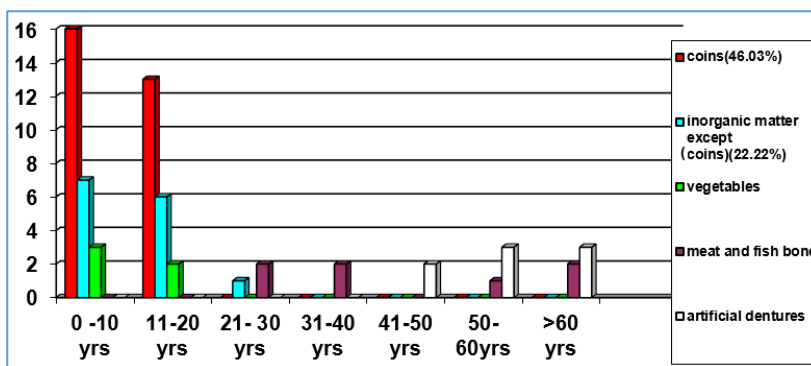


Figure 3. Different Foreign Bodies in Oesophagus and their Age Distribution of 1997(January-December)

While in 1998 (January to December) coins was the commonest as usual in 30 subjects (46.15%) out of 65 patients, inorganic material was in 12 subjects (18.46%) and artificial dentures in 11 adults (16.92%) as shown in figure 4.

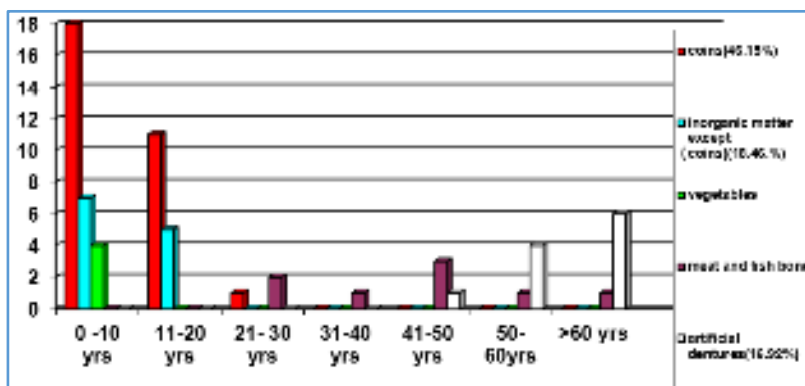


Figure 4. Different Foreign Bodies in Oesophagus and their Age Distribution of 1998 (January-December)

Nature of Foreign Body in Different Year	1997	1998	2015	2016
Coins	29 (46.03%)	30 (46.15%)	25 (31.64%)	23 (29.87%)
Inorganic Material except coin	14 (22.22%)	12 (18.46%)	24 (30.37%)	21 (27.27%)
Vegetables	5 (7.93%)	4 (6.15%)	4 (5.06%)	3 (3.89%)
Meat or fish bone	7 (11.11%)	8 (12.30%)	11 (13.92%)	14 (18.18%)
Artificial denture	8 (12.69%)	11 (16.92%)	15 (18.98%)	16 (20.77%)
Total	63	65	79	77

Table 1. Distribution of Different Foreign Bodies of Oesophagus in Different Years

The distribution of different types of foreign body of among the above-mentioned years are summarized in Table 1.

FB in Air Passage

A total no of 17 subjects (9 in 2015 and 8 in 2016) (9.8% of total FB in aerodigestive tract in 2 years) were studied with FB in the air passage Figure 5. The youngest subject was one and half years old with seed ingestion while oldest one was 26 years old with nail (pin) in the air passage.

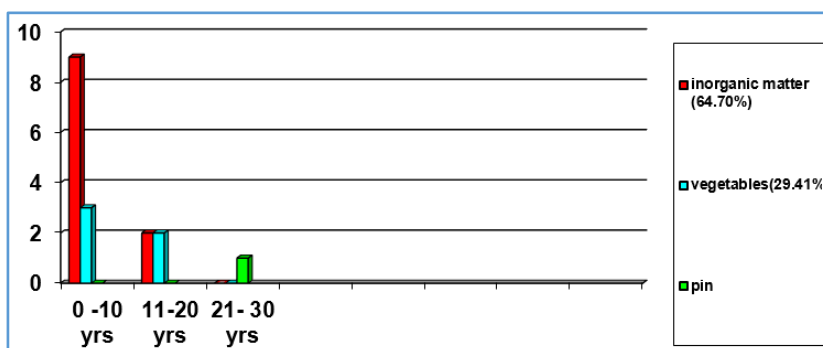


Figure 5. Age Distribution of Foreign Bodies of Air Passage in Jan 2015 to Dec 2016

In 13 patients, out of 17 patient foreign body was in the right bronchus (76.47%) and 4 in left (23.53%). Inorganic foreign bodies like whistles parts of toys etc. was the commonest, 11 out of 17(64.7%), 5 had organic seeds and 1 had a nail. All the FB was removed by rigid bronchoscopy under general anaesthesia.

Among FB in air passage in January 1997 to December 1998 which was total-12 in number out of which 9 in the right bronchus (75%) and rest 3 in left bronchus. Figure 6 describe that Inorganic material was 50% of total foreign body inhalation where vegetable foreign body consist of rest 50% of foreign body.

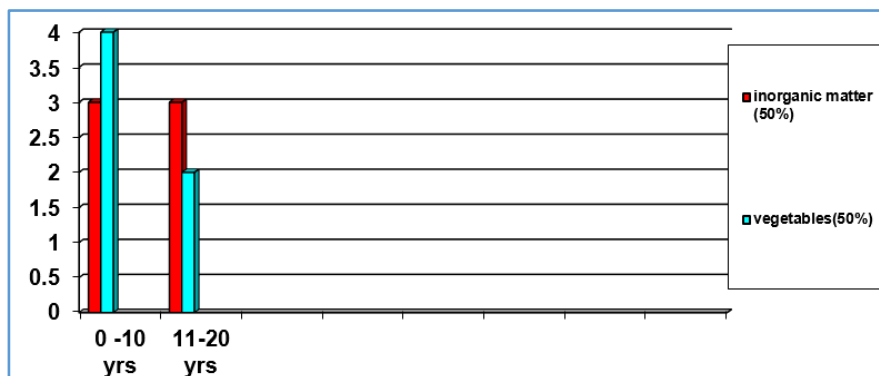


Figure 6. Age Distribution of Foreign Bodies of Air Passage in Jan 1997 - Dec 1998

Operative interventions and post procedure recovery were uneventful after removal of FB in both food and air passage.

Table 2 describe the distribution of inhaled foreign body in different bronchus. Most of the inhaled foreign body we found in right bronchus during the time period of January 2015 to December 2016 about 13 out of 17 about 76.47%. Retrospectively we found that 9 out of 12 foreign body inhaled during January 1997 to December 1998 were in right bronchus which consist of about 75% of all foreign body.

Year	Right Bronchus	Left Bronchus
Jan 2015- Dec 2016	13 (76.47%)	4(23.53%)
Jan 1997- Dec 1998	9 (75%)	3(25%)

Table 2. Foreign Body Distribution in Different Bronchi

Nature of Foreign Body in Different Year	January 1997- December 1998	January 2015- December 2016
Inorganic material	6 (50%)	11 (64.70%)
Vegetable matter	6 (50%)	5 (29.42)
Pin		1 (5.88%)
Total	12	17

Table 3. Foreign Body Distribution in Different Years

We found that there was also comparative increase of inorganic material foreign body of airway tract. During the session Jan 2015 to Dec 2016 about 64.70% patients had inorganic material foreign body which was just 50% during the session Jan 1997 to Dec 1998. The inorganic foreign body (pin/nail) was inhaled accidentally by a 26-year-old labour during his work table 3.

DISCUSSION

Due to the revolutionary work of Chevalier Jackson, broncho-oesphagoscopy got its individuality as a medical

science in 1949 to 1957.⁴ Regarding foreign bodies in airway and bronchus, the endoscope was first utilized for removal of FB in 1897; prior to this bronchotomy was the procedure used. Management of such patients was revolutionized by the technique and instruments developed by Chevalier Jackson in 1904. The mortality decreased from more than 20% to 2%.³

In their study, Hung W and Lin P⁵ found, 76% and 24.7% FBs in food passage and air passage respectively while Brooks et al found it 80% and 20% respectively⁶. In another large study 86.2% of FBs were in the pharyngo-oesophageal region, while 13.7% in tracheobronchial region.⁴

Our study revealed 90.69% FB in food passage and rest 9.3% in the air passage. Most are ingested by children younger than 10 years with the peak incidence between 6 months to 3 years as a sequel to natural tendency to put things in their mouth as reported earlier.^{7,8,9,10} In our study we found that children below 10 years are more likely to ingest coins and inorganic material.

Now, regarding preprocedural investigation and diagnosis, radiography, though important, was much more useful when the foreign body was radiopaque. So, it could be identified on the film or if there was a suspected complication that could be identified on the film such as lung collapse. Digoy also concluded that radiography in aerodigestive foreign bodies is much more important when dealing with oesophageal foreign bodies than airway foreign bodies.¹¹ So also in this study, only one FB i.e. pin (5.88%) was detected in chest X-ray in the bronchus, while mostly whistle and vegetables were radiolucent and not well diagnosed by radiology. So, a degree of suspicion is necessary and more than not a procedure in the form of endoscopy is mandatory to rule out foreign bodies specially in air passage which can be aided by pre procedure history taking (history of choking, cough, aspiration just after ingestion) and auscultation (Like in cases of whistle in air

passage a whistling sound is audible on auscultation and there may be associated decrease in breath sound in affected side). In 13 out of 17 subjects, FB was in the right bronchus (76.47%) and 4 in left (23.53%); thus, supporting the traditional observation that right bronchus being larger and straighter, invite FB more frequently¹². While dealing with FB ingestion we would stress upon some cardinal rules described by Dr Lawson³ which enhance the efficient and safe management of such cases.

These Rules are as follows-

1. Patients who say a foreign body is present are right until it is overwhelmingly clear there is no foreign body- i.e. a high degree of suspicion is always better.
2. The examination must be thorough. If areas cannot be visualized indirectly, then direct (endoscopic) examination must be done when a foreign body is suspected.
3. Negative radiological evidence does not rule out a foreign body.

Changing Nature and Possible Causes

Comparing with previous data of same institution we saw that the percentage of coin removal has decreased in 2015(31.64%) and 2016(29.87%) with respect to data of 1997 (46.03%) and 1998 (46.15%). The possible cause may be decrease in size of one-rupee coin which may be coming through stool on the next day which thus does not necessitate the procedures. Also, the % of artificial denture ingestion has slightly increased in the recent times due to its more frequent use 12.69% in 1997, 16.92% in 1998 to 18.98% in 2015 and 20.77% in 2016. However, the only significant trend change noted in inorganic foreign body impaction in food passage was increase from 22.22% in 1997 and 18.46% in 1998 to 30.37% in the year 2015 and 27.27% in the year 2016. There was also increase of the inorganic material foreign bodies in the later years 50% to 70.58% (11 inorganic + 1 pin) in air passage. The increased amount of inorganic foreign body is mostly due to urban development and improvement of prior socioeconomic status in last 15 years. Now the parents used to provide their children toys made of inorganic material which was mostly vegetable matter and coins in the past decade. But the parents do not have enough time in their hand to play with their children and due to inattention of the parents the broken piece of the toys and above said matters become foreign body and thus increasing the percentage of inorganic foreign body.

CONCLUSION

This study presents the distribution of FB ingestion in the aerodigestive tract and also gives an idea of the changing trend of the nature of foreign bodies i.e. increasing amount of inorganic material as foreign bodies except coins and its possible demographic causes at the same time.

We also recommend that parents should be instructed to take proper care of their children and should be careful when letting their child to play with broken toys and other inorganic materials.

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