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ORIGINAL ARTICLE

Clinical Profile and Management of Aerodigestive Foreign Bodies:A Prospective Observational Study

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Abstract

Objective : Foreign bodies in aerodigestive tract are one of the common emergencies in ENT. A suspicious mind with meticulous history taking may save many lives. The study is about the experience of aerodigestive tract foreign bodies in tertiary care hospital. **Study Design and Methods**: We carry a Observational study of about 352 patients who came or were referred to our department from August 2017 to August 2020. FB involving different parts of the aero digestive tract were included in the study. The site, side, symptoms and radiographic findings were recorded for each patient. Different procedures were used for retrieval of various FB at different locations.Majority of these procedures were performed under general anesthesia. **Results** : A total of 352 cases of aerodigestive foreign bodies were seen comprising of 224 males and 128 females in a ratio of 1.7:1. Age ranged from 6 months to 78 years. The group most at risk of aero digestive foreign bodies are those aged between 0 to 5 years. Common foreign bodies were coins, vegetative foreign bodies and parts of toys in children and meat bone and meat bolus and denture in adults. **Conclusion:** Aerodigestive foreign bodies are a common occurrence especially in the pediatric age group. Early detection and removal can forestall

Key Words

Aerodigestive, Airway,Bronchoscopy,Oesophagoscopy

Introduction

Inhaled or swallowed foreign body is a common occurrence in otorhinolaryngologic practice and is usually associated with a high rate of morbidity and mortality. [1]

This is a common phenomenon in young children, the elderly and mentally subnormal individuals, where the presentation is quite alarming and frightening for the guardians. The locations of the foreign body would usually determine the pattern of presentation. However, this is not always clearcut. Stridor or dyspnea of sudden onset in a child is essentially regarded as a case of impacted laryngeal foreign body until proven otherwise. [2,3]

Many factors have been attributed to the occurrence of upper aero digestive foreign bodies. These include poorly prepared food, hurried feeding , poor vision, mental retardation, drug addiction, intoxication and dentures. [4] The foreign bodies encountered in the aero digestive tract vary ranging from Whistles, parts of toys, coin, metallic objects, vegetative materials and dentures. [5] Dentures as aero digestive foreign body are seen commonly in adults with ill fitting long worn dentures. [6] The foreign bodies in children appear to have a predilection for the airways, while those in adults are more likely to be esophageal.

The study is carried out to create awareness, highlight causes ,pattern of presentation and their management.

Material and Methods

This is a three years prospective study of all patients who presented to the emergency department of ENT and Head and Neck Surgery, SMGS Hospital, Govt.

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Medical College Jammu. Patients with a diagnosis of aerodigestive foreign bodies from August 2017 to august 2020.This hospital cum medical college is the main teaching and referral hospital, where patients with aspirated and swallowed FB are mainly referred to and treated.

Ethical clearance was obtained from the intuitional ethics committee, GMC Jammu.

Data collected in the study included age and sex of the patients, time elapsed before presenting to the hospital, type and location of the foreign bodies, diagnostic and treatment techniques utilized and short term follow up of the patients. The FB locations were recorded as pharyngeal, upper esophageal(between 15 and 28 cm from the incisor teeth, middle esophageal(between 28cm and34 cm)distal esophageal (34 to the lower esophageal sphinter), tracheal and main bronchial regions.

All procedures were performed after patients were admitted to the hospital and under GA. When FB were visible in the pharynx or in the accessible segment of the upper esophagus, extraction was performed by Mc gill forceps. Rigid broncoscopes and rigid esophagoscopes were utilized when the objects were deeper in the aerodigestive tract. After each procedure, patients were observed in the hospital to see whether complication occurred or not.

Data were entered into spreadsheets and analysed for simple descriptive statistics using the SPSS statistics for windows version

Results

Most patients 122(47.6%)of foreign body ingestion belong to <10yrs age group with age ranging from 6 month to 80 years(*Table 2*)

Most cases 79(82.2%)of foreign body in airway belong to<10 year age group with age ranging 9 months to 40 years(*Table 2*).

The usual time of presentation in patients with FB in digestive tract varied from 3hours to 10 days. In 181(70.7%) cases, diagnosis was formulated with in 3-6h after the ingestion and in 56(21.8%) cases with a delay greater than 6h but not longer than24h;only in 19(7.4%) cases, the FB was detected after more than24h.Duration of foreign body lodgement in airway ranged from 6h to 1 month.56(58.3%) cases reported within 6-24h,24(25%) cases with in 1-3 days and 16(16.6%) cases with in 3 to 1month.

In patients with foreign body in digestive tract, the most common symptoms were dysphagia 122(47.6%), odynophagia 86(33.5%), foreign body sensation 54 (21.09%) and vomiting 39(15.2%).About 20(7.8%)patients were asymptomatic. With foreign bodies in the tracheobronchial passages, the most common sign and symptom were rhonchi and other attenuated sounds 36(37.5%) and dyspnea 37(38.5%) respectively. Other sign were decreased air entry in 44(45.8%) and hyper resonance in 9(9.37%) cases. The other symptom observed was cough in 34(35.4%) cases.

Most common foreign body in digestive tract was found to be coin in 121(47.2%)cases and least common paper pin in4(1.5%) cases. Maximum cases in airway showed vegetative foreign body 56(58.3%) and least cases showed safety pin, meat bone and bits of meat 1 in each group (*Table 3*).

The commonest site of lodgement in FB digestive tract was cricopharynx 150(58.5%) with esophagus 102(39.8%) and hypopharynx 4(1.56%).(Table 4).The commonest site of lodgement in FB airway tract was bronchus mainly in R bronchus 61(63.5%) and L bronchus 19(19.7%).Other sites are trachea 9(9.3%) and glottis 7(7.2%).(*Table 5*).

Discussion

Foreign bodies in upper aero digestive tract are relatively common particularly in children, but their presence in adults can by no means be ignored. Foreign body ingestion is a frequent occurrence in children with a peak in children older then 3 years. [7,8]

This age group may also be involved due to immature co-ordination in the swallowing mechanism. In the study of Steven C ,the average age of patients with foreign body aero digestive tract was 3 years. In the present study the incidence of foreign body in digestive tract was more as compared to airways that is similar to study by Brooks.[9] The tendency of the small children is to put whatever comes to their grasp into their mouth. Most of these foreign bodies are due to carelessness of the children,This includes improper preparation of the food, putting inedible objects in the mouth,talking while food is in the mouth, giving food like ground nuts to the children who are yet to get molar teeth to chew them ,leaving small objects in reach of babies and allowing them to play with buttons, small toys, coins, beads, etc. [10] It was observed in our study that majority of foreign bodies in trachea bronchial tree were found in the right bronchus. As in the series of Zarrella *et al* [11] While tenderness on palpation was an unreliable sign,pooling at indirect laryngoscopy invariably predicted a retained object.[12] The most common presentation of a foreign body in the airway were dyspnea and cough, which are similar to study by Kim *et al.* [13] Among the signs ,ronchi and other attenuated sounds was most common .There are no pathognomic signs of a retained foreign body; however, the presence of a triad of inspiratory stridor, wheezing,

Table 1. Gender wise distribution of aero digestive tract foreign bodies

s.no	Gender	Digestive Tract No	(%)	Airways No	(%)
1	Male	159	62.10	65	67.70
2	Female	97	37.89	31	32.29

Table 2 Age wise distribution of cases of aero digestive tract foreign bodies

S .No	Age(yrs)	Digestive tract	(%)	Airways No	(%)
1	<10	122	47.65	79	82.2
2	11-20	47	18.35	14	14.5
3	21-30	10	3.90	0	-
4	31-40	34	13.28	3	3.1
5	41-50	15	5.85	0	-
6	51-60	20	7.81	0	-
7	61-70	4	1.56	0	-
8	>70	4	1.56	0	-
Total		**256**	**100**	**96**	**100**

Table 3. Distribution of cases as per type of foreign body

Foreign body	Digestive tract	%	Airways	%
Coin	121	47.26	4	4.16
Meat bone	50	19.53	1	1.04
Denture	20	7.81	0	0
Meat bolus	32	12.5	0	0
Safety pin	10	3.90	2	2.08
Hijab pin	4	1.56	4	4.16
Plastic whistle	0	0	6	
Missellaneous(piece of glass,metallic FB)	9	3.51	0	0
Vegetative foreign body.	10	3.90	73	76.04
Walnut	0	0	6	6.25
Total	**256**	**100**	**96**	**100**

Table 4. Distribution of cases as per site of lodgement in Airways

sno	Site	No	Percentage(%)
1	Glottis	7	7.29
2	Trachea	9	9.3
3	Right main bronchus	61	63.5
4	Left main bronchus	19	19.7
	Total	**96**	**100**

Table 5. Distribution of cases as per site of lodgement in Digestive tract

S no	Site	No	Percentage(%)
1	Hypopharynx	4	1.56
2	Cricopharynx	150	58.5
3	Esophagus	102	39.8
	Total	**256**	**100**

and decrease air entry in a child with a history of sudden cessation of breath is highly suggestive of an airway foreign body. [14]

The most common site of lodgement is the cervical esophagus [15] as the cricopharynx is the narrowest part of the food passages and the relatively weak peristalsis in the upper esophagus makes this site The fact that the right bronchus was wider, shorter and more vertical than the left bronchus was contributory to aspiration being more common on the right side.

Table 6. Intervention done for Removal of foreign body in Airways

Sno	Site	Number	Percentage
1	Direct Laryngoscopy	7	7.29
2	Rigid Bronchoscopy	89	92.7
	Total	96	100

Fig. 1 X-Ray Soft Tissue Neck Lateral View showing metallic foreign body (Button) in cricopharynx

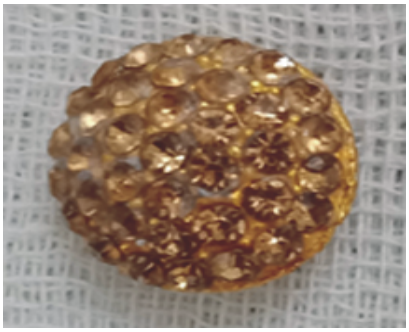

Fig. 2 : FB Button after removal from cricopharynx

Fig- 3 : X-Ray Lateral view Neck shows 2 coins in the cricopharynx

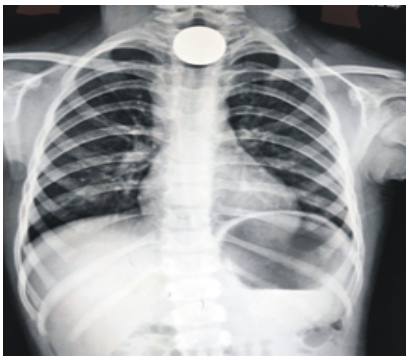

Fig-4: X-ray Neck A-P view shows coin in the cricopharynx

Fig. 5 : X-Ray STN lateral view shows air shadow (Meat Bolus) in cricopharynx

Fig. 6 :FB Meat Bolus after removal

In the tracheobronchial passages, our study shows the predominant site as right bronchus similar to other studies. [13,15]

Foreign body removal from throat is difficult and is associated with large numbers of complications in an inexperience hand. Most common of them are, injury to surroundings structures, perforations, injury to vocal cords and mediastinitis. Our study confirmed the earlier findings of Banerjee et al and Rothman *et al* [16] that the highest incidences of foreign body aspiration and ingestion were 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. Due to the decreased sensation of food in the oral cavity in denture wearers, small foreign bodies such as fish bones are commonly found lodged in the oropharynx.In addition, hastle during eating can lead to large boluses of meat lodging in the esophagus. In our study most common digestive tract foreign body was coin this is in accordance with the study conducted by Khan MA they also found that coin was the most common foreign body in aerodigestive tract.

The FB coin in the esophagus occupy classical position in coronal plane due to the fact that it is anteroposteriorly flattened.Therefore on an anteroposterior view of neck chest the whole coin can be seen showing a totally radioopaque shadow. On a lateral plane vertical slit like structure is seen. Sometimes foreign bodies like denture, pin, stones ,vegetative foreign bodies etc also present with radiological evidence. Chest radiography may reveal a variety of findings like unilateral air trapping, emphysematous changes as in partial obstruction, atelectasis, secondary pneumonic consolidation, and inspiratory obstruction or a combination of the findings may also be noted.

Conclusion

This study gives an insight into prevalence of foreign body in aero digestive tract. FB in the aero digestive tract constitute a constant hazard in all age groups especially in children and the elderly, which demands immediate action and management. Since a FB may cause acute threatening complications and since its chronic impaction can lead to atelectasis, infection,ulceration and necrosis of the mucosa, delayed treatment with observation is not recommended. Patients who say a foreign body is present are right until it is over whelmingly clear there is no foreign body. The examination must be thorough. Negative radiological evidence does not rule out a foreign body. Rigid endoscopy with forceps removal under general anaesthesia is the preferred management modality. Flexible endoscope is also an excellent tool especially for diagnosis and management of tracheobronchial FB. FB involved in the incident belong to classes of objects not conceived for children use and not suitable for their age. Therefore, educational strategies regarding safe behaviors have a key role in FB injuries prevention.

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Conflicts of Interest

There are no conflicts of interest.

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