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A study of upper aerodigestive tract in foreign bodies in a tertiary care hospital

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Abstract--Background : While foreign body ingestion and aspiration can happen to anybody at any age, children under the age of five make up the great majority of these mishaps. Foreign bodies in the airway, pharynx, and oesophagus continue to be a diagnostic and therapeutic challenge for practising otolaryngologists .Objectives:To find out the aetiology and prevalence of upper aerodigestive tract foreign bodies. Materials and Methods : The present prospective study was done by the Department of ENT at Chamarajanagara institute of Medical Sciences, Chamarajanagara from July 2021 to December 2021. All the patients with complains of upper Aero digestive tract foreign body during the study period were included in the study . A total of 175 study subjects were enrolled in the study during the study period. Results : In the present study the location of the foreign body was found to be in the Airway tract in 46.8% of the subjects and 53.2% of them in the digestive tract. In the digestive tract 63.4% was at the cricopharynx, 19.4% in oropharynx, 8.6% in mid and lower oesophagus,7.5% in posterior pharyngeal wall . Cough and respiratory distress was the main presenting complaints among the subjects who reported the obstruction in the airway canal and among those who had foreign body in digestive tract difficulty in swallowing , excessive salivation and pain was the chief complaints . Conclusion : Upper

aerodigestive tract foreign bodies still remain a diagnostic challenge to health care professionals, despite technological advances. A high index of suspicion and early diagnosis are the key to successful and uncomplicated management of these accidents.

Keywords---Foreign Body, Obstructive, Swallowing, Aerodigestive Tract.

Introduction

An endogenous or exogenous material that is inconsistent with the anatomy of the location where it is located is referred to as a foreign body. A foreign body, according to Chevalier Jackson, is "an item or a substance that is foreign to its location"¹.

While foreign body ingestion and aspiration can happen to anybody at any age, children under the age of five make up the great majority of these mishaps. Foreign bodies in the airway, pharynx, and oesophagus continue to be a diagnostic and therapeutic challenge for practising otolaryngologists. It is estimated that 150 children die each year from asphyxiation³. Aspiration mortality remains a major cause of death in children despite advances in public awareness and emergency care.^{2,3}

A strong index of suspicion for foreign body aspiration or ingestion is essential, because a foreign body might resemble other medical conditions, particularly without a witnessed occurrence. Hence there might be a delay in management, that may lead to difficulties. Suffocation by foreign body ingestion and aspiration is the third most common cause of unintentional death in infants under one year old and the fourth most common cause in children between one and six years old, according to the National Safety Council.^{4,5}

Boys tend to aspirate or eat accidentally twice as often as girls⁴. On additional examination, 80 percent of individuals with numerous oesophageal foreign body impacts have an oesophageal abnormality.³

Regardless of age or the apparent absence of symptoms and indicators, inquiry is necessary whenever a patient mentions a foreign body. Before a full examination is started, rare but dangerous consequences including recurrent pneumonia, atelectasis, lung/retropharyngeal or mediastinal abscess, or large bleeding caused by a vascular fistula may manifest.⁶

Appropriate x-rays are done on individuals who may have swallowed or aspirated a foreign item. In the first 24 hours following the original occurrence, radiographs in airway foreign bodies are generally normal, but they may turn abnormal over time.

The preferred course of action is speedy endoscopic retrieval. With just local anaesthesia, it is infrequently feasible to remove a foreign body from the nose,

oropharynx, or hypopharynx in a willing patient. Time has shown that rigid endoscopy is the safest and most effective treatment.³

Objective:

To find out the aetiology and prevalence of upper aerodigestive tract foreign bodies.

Materials and Methods :

The present prospective study was done by the Department of ENT at Chamarajanagara institute of Medical Sciences, Chamarajanagara from July 2021 to December 2021.

All the patients with complains of upper Aero digestive tract foreign body during the study period were included in the study . A total of 175 study subjects were enrolled in the study during the study period .

Inclusion criteria :

1. All age groups with history of foreign body aspiration / ingestion.
2. Patients with complications of foreign bodies even without a history.

Exclusion criteria :

1. Patients not willing for study.
2. Animate foreign bodies were excluded from the study

A pre-structured questionnaire was used to elicit a thorough history, which included the circumstances surrounding the foreign body's aspiration or ingestion, symptoms, and clinical characteristics. In each case, the respiratory system, abdomen, ears, nose, and throat were thoroughly examined. Antero-posterior and lateral images of the soft tissue neck were obtained for foreign bodies in the throat. If the foreign body wasn't there, no x-rays were taken.

For all patients who had eaten foreign objects, chest x-rays and plain abdominal x-rays were obtained. If computerised tomography of the neck and chest was deemed required, it was also done. If necessary, a computerised tomography and x-ray of the nose and nasopharynx were performed. In individuals with a significant history of foreign bodies, endoscopic examination was performed if x-rays did not show a foreign body. The proper lab tests were performed.

Procedures carried out were,

1. Office procedure: It was used to remove foreign objects from the nose, base of the tongue, and facial tonsils. Under local anaesthetic, it was performed. The foreign body was removed with the proper tool.

2. Nasal endoscopic removal: Under local or general anaesthesia, this technique was utilised to remove foreign bodies from the nose and nasopharynx.

3. Rigid endoscopy: The rigid endoscope, such as a direct laryngoscope, oesophagoscope, or bronchoscope, was utilised depending on where the foreign body was located.

All patients who underwent surgery while under general anaesthesia were monitored for 24 hours following the procedure, and after 48 hours, repeat or 43 check x-rays were taken to look for airway foreign materials.

As follows:

1. Endoscopic drainage : usually done for Retropharyngeal abscess. The location of the largest bulge was felt using rigid oesophagoscopy, and a linear incision was performed to drain the abscess. Antibiotics and analgesics were administered on the patient after a Ryle's tube was implanted.

2. Tracheotomy: for patients with foreign bodies in the central airways that are difficult to remove by standard bronchoscopy.

3. Thoracotomy: When a foreign body obstruction cannot be removed with bronchoscopy. The incision was a typical thoracotomy incision.

All information was recorded, tabulated, and analysed, including the patient's age at presentation, the kinds of foreign bodies, clinical characteristics, radiological and endoscopic findings, the operations performed, the results, hospital stay, and complications.

Procedures that were endoscopic and open were used in the event of problems. tallied and examined.

1. endoscopic drainage for retropharyngeal abscess .The location of the largest bulge was felt using rigid oesophagoscopy, and a linear incision was performed to drain the abscess. Antibiotics and analgesics were administered on the patient after a Ryle's tube was implanted.

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Table 1: Social Profile of the study subjects

		Frequency	Percentage
Age Group	< 12 years	118	67.4
	12 to 20 years	6	3.4
	20 to 30 years	7	4
	30 to 40 years	14	8
	>40 years	30	17.2
Gender	Male	90	51.4
	Female	85	48.6

In the present study majority 67.4% of them were aged less than 12 years of age , 3.4 % of them were between 12 to 20 years of age , 4% were 20 to 30 years of age , 8% were 30 to 40 years of age and 17.2% were aged more than 40 years of age . Nearly 51.4% of them were male and 48.6% were female in the present study .

Table 2 : Location and description of the Foreign Body in the study subjects

		Frequency	Percentage
Location of Foreign Body	Airway	82	46.8
	Digestive Tract	93	53.2
Objects in Airway	Food articles	29	35.4
	Plastic/beads	24	29.2
	Chalk	13	15.7
	Stones	7	8.5
	Others	10	12.2
Objects in Digestive Tract	Coins	45	48.4
	Bone fragments	26	27.9
	Metals/ Sharps	13	13.8
	Seeds/Nuts	8	8.6
	Other	4	4.3

In the present study the location of the foreign body was found to be in the Airway tract in 46.8% of the subjects and 53.2% of them in the digestive tract. On Analysis of the type of objects seen in the airway 35.4% of them were food articles , 29.2% of them were plastic beads ,15.7% was chalk , 8.5% was stones and 12.2% of them were other items . In the digestive tract 48.4% was coins , 27.9% of them were bone fragments , 13.8% of them were metal sharps ,8.6% of them were seeds or nuts .

Table 3: Location of Foreign Bodies in the Airway and Digestive tract

		Frequency	Percentage
Airway Tract	Nasal Cavity	63	76.8
	Tracheobronchial tree	19	23.2
Digestive Tract	Oral cavity	1	1.1
	Oropharynx	18	19.4
	Cricopharynx	59	63.4

	Mid and Lower Oesophagus	8	8.6
	Posterior Pharyngeal wall	7	7.5
Symptoms of Foreign Body in nasal Cavity	Cough	53	64.6
	Respiratory Distress	26	31.7
	Chest pain	13	15.8
	Cough and Distress	15	18.3
	Pain	6	7.3
Symptoms of Foreign Body in Digestive tract	Difficulty in swallowing	68	73.2
	Excessive salivation	58	62.3
	Pain	56	60.2
	Vomiting	37	39.7
	Distress	16	17.2

The location of the foreign body in the airway tract was found to be 76.8% in nasal cavity , 23.2% in tracheobronchial tree . In the digestive tract 63.4% was at the cricopharynx, 19.4% in oropharynx, 8.6% in mid and lower oesophagus,7.5% in posterior pharyngeal wall .

Cough and respiratory distress was the main presenting complaints among the subjects who reported the obstruction in the airway canal and among those who had foreign body in digestive tract difficulty in swallowing , excessive salivation and pain was the chief complaints .

Table 4 : Treatment of the Foreign Body in the study subjects

		Frequency	Percentage
Procedure	Direct Removal	56	32
	Endoscopic Removal	115	65.7
	Tracheotomy	2	1.1
	Throctomy	1	0.6
	Incision and Drainage	1	0.6
Endoscopic Procedure	Oesophagoscopy	63	54.8
	Bronchoscopy	29	25.2
	Direct Laryngoscopy	23	20
Outcome	Successful Removal in 1 st attempt	170	97.1
	Successful Removal in 1 st attempt	5	2.9

The foreign body was removed by the endoscopic method in 65.7% of the subjects , 32% of them by direct removal , 1.1% trachotomy was done . Using endoscopic procedure 54.8% was done by oesophagoscopy,25.2% by bronchoscopy and 20% by direct laryngoscopy. 97.1% of them subjects the foreign body removal was done in the 1st attempt it self .

Discussion

The research involved 175 patients in total. There were 85 women and 90 men among them. There were 93 foreign bodies in the digestive system and 82 in the

airways. There were 93 in the digestive system, 63 in the nasal cavity, and 19 in the tracheobronchial channel.

As in this study, research by Jackson et al¹, Lin C T⁷ and Black RE et al⁸ has revealed that children under the age of 10 are more vulnerable for foreign body aspiration and in the study done by Baharloo F et al⁹ the peak age of incidence of foreign body aspiration was found to be around 2 years of age .

Men made up 51 percent of the foreign bodies, compared to females' 47.8 percent, while females There was no discernible change in the sex distribution across investigations done by Brooks J W et al,¹⁰ Jackson et al¹ and Lin et al⁷.

The most common location of foreign body was in nose, which is consistent with the findings of Francois M et al¹¹ and Ikino CMY et al¹². The bulk of foreign bodies found in the tracheobronchial tract belonged to children between the ages of 1 and 2. There were several different kinds of alien bodies. Nuts and seeds were the most prevalent in children's airways. This finding is supported by a research by Sethi DS¹³, Baharloo F et al⁹.

Adults very seldom aspirate foreign bodies, and sharp items were more prevalent. Adults are more prone to aspirate non-food objects, according to a Sharma et al.¹⁴ research. Children's choking symptoms in the tracheobronchial tract are related to coughing. Few of them experienced respiratory problems. This was consistent with the research results of Baharloo F et al⁹. In the research by Ambe P et al¹⁵, choking episodes were discovered in 96 percent of cases.

Compared to adults, coins were more prevalent in children's digestive tracts. Bone fragments were the most frequent foreign body in adults. Similar findings were made in the studies conducted by Kamat et al¹⁶ and in the coastal regions of South India . Swallowing problems were the most typical symptom, followed by throat soreness. This finding is consistent with research by Murty P S N et al¹⁷ and SharmaHS et al.¹⁴ According to Cannoly et al.,¹⁸ pain localisation is more accurate in pharyngeal foreign bodies than in the oesophagus. Saliva pooling was seen in our investigation, however the occurrence was lower compared to Jones NS et al findings. (85 percent).

The cricopharynx accounted for 74% of all foreign body impaction cases in the throat. This also fits in well with research by Murty PSN et al.¹⁷, Sharma H S et al.¹⁴, and a number of other researchers.

Conclusion

Upper aerodigestive tract foreign bodies still remain a diagnostic challenge to health care professionals, despite technological advances. A high index of suspicion and early diagnosis are the key to successful and uncomplicated management of these accidents.

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