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ORIGINAL ARTICLE

Foreign body in esophagus of children with previous esophageal surgery history

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ABSTRACT

Objective: In cases with esophageal atresia, foreign bodies can be impacted in the anastomotic area due to both the family's efforts to feed solid food and anastomotic stenosis or fibrosis. Admittions of foreign body ingestions in cases with a history of esophageal surgery were evaluated in this study.

Material and Methods: The demographic features of esophageal atresia cases operated between January 2004 and January 2019 who underwent esophagoscopy for foreign body ingestion were evaluated retrospectively.

Results: During the 15-year study period, esophagoscopy was performed 21 times due to foreign body ingestion to 10 of 137 surviving cases (7.3%) who underwent repair of esophageal atresia. The mean age of the patients was 32 months (10–72 months), and 7 (70%) were male and 3 (30%) were female. Six (60%) had undergone primary esophageal repair with fistula ligation and two (20%) had undergone gastric tube replacement. Three (30%) required esophageal dilatation; one had resection + anastomosis after 6 dilatations and one had antireflux surgery. Nine (90%) patients presented with dysphagia, 4 (40%) with vomiting, 1 with retching, and 1 with hypersalivation. Five (50%) patients had a history of ingesting foreign bodies (juice bag, money, carrot, plum seed, gum), three of which had complaints for 1 month, and 7 presented in an average of 2 days (1–5 days). In one of the patients, direct X-ray showed a coin in the esophagus. Esophagography showed foreign body in 4 of 6 cases. One was not effective due to incompatibility in a patient with cerebral palsy, and he vomited the plum core as soon as the opaque solution was administered orally. Esophagoscopy revealed no foreign body in two patients, organic food in five, shell of peanut in one, money in one, and chunks of gum and paper in one. In seven patients, the foreign body was lodged at the site of the anastomosis; dilatation was performed in 4 due to anastomotic strictures. In the follow-up period, five patients were admitted for the same reason. No foreign bodies were detected in re-esophagoscopy in three patients. Apple-plum seeds were removed twice from one patient, and various organic and inorganic materials [food, watermelod seed, gum, piece of paper (thrice)] were removed six times from another patient. The mean length of stay was 2.8 days (2–5 days).

Conclusion: Although it was thoroughly explained to the parents of cases with esophageal atresia that the transition to semi-solid/solid foods should occur after the age of five years, when the children learned to chew and swallow, the patients were not fed with suitable food for their age.

Keywords: Esophagoscope, esophageal atresia, foreign body swallowing.

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INTRODUCTION

Esophageal foreign bodies are a current, widespread problem among children and can cause serious morbidity and mortality if not timely intervened.[1] Although the etiology is reported mostly as an accident, neglect of caretakers may also be involved.[1]

Although not foreign bodies, food may get lodged in the esophagus due to dysfunctional chewing, which is frequently seen in infants.[1] Children between the ages of 6 months–6 years tend to have problems with the foreign bodies they put in their mouths.[2] They may swallow foreign bodies their older siblings give them. In adolescents, foreign body ingestion may be the result of psychiatric disorders and often present recurrently.[3]

The previous gastrointestinal system surgery, gastroesophageal reflux, eosinophilic gastritis, neuromuscular disorders, congenital esophageal malformations (stenoses, fistula, and diverticules), or functional abnormalities increase the risk of lodging of the ingested foreign body in the operated area or the site of abnormality.[4] These patients may be at higher risk for foreign body obstruction or esophagus perforation.[5,6]

In this study, it was aimed to determine the mortality and morbidity after ingestion of a foreign body in children operated for esophageal atresia.

MATERIAL AND METHODS

Hospital records of patients who underwent esophageal atresia repair between January 2004 and 2019 in our hospital and presented with foreign body ingestion were evaluated retrospectively.

Children who required esophagoscopy due to the foreign body ingestion were examined for age, gender, previous surgical procedures, symptoms of admission to the department (such as difficulty swallowing, vomiting, retching when swallowing, and hypersalivation), onset time of symptoms, history of a foreign body ingestion, radiological examination findings, esophagoscopy findings, nature of the foreign body (organic/inorganic materials), location of the foreign body, esophageal anastomosis, dilatation requirement after esophagoscopy, duration of hospitalization, outcome, and recurrence of foreign body ingestion from the hospital registry. The data were uploaded to SPSS program for analysis.

A 2-year-old case that underwent primary esophageal repair and was hospitalized in our department with severe pneumothorax 1 day after removal of the foreign body lodged in the esophageal anastomosis site at another hospital was excluded from the study.

Before the study was conducted, the ethics committee approval (dated September 18, 2019, numbered 85) was obtained from the Zeynep Kamil Maternity and Children's Diseases Health Training and Research Center Clinical Research Ethics Committee.

This study was carried out according to the rules of the Helsinki Declaration.

RESULTS

Esophagoscopy was performed for foreign body ingestion in 10 (7.3%) of 137 patients who were operated due to esophageal atresia in our department and survived within 15 years. The average age of ten patients was 32.10 months (10–72 months); seven (70%) were males, and three (30%) were females.

Among these ten patients, two had isolated esophageal atresia and underwent gastric tube replacement at 1 year of age, six had esophageal atresia with distal tracheo-osephageal fistula and underwent primary esophageal repair, and two underwent late primary esophageal repair at 2 months of age. Resection and anastomosis were performed in one of the ten cases after six dilatations, while another case required antireflux surgery.

Nine cases (90%) presented with complaints of difficulties in swallowing, four (40%) with vomiting, one with retching while swallowing, and one had hypersalivation. Five (50%) had previous histories of foreign body ingestion (such as juice bag, money, carrot, plum kernel, and chewing gum). In three cases, complaints had lasted for 1 month, and seven cases were admitted in an average of 2 days (1–5 days).

One of the direct radiographs showed money in the esophagus. Esophagography could not be performed effectively in one case with cerebral palsy due to agitation, and another case vomited a plum kernel as soon as the radio-opaque fluid was administered orally. Among six cases in which esophagography were obtained, four had suspicion of foreign bodies lodged in their esophagi.

Esophagoscopy was performed in ten cases, among which foreign body was not detected in two, and organic food pieces were removed from five. A pistachio shell, money, as well as gum and paper pieces were removed from one patient each. In seven cases, the foreign body was at the site of anastomosis, and four of cases had severe anastomotic stenosis. After the foreign body was removed, esophageal dilation was performed. One had traumatic pneumothorax, but tube thoracostomy was not required, and spontaneous resolution occurred in 3 days.

During follow-up, five patients presented with recurrent foreign body ingestion; however, no foreign bodies were detected in the repeated esophagoscopy of three cases.

Foreign bodies were removed from the first case two separate times (apple and a plum seed). The second case underwent esophagoscopy 6 times, during which numerous foreign bodies were removed (organic food + watermelon seed, organic food + chewing gum, and paper pieces 3 times) from the esophageal anastomosis site. A total of 21 esophagoscopies were performed in ten children due to foreign body ingestion or its suspicion, 18 foreign bodies were removed from the esophageal anastomosis site, and no foreign bodies were detected in three esophagoscopies. The mean length of hospital stay was 2.8 days (2–5 days).

A patient who underwent gastric tube replacement at 1 year of age due to isolated esophageal atresia was hospitalized with complete stenosis at the site of the esophageal anastomosis due to foreign body ingestion 4 years later. A pistachio shell was removed with great difficulty from the esophagostomy orifice esophagoscopically and manually (Fig. 1a–c). A tracheo-oesophageal fistula was determined at the level of the esophagostomy orifice later during follow-up. The fistula was repaired, and esophagostomy was closed 3 times due to recurrence. Summary of our results in Table 1.

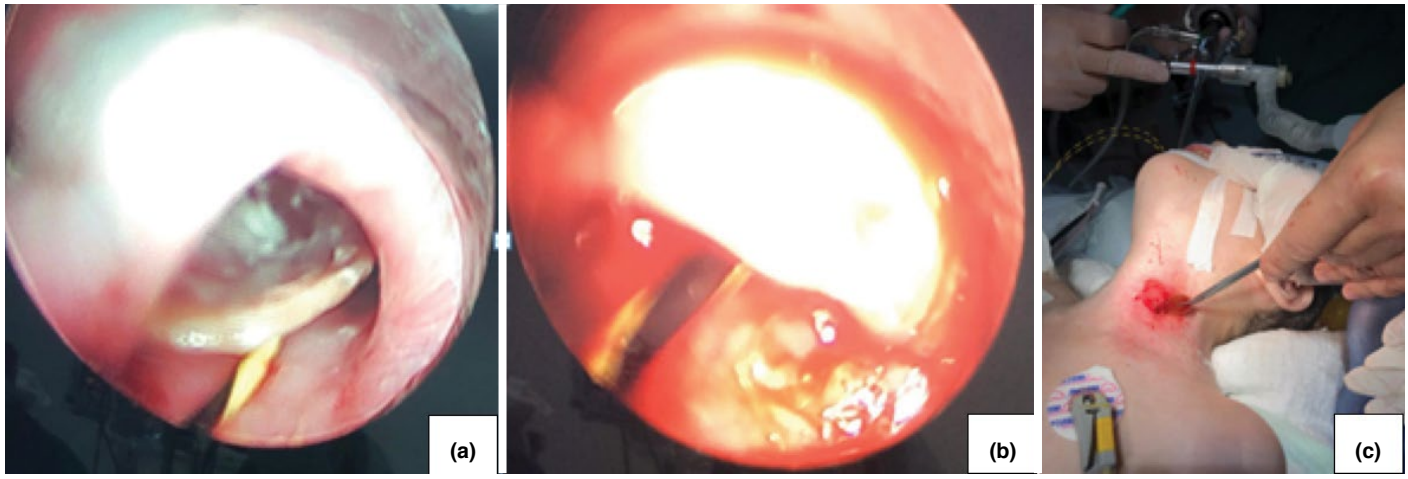

Figure 1: Esophagoscopically, the guidewire was advanced from the edge of the pistachi-shell to the stomach **(a, b)**. The pistachio-shell which cannot be removed by esophagoscopy, it was very hard removing from the esophagostomy orifice **(c)**.

DISCUSSION

The presence of a foreign body in the esophagus, which can cause serious morbidity and mortality, is an emergency requiring timely intervention, much like a foreign body aspiration. It should be kept in mind that foreign bodies can cause vomiting, aspiration, and respiratory distress due to tracheal compression, especially in young children.[7]

The clinical presentation, causing airway compromise is seen in 10% of the cases.[8] Around 80–90% of foreign bodies in the gastrointestinal tract spontaneously pass without complications, 10–20% are removed endoscopically, and 1% require open surgery secondary to complications. Therefore, foreign body ingestion is an important clinical condition in pediatric gastroenterological practice.[9] Timing of an intervention for foreign body and esophageal food impaction are dependent on multiple factors, which include patient age and clinical condition, the location and characteristics of the ingested material, time since ingestion, and the technical capabilities of the endoscopist and facility. Based on these factors and perceived risks of aspiration, obstruction, perforation, and other potential complications, as well as the likelihood of procedural success, the timing and nature of endoscopic intervention are determined. Urgent endoscopy is required in patients who are unable to swallow due to swallowed sharp objects or disk batteries (Preferably within 2 h, and at latest within 6 h).[10]

However, no signs or symptoms may occur in pediatric foreign body ingestion. Since not all incidences of foreign body ingestions are known by caregivers, the possibility of non-specific symptoms caused by foreign body ingestion should always be considered.[2]

Patients with foreign body ingestion may present with various symptoms, such as vomiting, the feeling of something stuck, odynophagia, and dysphagia. In addition, some patients or their parents may indicate a history of difficulty swallowing.[2] While the most common finding in a study was odynophagia and inability to swallow, seen in 75% of the patients,[11] in another study conducted with 1343 individuals who ingested foreign bodies, 79 (5.8%) were lodged in the esophagus, while retrosternal pain and dysphagia were present in approximately 4.7%.[12] It was observed that 90% of our patients had difficulty of swallowing. In a study, young children, who could not express that they have swallowed foreign bodies, presented with

Table 1: Summary of our results

	n	%
Sex		
Male	7	70
Female	3	30
Operation history		
Primary esophageal repair with fistula ligation	6	60
Gastric tube replacement	2	20
Isolated EA, late primary esophageal repair	2	20
Esophageal dilatation history	3	30
Resection+anastomosis history	1	10
Antireflux surgery history	1	10
Symptoms		
Dysphagia	9	90
Vomiting	4	40
Retching	1	10
Hypersalivation	1	10
History of ingesting foreign bodies	5	50
Foreign body seen in direct radiography	1	10
Foreign body seen in esophagography (performed in 6)	4	40
Operation findings		
No foreign body	2	20
Organic food	5	50
Shell of peanut	1	10
Money	1	10
Chunks of gum+paper	1	10
Foreign body in the anastomosis region	7	70
Dilatation was performed	4	40
Admitted for the same reason	4	40

complaints that parents noticed, such as restlessness, gagging, not eating and drinking, and constant swallowing reflexes. It was stated that one fourth of the patients did not have any obvious complaints and findings and that the patients swallowed a foreign body either by themselves or when with their relatives.[7] In our study, half of our cases had a history of foreign body ingestion.

In a study of 435 patients who presented for foreign body swallowing, most of the cases (n=239) were male, as in our study. The mean age of the patients was 3.66±2.85 years (1.5 months–14 years).[13] In our study, our youngest case is 10 months old and oldest is 6 years old, and it supports the most common ages of 6 months–6 years in the literature.[2]

In a study of 88 patients who had a foreign body removed from the esophagus by esophagoscopy without a history of esophageal atresia, the average admission time was 1 day while it was 2 days in our study.[11] This suggests caregivers of children who underwent esophageal surgery apply to the hospital later because they already have problems swallowing. In three of our cases, complaints had lasted for a month. Exacerbation may occur due to the stenosis in the esophagus anastomosis site, or occasional lodging of softer or smaller pieces of foreign bodies.

The plain radiography may be the most useful research for opaque foreign body ingestion or aspiration. Radiography can show the location, number, size, and shape of any foreign based on its radiopacity.[2] A limitation is that some foreign bodies are not radiopaque subjects and cannot be seen in plain X-rays.[2] It is important to see the neck area in thorax X-ray to see the foreign bodies in the proximal esophagus.[14] If X-ray positioning is not possible, objects can be found using an esophagogram.[2] In one of our cases, it was observed that the money was in the esophagus on direct radiography; and esophagography suggested a foreign body in four of our six cases. An effective radiography was not performed due to agitation in a case with cerebral palsy, and another case vomited with a plum seed as soon as radiopaque liquid was administered orally before esophagography.

Among the coins, fish bones, pins, button batteries, magnets, household items, and many more items found in such cases, the most common items found in most countries were coins.[2,11,12] In many studies, it has been found that organic foreign bodies are found less than inorganic foreign bodies.[4,13] However, in our cases, organic foods were found more than inorganic foods, which are believed to be due to the inelasticity of the anastomosis line in our patients, especially due to the previous esophageal surgery. In addition, since esophageal clearance is impaired in esophageal atresia, solid foods become particularly difficult to pass down the anastomosis line.

Most foreign bodies stuck in the gastrointestinal tract are lodged at the level of the cricoid cartilage, arcus aorta, and gastroesophageal junction in the esophagus.[13] Foreign bodies can also be lodged at the anastomotic or surgical site in patients with the previous esophageal surgery and corrosive esophagitis.[13] Other underlying disorders in esophageal food impaction are eosinophilic esophagitis, Schatzki's ring, peptic stricture, radiation-induced stricture, esophageal carcinoma, Zenker's diverticulum, Non-Zenker's esophageal diverticulum, post-surgical (e.g., fundoplication), achalasia, and other spastic dysmotilities.[10] In seven of our cases, the foreign body was in the anastomosis region; four of them had anastomotic stenosis and dilation was performed.

During the removal of the foreign body or in cases with late admission, 1–5% complications can be observed in the esophagus.[11] Esophageal obstruction is the most common complication of foreign body intake in children.[15] When the foreign body stays in the esophagus for 24 h, there is a strong possibility of complications such as esophageal injury, erosion, and perforation.[2] Early removal of foreign body prevents the development of complications such as mediastinitis, pneumonia, pneumothorax, pneumomediastinum, peritonitis, abscess, ulceration, aortoesophageal fistula, bleeding, obstruction, and migration.[16] In one of our cases, traumatic pneumothorax not requiring tube thoracostomy developed. In addition, a tracheoesophageal fistula was found in the late follow-up of our case, which was repaired from the esophagostomy site after an exceedingly difficult removal of pistachio shell.

In the case of unusual or recurrent foreign body ingestion and psychosocial concerns, a mental health professional should immediately assess the child.[16] In our study, five patients re-applied for the same reason, and three had no foreign bodies in re-esophagoscopy. Apple and plum seed were removed 2 times and organic food + watermelon seeds, organic food + chewing gum, paper pieces were removed 6 times. The patient, who was admitted 6 times with foreign body ingestion, was referred to the child psychiatrist for the 3rd time with the same complaint. In one study, 70.4% of the patients without complications were discharged within the first 24 h, while the other cases were kept under observation for 24–48 h.[11] In our study, dilatation due to both esophageal surgery and anastomosis stenosis in 40% of the patients increased our average hospitalization period.

Children with foreign body lodged in the upper gastrointestinal tract can be effectively treated by an experienced pediatric surgeon by safely removing such foreign objects using pediatric and appropriate auxiliary endoscopic equipment. However, it is necessary to carefully consider the type of foreign body swallowed, the age of children, expected complications, and emergencies. It is also important to ensure an effective coordination between the medical practice system and medical staff and equipment.[9]

CONCLUSION

We have repeatedly explained to parents of patients operated due to esophageal atresia that feeding with semi-solid and solid foods should begin after the age of five, when these children learn to chew and swallow. However, these patients were all fed with inappropriate foods for their age by their parents. Rigid endoscopy is a highly effective and safe procedure for foreign body removal even in patients with previous esophageal surgery; but the foreign body must be removed as soon as possible.

Statement

Ethics Committee Approval: The Zeynep Kamil Women and Children Training and Research Hospital Clinical Research Ethics Committee granted approval for this study (date: 18.09.2019, number: 85).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – ODA; Design – ODA; Supervision – ODA, AC; Resource – ODA, AC; Materials – ODA, AC; Data Collection and/or Processing – ODA, BE; Analysis and/or Interpretation – ODA, BE; Literature Search – ODA, BE; Writing – ODA, AC; Critical Reviews – ODA, AC.

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