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Research Article

Foreign bodies in oesophagus, stomach or duodenum: A case-series in adult patients

RJLF Loffeld MD PhD

Department of Gastroenterology, Zaans Medisch Centrum Zaandam, The Netherlands

***Corresponding Author**

RJLF Loffeld MD PhD

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Abstract: *Introduction:* Sometimes people ingest a foreign body. Mostly this is food that got impacted in the oesophagus. Endoscopic intervention is needed. The aim of the study is to describe abnormalities in the upper gastrointestinal tract possibly responsible for the impaction. *Material and methods:* A case series is presented of patients who underwent endoscopy because of a foreign body. *Results:* Mostly the foreign body that got impacted in the oesophagus was food or meat. In almost 40% of cases there was some structural abnormality present in the oesophagus partly responsible for the impaction. In all patients with a foreign body located in stomach or duodenum no structural abnormalities were detected. Mostly, the foreign body could be removed by pushing it into the stomach. Complications of the ingestion or procedure did not occur. *Conclusion:* Food impaction occurs and is mostly the result of swallowing without chewing.

Keywords: Upper gastrointestinal endoscopy; foreign body; food impaction.

INTRODUCTION

Upper gastrointestinal endoscopy sometimes is done because of food impaction or the ingestion of a foreign object. Complications of ingestions of foreign bodies can occur. Via endoscopy the problem mostly can be solved in a relatively simple manor. It can be removed with a grasping device, a snare or a net retriever, or it can be pushed into the stomach, especially if the foreign body is food or meat.

The present case-series describes consecutive patients in a long period of time who underwent upper gastrointestinal endoscopy because of food impaction of ingestion of a foreign object in order to identify the reason for the impaction and the occurrence of complications directly related the ingestion or the endoscopic procedure.

PATIENTS AND METHODS

A large prospectively dataset on upper gastrointestinal endoscopy collected in the department of Gastroenterology of the Zaans Medisch Centrum, was used. All the endoscopy records were searched for the term "foreign body" in the diagnosis section. In addition, for every patient the data set was searched for previous endoscopies or procedures done after the ingestion of the foreign body. Abnormalities seen were scored. Also hospital records and pathology reports were searched for additional information.

Since the turn of the century, ingestion of foreign objects in pediatric patients is not treated and followed anymore by the "adult" gastroenterologist. These patients are treated by the pediatric gastroenterologist if necessary.

Statistical analysis was done with t-test and chi-square test for contingency tables. A value below 0.05 was considered significant.

RESULTS

The data-set comprised of 39096 consecutive endoscopies of the upper gastrointestinal tract, covering a period of more than 25 years. One hundred seventy five procedures (0.44%) were done in 143 patients with foreign body in the upper part of the digestive tract. This foreign body was located in stomach or duodenum in only 7 cases (4.8%). All other patients had a foreign body stacked in their oesophagus.

Only 7 children were treated (3 boys, 4 girls)(mean age 6.3, range 3-13 years). Six of these children were treated in the nineties of the previous century. Unfortunately only from two patients data

could be retrieved from the files. One child had a coin stuck in his oesophagus, 21 years later he was diagnosed with eosinophilic oesophagitis, the other patient had a sharp object stuck in her duodenum that could be retrieved with a net.

From 14 patients (9.7%) (including five children) no data could be retrieved on the kind of foreign body.

Two groups of adult patients were seen. Persons who only had once impaction of a foreign body (group 1,mean age 57 years, range 17-94), and those who had repeated impactions (group 2, mean age 56 years, range 18-99). There was no difference in gender between the two groups (table 1).Table 2 shows the nature of the foreign body in both groups of patients. The patients of group 2 significantly had more often meat stuck in their oesophagus.

The foreign bodies in duodenum or stomach were granules from plant hydro-cultures, a pigtail stent used for marsupialisation of a pancreatic pseudocyst, a package of drugs, a toothpick, a door key, razor blades and a pushpin.
In three cases the ingestion of the foreign body was done deliberately, all other case were accidents.

Upper gastrointestinal endoscopy showed no abnormalities in oesophagus, stomach or duodenum in all cases in which the foreign body was located in stomach or duodenum.

Structural abnormalities in the oesophagus were seen in 54 out of the 136 patients (38%). Table 3 shows the abnormalities. There was no difference in occurrence of abnormalities between both groups of patients.

Histological examinations were done in 11 patients in group 1(13%) and 9 (36%) in group 2. In group 1 5 cases of eosinophilic oesophagitis were diagnosed. None in group 2.

Table 4 shows the endoscopic intervention done in all cases. The foreign object, being mostly meat, was pushed successfully into the stomach in a significant higher number of patients in group 2. The foreign body also was retrieved with a grasping device, a snare or a net retriever.

No complications occurred from the endoscopic procedure nor the ingestion of the foreign body. The pigtail stent was left in the stomach for further drainage of the pseudocyst.

Figure 1 shows the number of patients with a foreign body in the course of the years. There is a clear rising in yearly incidence.

Table 1. Distribution of cases

	Men	Women
Group 1	68	43
Group 2	18	7

Table 2. The nature of the foreign body in both groups of patients

	Group 1	Group 2
Meat	46	18
Food	31	4
Miscellaneous	14	2
	P = 0.05	

Table 3. Structural abnormalities

	Group 1	Group 2
Stenosis/ Schatski	22	7
Hiatal hernia	31	11
Oesophagitis	13	6
Barrett's	6	0
	P = ns	

Table 4. The endoscopic intervention done in both groups of patients.

	Group1	Group 2
Pushed towards the stomach	66	23
Removed	31	2
	P = 0.01	

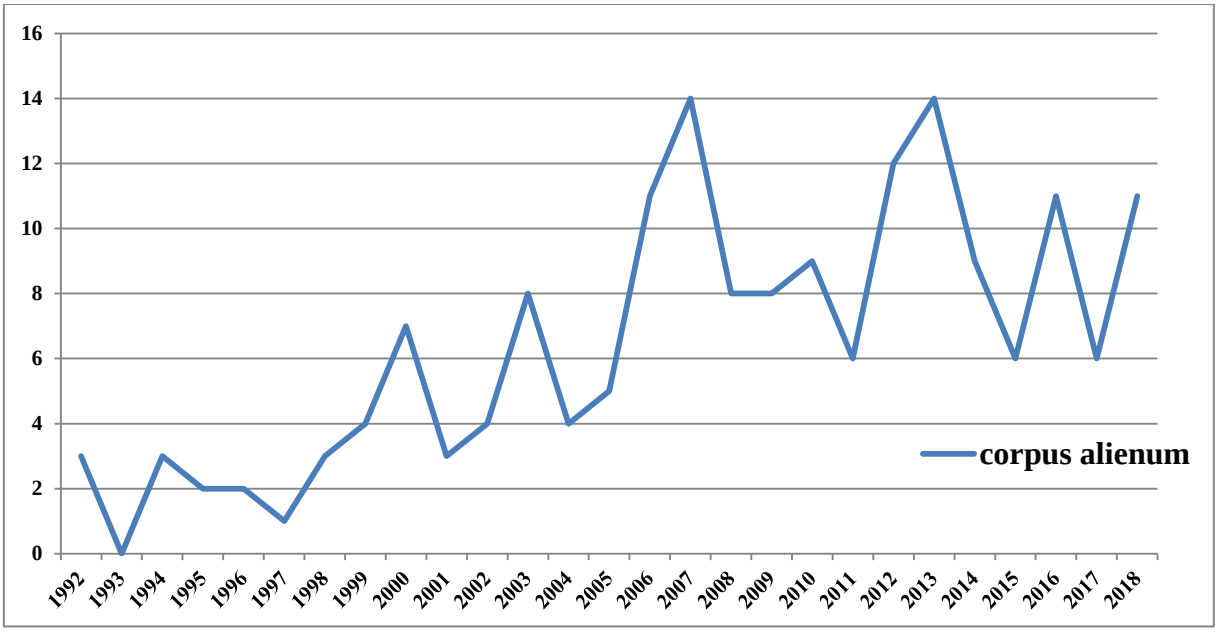

Figure 1. The yearly number of patients presenting with a foreign body in the upper part of the digestive tract.

DISCUSSION

In this long period of time only 0.44 % of upper gastrointestinal endoscopies were done because of ingestion of a foreign body. Seventeen percent of the patients had recurrent impactions.

Rodríguez *et al*. describes three phases in ingestion of foreign bodies. The initial stage shows choking, gagging and paroxysms of coughing, obstruction of the airway. Then the second stage in which the foreign body lodges mostly in the oesophagus. In the third phase complication of the ingestion or further passage along the digestive tract may occur (Rodríguez, H. *et al*., 2012).

Aiolfi *et al*. did a systematic review. The cervical oesophagus appeared to be the most frequent impaction site (67%), while sharp objects were the most common (Aiolfi, A. *Et al*., 2018). They also reported a complication rate of almost 18% related to the impaction or the endoscopic maneuver. The present case-series is in discordance with this review. The majority of obstructions were located in the mid oesophagus or just above the z-line. In addition, the majority was meat or food impaction. Complications of the endoscopic maneuver did not occur.

Anatomically the oesophagus has three narrow segments. The upper and lower oesophageal sphincters and the crossing of the oesophagus with the ascending aorta. Impaction of meat and/or food is the most frequent. Possibly this is because people do not chew enough or swallow to large pieces of meat. Also the impossibility of chewing can lead to swallowing a bolus of food that gets impacted in the oesophagus. Total tooth loss was recorded in 64.29% of patients and 14.29% of patients had partial tooth loss in a study from Mitrovic *et al*.,(2014).

In a study of foreign bodies Geraci *et al*. found oesophageal disorders in almost 9% of cases (Geraci, G. *Et al*., 2016). An analysis of Vicari *et al*. included 189 patients. The structural anomalies seen in the oesophagus were a Schatzki's ring (41%), stricture (32%), and cancer (2%) (Vicari, J. J. *Et al*., 2001).

In the present study this number was in accordance with this last study. In 38% of cases abnormalities in the oesophagus were seen. These were noted during the procedure in which the impaction was seen, a previous endoscopy or during an endoscopy done because of follow-up. In another study from the Netherlands relevant pathology in the oesophagus was seen in 54.5% of cases of food impaction, mostly meat (Baerends, E. P. *Et al*., 2019).

Food impaction can be a first sign of eosinophilic oesophagitis. However, despite the fact that this diagnostic contemplation should lead to biopsy the oesophagus, this is mostly not done in daily practice. In addition, many patients are lost to follow-up (Chang, J. W. *Et al*., 2019).

On the other hand, most patients underwent only one endoscopy, and it can be expected that if there is eosinophilic oesophagitis the patient would have returned with complaints of dysphagia and would have undergone a new endoscopy. As can be seen in patients of group 2 more often biopsy specimens from the oesophagus were taken. But the number in this group with eosinophilic oesophagitis was zero. In group 1 several cases were diagnosed. The most impressive in a young adult almost 21 years after the initial impaction of a coin.

The number of children in all these years was very low. The majority of patients are adults. This is in contradiction with data in the literature. Antoniou *et al*. studied 675 children and detected the foreign bodies in the stomach in 58.1% of cases, the small intestine in 32.7% and the oesophagus in only 9.2%. The majority of ingested foreign bodies passes spontaneously and most children could be safely observed at home (Antoniou, D., & Christopoulos-Geroulanos, G. 2011). The explanation for this discrepancy is a very strict protocol used by pediatricians in cases of ingestion of foreign objects by children. These patients are not sent for endoscopy. Mostly the foreign object passes through the oesophagus. In cases it gets stuck high in the oesophagus the object is removed with the help of the ENT doctor. In all other cases the pediatrician follows a wait and see policy. With the exception of ingestion of potentially dangerous materials. These are removed by the pediatric gastroenterologist in a nearby academic center.

The absolute majority of impacted food or meat could be pushed into the stomach without problems or complications. It provides instant relieve of the complaints. By pushing the problem resolved in 97% of the cases without perforation, aspiration or bleeding (Vicari, J. J. *Et al*., 2001). Cola is an effervescent drink beverage. In a study from the USA 55% of patients responded well to the administration of an effervescent beverage (David, J. *Et al*., 2019). As a first line of treatment Baerends *et al*. also suggest drinking of cola in order to relieve the impaction. This method was successful in almost 60% of cases (Baerends, E. P. *Et al*., 2019).

From the present study it can be concluded that ingestion of foreign bodies, at least in the Zaanstreek region, is a rather rare event. Mostly it is meat or food which can be pushed successfully in to the stomach without complications. People should chew better before swallowing.

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