

GASTROINTESTINAL COMPLICATIONS OF ACCIDENTAL INGESTION OF FOREIGN OBJECTS

J. Huyskens¹, E. Van Hedent², L. Trappeniers², W. Simoens², T. Jager²

Ingestion of foreign objects is common and most of the time, they pass without major problems. However sometimes they could cause significant morbidity or even mortality.

Most of the time they cause pain in the pharyngeal or oesophageal area. In these instants, diagnosing the problem is straightforward, limiting the use of radiographic diagnosis.

However the intraperitoneal complications include stomach or bowel perforation, obstruction, abscedation, septicemia or even hemorrhage or thrombosis of the abdominal veins.

Because of the considerable risks, accompanied by the accidental ingestion of a metallic object, the preferred technique for screening is still Computed Tomography. However not all of these objects are radio-opaque and therefore could not always be diagnosed radiographically.

In this article we will describe several cases of complications, due to the accidental ingestion of foreign objects. Also we will describe certain patient related risk factors significantly increasing, not only the amount, but also the severity of those complications.

Diverticulosis seems the most common risk factor amongst the patients described and so it could be one of the more common triggers causing (recidivating) diverticulitis attacks. But because not all of the ingested foreign objects are radiopaque or still in the gastrointestinal tract, such a theory is difficult to prove.

Key-word: Foreign bodies, in air and food passages.

The ingestion of foreign objects is a common problem in clinical practice. However most of the ingested objects pass through the gastrointestinal tract without any problems within a week (1). Perforation in the gastrointestinal tract is very rare and is only seen in about 1% of the patients ingesting a foreign object (2, 3). Chicken bones and fish bones are amongst the most common accidentally ingested foreign objects and are also the most common cause of bowel perforation. Fish bones are rarely detected radiographically as they aren't always radiopaque, chicken bones however can be detected with computed tomography, when large enough.

Case reports

Case 1

A 67-year-old woman presented at the emergency ward with right abdominal pain of one day duration. On clinical examination she had a fever of 38,4° Celsius and abdominal distress with peritoneal signs. She had a known muscle dystrophia and lupus for which she took several drugs, corticoids being the most important. The laboratory results showed no other than an elevated white blood count and a CRP of 9,51 mg/dl. The decision was made

to perform an abdominal CT scan after admission of intravenous contrast, in the portovenous phase (Fig. 1, 2). This clearly shows a for-

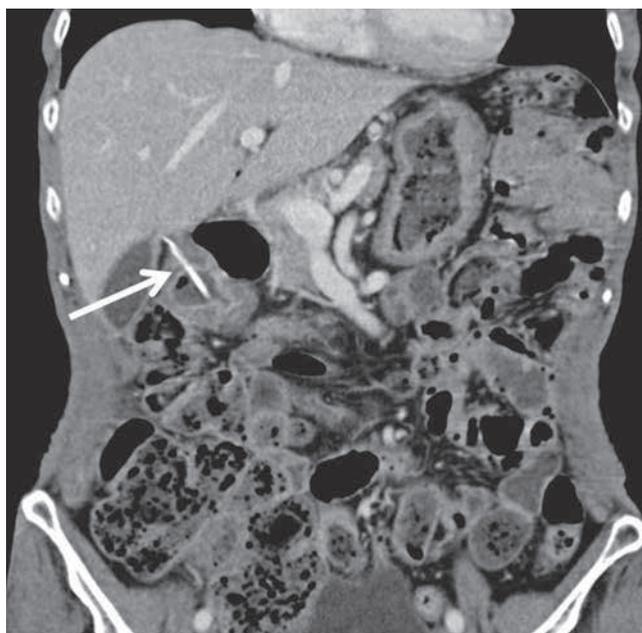


Fig. 1. — CT scan with intravenous contrast in the portovenous phase: coronal reconstruction shows a dense foreign object (arrow) perforating the antral gastric wall. The perforation is covered and gastric wall is thickened and hypodense, suggesting inflammation.

eign object, perforating the antral wall of the stomach, but no free air in the peritoneal cavity. The surgeons performed a medial laparotomy and dissected a pheasant bone of approximately 4 cm in an inflamed area of the stomach. Thereafter an omentoplasty was performed and the patient left the hospital ten days later after treatment with intravenous antibiotics.

From: 1. Department of Radiology, University Hospital Antwerp, Edegem, 2. Department of Radiology, Algemeen Stedelijk Ziekenhuis, Aalst, Belgium.

Address for correspondence: Dr J. Huyskens, Department of Radiology, University Hospital Antwerp, Wilrijkstraat 10, 2650 Edegem, Belgium.
E-mail: jef_huyskens@hotmail.com



Fig. 2. — CT scan with intravenous contrast in the portovenous phase: the axial MIP (maximum intensity projection) reconstruction shows the foreign object (arrow) in close proximity of the liver and biliary ducts.



Fig. 3. — CT scan with intravenous contrast in the portovenous phase: coronal reconstruction shows a foreign object (arrow) in a thickened sigmoid wall.

Case 2

A 79-year old woman was referred by gastroenterologist for a virtual colonoscopy. She already complained of abdominal pain and anal blood loss for several days. She had a known history of recidivating diverticulitis for several years. The virtual colonoscopy was performed after the admission of intravenous contrast and rectal air insufflation in the portovenous phase (Fig. 3, 4). The foreign object lied in the centre of and is the base of the accompanying diverticulitis. This foreign object was simply removed by colonoscopy and identified as a small fish bone. Afterwards the patient was further treated for diverticulitis with antibiotics.

Case 3

A 77-year old man presented at the emergency ward with severe left abdominal pain of two days duration. He is a known COPD patient and already underwent a gastrectomy after several gastric ulcerations. He had no fever, but he did have clear peritoneal signs. Laboratory results showed an elevated white blood count ($16800/\text{mm}^3$) and C-reactive protein (11,53 mg/dl). We performed a CT scan with intravenous contrast in the portovenous phase (Fig. 5, 6).

He was immediately operated on, a laparotomy for partial colectomy was performed. In the dissected colon they retrieved a sharp wooden meat stick. After antibiotic therapy of several days, the patient could return home.



Fig. 4. — CT scan with intravenous contrast in the portovenous phase: axial image shows the foreign object (arrow) in the thickened sigmoid wall with accompanying fatty infiltration as a sign of inflammation. Clearly several sigmoid diverticula are seen on this slide.

Case 4

A 53-year old man presented at the emergency room with malaise, fatigue, night sweats, diffuse pain, arthralgia. The patient had a fever of unknown cause. Clinical examination was negative. Laboratory results showed an elevated C-reactive protein. We performed a CT scan with intravenous contrast in the portovenous phase (Fig. 7, 8). This showed a foreign object that perforated through the stomach with important

perilesional inflammation and thrombosis of main portal vein. Some free air in the hilar region, suggesting some degree of cholangitis. This patient was treated conservatively with antibiotics and therapeutic dosed low molecular weight heparines. After two months, this septic thrombophlebitis of the main portal vein resolved. After conservative management there was a spontaneous evacuation of the foreign object without any residual inflammation.

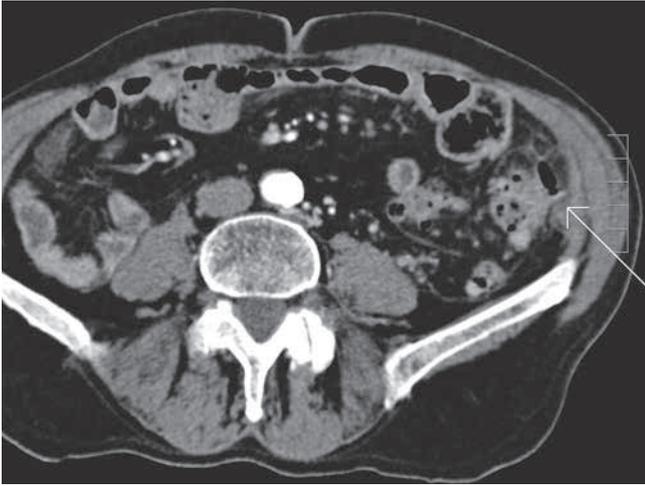


Fig. 5. — CT scan with intravenous contrast in the portovenous phase: axial reconstruction shows a low density foreign object (arrow), perforating the bowel wall of the descending colon. Note the extensive diverticulosis of the sigmoid and descending colon.

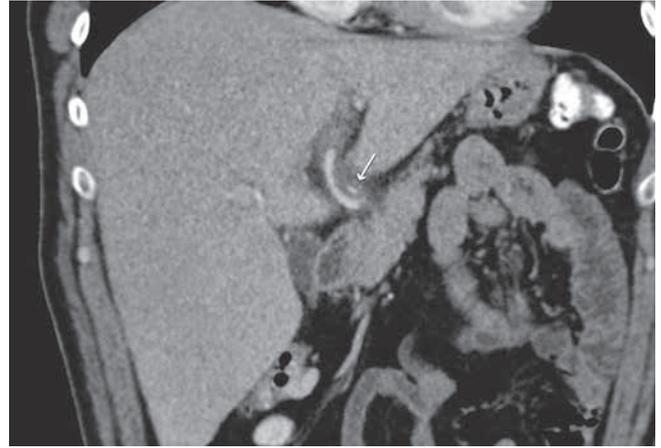


Fig. 7. — CT scan with intravenous contrast in the portovenous phase: coronal reconstruction shows the foreign object (arrow), perforating through the antral wall. Hypodense main portal vein without contrast, suggesting thrombosis.



Fig. 6. — CT scan with intravenous contrast in the portovenous phase: coronal reconstruction shows the low density foreign object (arrow) in the wall of the inflamed wall of the descending colon. Again note the diverticulosis.



Fig. 8. — CT scan with intravenous contrast in the portovenous phase: coronal reconstruction shows the foreign object, perforating through the antral wall with perilesional hypodense tissue, ie inflammation. Free air in the hilar region suggesting cholangitis.

Case 5

A 81-year-old woman was referred to a gastroenterologist by her clinician because she could not sit comfortable for several months. We performed a CT scan with intravenous contrast in the portovenous phase (Fig. 9, 10, 11). This shows a foreign object, perforating the sig-

moidal wall with associated focal diverticulitis of the sigmoid. In first instance, the object could not be removed endoscopically because of the inflammation. After a period of conservative treatment with antibiotics, the object was removed endoscopically. On macroscopical examination the object was identified as a

vanilla stick. After a consecutive treatment of 10 days with antibiotics, the woman remained asymptomatic.

Discussion

A wide variety of offending foreign objects have been reported to result in perforation, including chicken bones, fish bones, metallic objects and toothpicks. Most perforations occur at narrowings or angulations such as ileocecal and rectosigmoid junctions, with approximately 83% occur at the ileum (4-6).

To make the diagnosis, clinical suspicion must be high, because



Fig. 9. — CT scan with intravenous contrast in the portovenous phase: axial image shows a hyperdense foreign object (arrow) in the sigmoid wall. Note multiple diverticula with perilesional focal inflammation, ie diverticulitis.

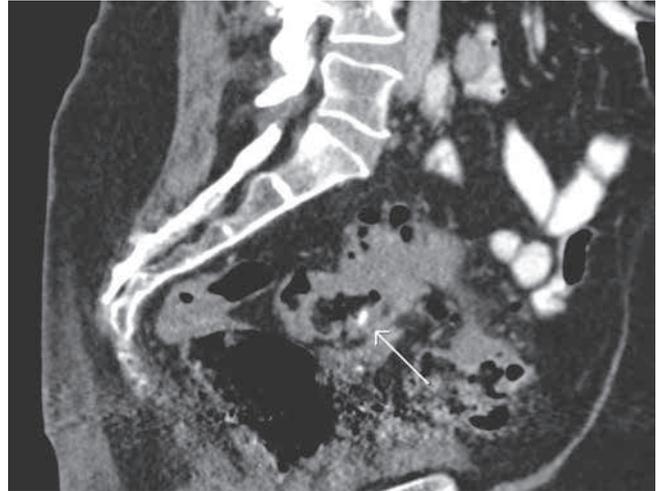


Fig. 11. — CT scan with intravenous contrast in the portovenous phase: sagittal reconstruction clearly shows an area of diverticulitis surrounding a focal hyperdensity, ie the foreign object (arrow).

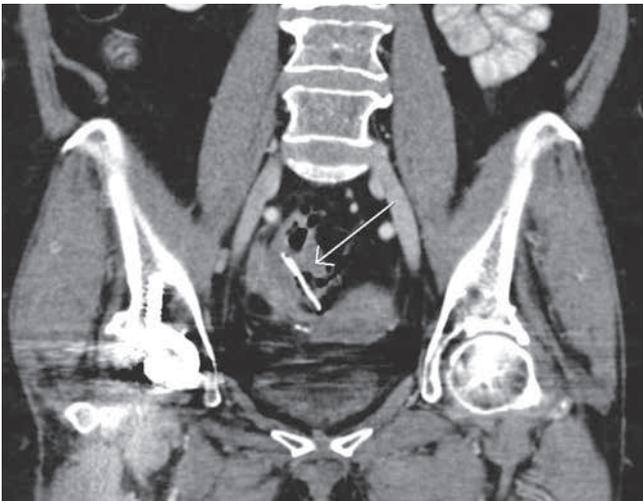


Fig. 10. — CT scan with intravenous contrast in the portovenous phase: coronal reconstruction shows a long hyperdense foreign object (arrow) perforating the sigmoid wall with perilesional inflammation.

many medical conditions can simulate this abnormality. As previously described, colon diverticulitis or unsuspected colon carcinoma can be a secondary finding (7, 8).

Ingestion of foreign objects is more common amongst children, psychiatric patients, elderly patients with dentures, patients with alcohol abuse and the mentally or physically disabled.

As described in the cases above, clinical presentation is variable. Although the gold standard for the treatment of bowel perforation remains surgery or endoscopy, conservative treatment and long-term follow-up can be indicated.

Detection of foreign objects can be challenging. It is easily detected with gross perforation, showing free intraperitoneal gas on radiographs, although this is not seen in the majority of cases. Computed Tomography (CT) is the imaging modality of choice for identifying and localizing the foreign object because of the high spatial resolution, but is still largely dependent on the size and radiodensity of the foreign objects (9). In normal circumstances, metal and wood objects are readily identified on CT but it is slightly more difficult for chicken bones. Fish bones are not always radiopaque and thus are less frequently identified radiographically.

Ultrasound can be very useful, especially in young children, where an ingested object can obstruct the gastric outlet, causing persisting vomiting and dehydration (11). Sometimes a foreign object can be visualized sonographically more distal, for example at the ileocaecal valve. Children tend to ingest plastic or wooden toys, making conventional radiography or CT less useful. Ultrasound is not dependent on the radiographic density and it does not involve ionizing radiation.

As illustrated in three of our cases, perforation of a foreign object was accompanied by the presence of diverticulitis around the site of perforation. Therefore it could be a possible cause of diverticulitis. As diverticulosis is very common, with a prevalence of more than 50% above the age of 60 (10), it is very likely that the ingestion of foreign objects is a trigger for the occurrence of diverticulitis. Before this report, this was not yet described, to our knowledge. Maybe in the future it will be described more, as CT is more widely used for the diagnosis of diverticulitis, as long as we look for it, and also keeping in mind that the foreign object causing the perforation of diverticulum may already passed with the stool.

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