A rare case of perforation of the subhepatic appendix by a toothpick in a patient with intestinal malrotation: laparoscopic approach

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SUMMARY: A rare case of perforation of the subhepatic appendix by a toothpick in a patient with intestinal malrotation: laparoscopic approach.

Background

Acute appendicitis is one of the most common surgical diseases presented by patients in the emergency unit, it affects about 7% of the Western population, the mortality rate is estimated to be around 0.2-0.4% (1). Typical presentation is represented by periumbilical pain radiating to the right lower quadrant of the abdomen with peritoneal reaction on palpation, fever and anorexia. However atypical clinical presentations have been reported such as back pain, pain in the lower quadrants of the abdomen especially in the case of situs inversus (2), pain in the left flank or in the left hypochondrium, in the case of intestinal malrotation (4). Appendicitis results from infection (60%), coprolites (35%), parasites (3%), strictures and tumors (1%) and foreign bodies. Acute appendicitis due to the ingestion of foreign bodies is a rare event, but widely described in the literature. Klinger et al. reported that ingested foreign bodies account for the 0.0005% of the aetiology of acute appendicitis (5). Complications related to the ingestion of foreign bodies are obstruction, perforation, hemorrhage, and fistula. The majority of the ingested foreign bodies pass through the gastrointestinal tract without complications, however, the risk of perforation increases when long and sharp objects, such as toothpicks, are ingested (6). This case report is extremely interesting both for the peculiarity and rarity of the disease and for the therapeutic approach chosen.

Case presentation

A 65-year-old man was admitted under emergency to the Department of Digestive Surgery and Liver Unit, St. M. Hospital, Terni, with a 2 days history of lower abdominal pain and fever.

Physical examination revealed generalized tenderness and rigidity of the abdominal walls especially in the right hypochondrium with torpid peristalsis. Laboratory blood analysis were in the range, including hepatic function; a neutrophilic leukocytosis was present. Abdomen ultrasound revealed the gallbladder and bile duct within limits without gallstones, a subhepatic cecum without
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Direct visualization of the appendix and a thin flap fluid peri-cecal (Blumberg ultrasound positive) was also reported. A computed tomography (CT) scan revealed the anomalous position of the first portion of the large intestine and an inflamed appendix characterized by thickening of the walls of the bowel with involvement of the caecal walls and the ileocecal valve with thickening of the anterior right pararenal fascia (Fig. 1). Patient was diagnosed with subhepatic, retrocecal acute appendicitis. Laparoscopic exploration of the abdominal cavity was performed using minimally invasive technique. After the pneumoperitoneum through needle Veress in the supra-umbilical, three operative trocars were introduced and the peritoneal cavity has explored showing a malrotation of the colon with subhepatic cecum. The last loop was attached to the right paracolic gutter. The cecal wall appeared hyperemic with intense inflammation due to a purulent abscess of the appendix. The blunt dissection revealed the perforation of the appendix caused by the toothpick, infix on the liver which was removed without hepatic damages (Fig. 2). After dissection of the appendicular basis and its section with stapler 45 vascular Endopath, we proceeded to the section and suture of the mesoappendix with the same stapler. Finally, the toothpick has been removed and a wash of the abdominal cavity with saline solution was practiced and after careful haemostasis, a subhepatic Redon drain was placed and ended the procedure with the closure of the mini-incisions. After surgery, the curious discovery was reported and the patient exclaimed "all the fault of that roll!". The postoperative course was fast. On the first day the pain Visual Analog Scale (VAS) score was equal to 3. On the second day the patient is channeled to the gas, resumed independent walking and was given a solid diet. On the third day the bowel was channeled to the feces and on the fourth day the patient was discharged. Only after surgery patient reported an event that can be related with the toothpick ingestion.

Discussion

Accidentally or intentionally, the ingestion of foreign bodies, such as toothpicks, is common in children,
in adults who usually have psychiatric disorders, mental retardation, alcoholism, adults who are in prison or are predisposed due to carelessness, rapid eating, poor eyesight and patients with dental prostheses (7-9).

Foreign body ingestion is not an uncommon problem in clinical practice; however gastrointestinal perforation following the ingestion of a foreign body has been reported to occur in less than 1% of patients, and is usually caused by a material with sharp pointed end (9).

The medical literature reports several articles of gastrointestinal perforation by toothpick ingestion. The review of medical literature revealed several cases of duodenal, jejunal, ileum perforation by toothpick and, to a lesser extent, cecum, colon, sigmoid colon, gastric and esophagus perforation. There are reported lot of cases of aorto-enteric, entero-caval, duodeno-renal fistula (10), perforation of Meckel’s diverticulum (11), perforation of a colon diverticulum (12), pylephlebitis (13), hydropnephrosis (14) due to a toothpick ingested perforating the gastro-intestinal wall. The most frequent consequences of the duodenum and in general of the gastrointestinal tract perforation are liver abscesses from toothpick migration in the liver; in other cases there are reports of abdominal wall abscesses (15) or abdominal abscesses (16). In literature case of perforation of the left colic flexure mimicking renal colic (17), and a case of thigh cellulites (18) and a subcutaneous emphysema of the leg secondary to toothpick ingestion (19) have been reported. Also there is a reported case of right coro-nary perforation due to a toothpick ingested that had penetrated the gastric wall and subsequently migrated into the chest through the diaphragm (20) and a case of constrictive pericarditis due to toothpick that migrated into the pericardium (21). Accidental ingestion of toothpicks may cause symptoms mimicking Crohn’s disease (22), acute appendicitis (23, 24) and renal colic (16).

Although there are several reported cases of intestinal perforation from the toothpick but this case report results to be extremely interesting for two reasons: the patient was a carrier of a rare anatomical variation and that the perforation occurred in the appendix, a phenomenon which cannot be found before in the literature. The anomaly of the appendix position has caused the toothpick to migrate to the liver after penetrating the bowels.

This case appears to be interesting for the diagnostic and therapeutic approach in fact it allows us to highlight the importance of a proper and orderly diagnostic-therapeutic treatment for a patient admitted under urgency. After a careful history and physical examination, any diagnostic doubts must be resolved with further investigations. In our case, the patient reported the presence of abdominal pain in the right hypochondrium, but he had never suffered from biliary colic.

The differential diagnosis among the possible causes of the symptoms under study led to the execution of imaging tests that have thus allowed the identification of the abnormal cecal position and the signs of appendicular inflammation. The appendix is always located at the junction of tenia of the cecum and any change of position of appendix depending on the positions of the cecum (subhepatic, mesocolic, pelvic). Anomalies of rotation and a stop migration of cecum are the basis of the different anatomical locations that can be found and, among these, one of the most common positions in the sub-liver position (5% in adults). Intestinal malrotation is a rare congenital anomaly comprising non-rotation and incomplete rotation of the primitive intestinal tube around the axis of the superior mesenteric artery. In adults the diagnosis is usually incidental, based on investigation carried out for other reasons (25-27).

In the case-report above the diagnosis was made by the radiological examinations that allowed us to identify the disease and to evaluate also the most appropriate surgical approach. It was deemed that a laparoscopic approach, as well as allowing surgical treatment, first of all could allow for an exploration of the abdominal cavity and the definitive diagnosis. The laparoscopic appendectomy, first described by Semm in 1983 (28), appears to have considerable advantages comparing to a conventional appendectomy; this approach reduces tissue damage and therefore reduces the risk of potential postoperative adhesion by reducing intestinal stimulation, determines less hospital stay, less pain, earlier ambulation and oral nutrition, better aesthetic results and less risk of surgical wound infection. Also in case of appendicular perforation, as in the case reported, it enables us to assess any damage to other abdominal organs (29). In our case, the discovery of the toothpick that perforated the appendix and pierced the liver was very surprising. The laparoscopic approach has allowed the easy removal of the foreign body without damage to the hepatic parenchyma, appendectomy and the careful washing of the abdominal cavity, thanks to well-known advantages of minimally invasive techniques, the hospital stay was short with a net clinical improvement and the almost total absence of pain since the first post-operative day (30, 31).

Conclusion

The literature describes several cases of foreign-body appendicitis, however, the case reported appears to be unique because the accidentally ingested toothpick is localized on the appendix in a patient affected by intestinal malrotation with subhepatic cecum. The toothpick occluding the lumen of the appendix caused appendicular inflammation and following perforation of the bowel with consequent migration of the toothpick in the liver. The twofold particularity in this case makes it uni-
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References


