CASE REPORT

A non-occlusive bezoar of caecum in a 7-year-old child: ultrasound detection and multimodality imaging management

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Received: 17 December 2014 / Accepted: 6 March 2015 / Published online: 19 March 2015
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Abstract Bezoars represent the most frequent foreign bodies of gastro-intestinal system, involving first of all the stomach and small intestine; instead the cecum tract is a very uncommon site for bezoars associated with a poor abdominal symptomatology. We report a case of a very rare localization of bezoar in the caecum tract of the ascending colon in a child affected by undefined abdominal pain. In this case, the abdominal Ultrasound examination showed characteristic imaging findings of bezoar completely comparable to that of Computed Tomography, allowing an early diagnosis of bezoar and the possibility of a conservative treatment for the young patient.

Keywords Bezoar · Gastro-intestinal foreign bodies · Ultrasound

Riassunto I bezoar rappresentano i più frequenti corpi estranei del tratto gastro-intestinale, interessando soprattutto lo stomaco ed il piccolo intestino, mentre il cieco

rappresenta una localizzazione molto rara associata ad una scarsa sintomatologia addominale. Riportiamo un raro caso di bezoar localizzato a livello del tratto cecale del colon ascendente, in un bambino affetto da dolore addominale aspecifico. In questo caso, l'esame ecografico dell'addome ha mostrato reperti ultrasonografici caratteristici del bezoar completamente paragonabili a quelli evidenziati in Tomografia Computerizzata, permettendo di giungere ad una diagnosi precoce di bezoar ed alla possibilità di un trattamento conservativo per il giovane paziente.

Abbreviations

CT Computed tomography

Introduction

The term Bezoar derives from the Arabic “badzehr” or from the Persian “panzer”, both meaning counterpoison or antidote [1, 2]. Bezoars are the most frequent foreign bodies of gastro-intestinal system formed because of the ingestion of poorly digestible or indigestible substances [3]. Depending on the content, bezoars can be distinguished in: phytobezoars when contain dietary fibers, trichobezoars if are composed by hairs, lactobezoars due to constant intake of inspissated milk, pharmacobezoars as a result of sustained release medications, lithobezoars made up of ingested stones, etc. [4, 5]. Trichobezoars and lithobezoars are usually demonstrated in children and teens with prevalence for young women with long hair (90 %) [6] and psychiatric predisposition [7]. Phytobezoars are most common in the elderly patients with inadequate food

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intake and chronic constipation. Although they represent a rare cause of all intestinal obstructions (0.4–4 %) [8], the most common gastro-intestinal sites are stomach and small intestine, whereas the colon is rarely involved [9–11].

We present a rare case of bezoar localized in the cecum tract of the ascending colon in a child with an undefined abdominal pain and no sign of bowel obstruction.

Case report

A 7-year-old child was admitted to our Pediatric Hospital with a history of undefined and recurrent abdominal right iliac fossa pain started about a month ago. The young patient did not show any symptom of acute abdomen or bowel obstruction. At the age of 6 months, he accidentally swallowed a cap of bottle which caused the upper airways obstruction and that was manually removed. From that, he became a very anxious child and his dietary was composed only by semisolid meals (milk and biscuits) until the age of 5 years. When he was 7 years old, a more complete diet was introduced with vegetables, meat and fish, avoiding, however, solid meals. At the physical examination, the young patient showed abdominal pain in the right lower quadrant at the abdominal palpation, however without any sign of constipation or peritonitis; in the site of the abdominal pain, a mass was palpable; it seemed solid, ovoid, and movable under the hand pressure. The child, a few days before being admitted to our hospital, had performed a Computed Tomography with intravenous contrast media, but for which the results were not shown. Therefore, at first, a plain radiography of abdomen was performed (Fig. 1). It revealed, better in the lateral–lateral projection,

an intraluminal ovoid mass rounded by a ring of calcifications, with a mottled gas pattern, localized in the ascending colon. There were no signs of bowel obstruction. The successive Ultrasound study showed the typical imaging features of the bezoar with the presence of an intraluminal, hypoechoic and inhomogeneous ovoid mass with linear peripheral calcifications (Fig. 2a, b), which was localized in the caecum tract of the ascending colon, near the appendix (Fig. 2c); the foreign body of the right large bowel resulted movable to the pressure exerted by the ultrasound probe. A non-contrast computed tomography (CT) confirmed the ultrasound features, showing an inhomogeneous hypodense oval, intraluminal mass, with the typical mottled gas pattern and peripheral calcifications; furthermore, its localization at caecum tract of the right large bowel was confirmed (Fig. 3). That was concerning for encapsulated bezoar in the caecum without signs of colon obstruction, thickened intestinal walls as a complication, or suspected tumor. For the localization of the bezoar in the caecum, the young patient was a candidate for the conservative treatment.

Discussion

Bezoars are gastro-intestinal foreign bodies which result from swallowed but incompletely digested foods or vary materials [12]. Bezoars rarely cause gastro-intestinal obstructions, which are the most frequent presentations especially for that located in the stomach and small bowel. Colonic bezoars, instead, because rarely determine bowel obstruction, are uncommonly detected [3]. Bezoars can lead to complications such as acute abdomen syndrome

Fig. 1 A plain Radiography of the abdomen **a** shows, better in the lateral–lateral projection **b**, an ovoid formation, with air bubbles within and rounded by linear radiopacity (*white arrows*). It is localized in the lumen of the right large bowel, without any sign of bowel obstruction. The intestinal foreign body appears less visualized in the anterior–posterior projection, especially for the presence of the contrast medium in the urinary tract resulting from an examination carried out a few days before

Fig. 2 Ultrasound examination of the abdomen, reveals the presence of an ovoid, hypoechoic, intraluminal mass with peripheral calcifications of wall, that is sited in the last tract of the right large bowel (a, b white arrows); more precisely it involves the cecum tract, very near to the appendix which results free of disease (c, white arrowhead). No signs of bowel complications there are. The intraluminal formation results mobile under the pressure of the ultrasound probe

associated with abdominal pain, vomiting, abdominal tenderness or distension, constipation, abdominal palpable mass, or diarrhea, because severe gastro-intestinal obstruction or peritonitis can occur, that have to be promptly diagnosed and treated.

Abdominal X-ray, abdominal Ultrasound examination and Computed Tomography represent the main imaging techniques to diagnose bezoar, especially in children. The typical mottled gas pattern of bezoar is visible in 18 % of patients on plain radiography of the abdomen [8]. The plain radiography can show also the signs of intestinal obstructions whether there are. In literature, barium studies represent another imaging technique to diagnose bezoar showing the characteristic intraluminal filling defect, mobile in the lumen [3]. Ultrasound represents a new, non-invasive, easily performed, imaging technique without use of ionizing radiations. In literature [9, 12] very few works are described about the useful role of Ultrasound in the diagnosis of colonic bezoar especially in children, because it can produce images similar to other pathological

Fig. 3 The Axial non-contrast CT of the abdomen demonstrates the presence of the intraluminal foreign body sited in the cecum tract of the ascending colon, with the typical mottled gas pattern of bezoar characterized by a low density mass associated with gas bubbles within, and calcifications of walls (white arrow)

conditions [9]. Indeed the fecal material in the colon, at Ultrasound, can simulate the image of a bezoar but at CT it corresponds to gas bubbles in particulate matter, arranged in elongated form of greater length and a less compact nature than bezoars [9]. In our case, the Ultrasonography showed the typical pattern of bezoar as an intraluminal oval shaped hypoechoic mass, surrounded by hyperechoic linear surface and marked acoustic shadow. Furthermore, in presence of a colonic mass in a child at the Ultrasound study, an intestinal tumor as a cause could not be excluded. In literature, intestinal malignant tumors in children (40 %) may include adenocarcinoma (11 %), leiomyosarcoma (11 %), lymphoma (9 %), ampullar carcinoma (4 %) [13] and carcinoid tumor (0.19 %) of appendix or ileum [14]. In our case, the Ultrasound images showed non-tumoral features demonstrating an intraluminal mass of colon with well-defined margins, which was movable to the pressure exerted by the ultrasound probe and with no sign of possible intestinal wall infiltration or involvement of the appendix. So, in our case, this imaging technique has allowed to suggest the possible diagnosis of bezoar, characterizing its ultrasonographic features and defining also its bowel location, excluding other possible intestinal diseases. Non-contrast CT of the abdomen proved useful to show the typical mottled gas pattern of bezoar, as a well-circumscribed low-density intraluminal mass containing air bubbles and surrounded by multiple calcifications, the intestinal tracking, the possible signs of abdominal obstruction if there are and others concomitant gastro-intestinal bezoars because it is a multi-panoramic technique. Non-contrast CT of abdomen is considered much more sensitive and specific [15], and may be considered the imaging technique of choice to confirm the diagnosis of gastro-intestinal bezoars and to allow the differential diagnosis with other intestinal diseases.

In conclusion, the Ultrasound represents a very useful imaging tool suggesting the diagnosis of bezoar of colon, especially for that associated with an unspecific symptomatology without signs of obstruction and in pediatric patients, but non-contrast CT is necessary to make a diagnosis more certain of bezoar for quite characteristic images and to reveal others concomitant gastric or intestinal bezoars.

Conflict of interest All authors declare no conflicts of interest, without any financial or personal relationships.

Informed consent The parents of the young patient of our case have signed a written informed consent for all the imaging studies.

Human and animal studies The study described in this article does not contain studies with animal subjects performed by any of the authors. The local ethical committees approved the work which conforms to the institutional and national standards guidelines for the care of human subjects currently applied in our Country.

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