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Review Article

Gastrointestinal bezoars: Review of the literature and report of a rare case of pumpkin seed rectal impaction

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ABSTRACT

In science, bezoar is a mass of hair or undigested vegetable matter, found in a human or animal's intestines, similar to a hairball. Usually, it is found trapped in every part of the gastrointestinal system and must be distinguished by pseudobezoar which is an indigestive object voluntarily introduced into the digestive tract. The term Bezoar is from Arabic bāzahr, “bezoar” or ultimately from Middle Persian pʾtzhl pādzahr, “antidote, bezoar”ægagropile o egagropile It should be a universal antidote that works against any poison, and could neutralize any poison. Otherwise, the name could derive from a kind of Turkish goat whose name is just bezoar. Authors report a case of fecal impaction by pumpkin seeds bezoar with abdominal pain: a difficulty to void with subsequent rectal inflammation and hemorrhoid enlargement was observed. The patient underwent a successful manual disimpaction. Guidelines do not require IRB approval Authors examined the literature about occlusion from bezoar The most common causes of occlusion from bezoar are: a previous gastric surgery such as a gastric band (for weight loss) or gastric bypass, a reduced stomach acid (hypochlorhydria) or decreased stomach size, a delayed gastric emptying, typically due to diabetes, autoimmune disorders, or mixed connective tissue disease. Seed bezoars are usually found in the rectum of patients without predisposing factors, causing constipation and pain. Rectal impaction is common after ingestion of seeds while a true occlusion is rare. Although several cases of phytobezoars composed of various types of seeds are reported in literature, bezoars of pumpkin seeds have rarely been reported.

1. Introduction

Bezoar is a mass of hair or undigested vegetable matter, found in a human or animal's intestines, similar to a hairball. Usually, it is found trapped in every part of the gastrointestinal system and must be distinguished by pseudobezoar which is an indigestive object voluntarily introduced into the digestive tract.[1,2]

In J.K. Rowling's Book of Harry Potter, the apprentice scientist is quizzed on bezoar during the very first Potions Class.[3] Bezoar is a term from Arabic bāzahr, “bezoar” or ultimately from Middle Persian pʾtzhl pādzahr, “antidote, bezoar”ægagropile o egagropile.[4,5] It was believed to have the power of a universal antidote that would work against any poison, and that a drinking glass that contained a bezoar could neutralize any poison poured into it. Otherwise, the name could derive from a kind of Turkish goat whose name is just bezoar.

Bezoar take its name from the core substance so we can distinguish fitobezoar which substance are vegetable fibers and seeds, trichobezoar formed from hair, lactobezoar from inspissated milk, and dyospirobezoar from unripe persimmons.[6,7]

The overall incidence of bezoars is felt to be low and is extremely rare in healthy individuals occurring in far less than 1% of patients in retrospective endoscopic series[7] In 1978, Kadian et al[8] reported that they found six cases of gastric bezoars in a four-year period

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during which time 1400 gastroscopies were done (0.43% of the gastroscopies). Certain groups of at-risk have been identified and include patients with altered upper GI anatomy after surgery and psychiatric illness or cognitive impairment. The most common causes are: a previous gastric surgery such as a gastric band (for weight loss) or gastric bypass, a reduced stomach acid (hypochlorhydria) or decreased stomach size, a delayed gastric emptying, typically due to diabetes, autoimmune disorders, or mixed connective tissue disease. Other causes are patients who can't or don't chew their food properly, usually because they have no teeth or poorly fitting dentures, and an excessive intake of fibers. Edentulous patients with poor mastication of food particles may also be at greater risk for bezoar development, especially if coexisting risk factors as described above are also present. In addition, patients with psychiatric illnesses are at an increased risk for bezoar formation due to possible ingestion of hair and medications[9,10]

Many cases of bezoars have also been reported in children or adults having psychosocial problems nevertheless the condition can occur in normal children with no apparent psychosocial issues[12] Seed bezoar occurs most frequently in the rectum both in children and adults and symptoms are mainly constipation followed by abdominal pain and rectal burning. A true intestinal obstruction is rare and perforation is reported only in one case.[11,12] Fiber bezoar, due to its location in the stomach, causes aspecific symptoms such as nausea, vomiting, and abdominal bloating. Manual evacuation under general anesthesia for rectal bezoar is the treatment of choice to avoid discomfort to the patients while surgery is mandatory in case of intestinal obstruction from small seeds. Manual disimpaction is the most commonly used procedure both in children and adults, while surgery is more frequent in adults than in children (30% vs 14,5%). Chemical dissolution of the mass works better with fibers bezoar than with seeds bezoar: however, Coca-Cola Zero is reported to be effective to break a phytobezoar in small pieces.[13,14] Finally, endoscopy is ineffective because in most cases the endoscope cannot transit beyond the mass. In case of true occlusion, surgery is mandatory even if rare Seed bezoar is a subcategory of phytobezoar caused by the accumulation of indigestible vegetable or fruit seeds in the intestine lumen. They usually pass the stomach and the ileocecal valve and deposit in the colon up to the rectum where the compound is dehydrated and forms a hard bolus impossible to evacuate.[14] Seeds bezoar seem to arise mostly in patients without predisposing factors as a review from Manatakis report[15]: the 12% of cases of previous gastric surgery, neuropsychiatric illness, and endocrinopathies were reported, opposite to fiber bezoar where rates of risk factors exceed 85%.Seed bezoars are usually found in the rectum of patients without predisposing factors, causing constipation and pain Although the literature reported several cases of phytobezoars composed of various types of seeds, bezoars formed of pumpkin seeds have rarely been reported.[16] The diagnosis may be suggested by the radiologic study, and is confirmed by endoscopy. History and digital rectal examination are the mainstays of diagnosis, with manual extraction under local anesthesia being the procedure of choice.[17,18] CT scanning is useful to detect both gastric and small intestinal bezoars. Phytobezoars are visualized by CT scan as a round occupational mass in the gastrointestinal tract. Some cases of bezoars can be coincidentally found in asymptomatic patients by esophagogastroduodenoscopy or computed tomography (CT) scans performed during a health check-up or follow-up of other diseases. We report a case of a man, aged 50 years, with a rectal bezoar composed of pumpkin seeds ingested with their shell necessitating extensive treatment, including manual disimpaction and proctoscopy.

2. Methodology

The description of the case follows the 2013 CARE Checklist Guidelines.[19]

3. Case report

Patient Information: A 50-year-old man, with no significant medical past history, was observed in our outpatient room with a 3-days abdominal pain and difficulty passing anything rectally except some sprays of liquid stool. He complained also of hematochezia at defecation. A physical exam revealed a painful tenderness of the abdomen but the presence of normal bowel sounds. The abdominal wall was mainly painful on the left. He seemed scared and confused in reporting events and was accompanied by his mother He reported having spent the Sunday afternoon alone watching tv and eating two bags of pumpkin seeds (about 400 gr.) with their shell. He was unemployed and showed a depressed attitude. He reported never having had problems of this nature before but to have problems with constipation in the last months.

Diagnostic finding The plain x-ray of the abdomen showed dilatation of the left and bowel A proctological inspection revealed a hard bolus into the rectum (Fig. 1) with blood loss and a rectoscope examination showed a pumpkin bezoar impacted into the rectum (Fig. 3). Starting from the history and results of the proctological inspection, the diagnosis of impaction from seeds was quite clear (see Fig. 2).

Therapeutic intervention Under sedation with propofol, a

Fig. 1. Bezoar's lump manually extracted.

Fig. 2. Endoscopic view of the mucosa after disimpaction.

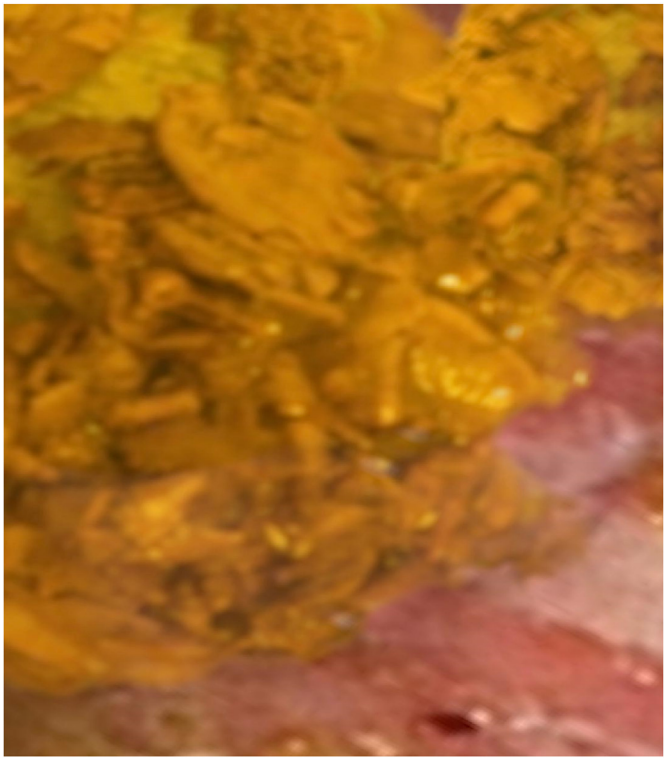

Fig. 3. Endoscopic view of bezoar inside the rectum.

disimpaction of the bezoar was performed and accomplished with a washing of the colon. The patient was discharged in the same evening with a prescription of intestinal antibiotics and large bowel toilet by polyethylene glycol and enemas.

Outcomes: Two days after the first admission the patient returned to the outpatient department complaining for persistent difficulty voiding with a burning sensation and blood loss. A residual hard bolus, smaller than the first, was detected in the rectum, and another disimpaction under local anesthesia was performed. A proctoscopy showed small diffuse ulcerations of the rectal mucosa and enlargement of hemorrhoids. The colon was empty at the end of the procedure A topical daily application of sucralfate enemas, stool softeners, and fibers diet was prescript and the patient passed normal stools without pain on the following day. A suggestion of psychological help was made.

Follow-up Three weeks after this episode the rectal mucosa reverted to normal and the patient declared to move regularly without a burning sensation.

4. Discussion

Rectal seed bezoar is an uncommon cause of fecal impaction, more frequent in eastern than western countries and particularly in Middle Eastern and South Asian countries where roasted seeds are very popular.[20,21] The composition of a bezoar is essentially mechanical, due to its insoluble and indigestible content. The growth is increased by continuous ingestion of non-degradable content. The most frequent site is the stomach and rarely it can be observed in the colon and rectum. Clinical symptoms include nausea, vomiting, anorexia, constipation and obstipation. Rectal ulcerations are not frequent even if the first report of a stercoral ulceration was described by Berry in 1894: an isolated ulcer produced by pressure necrosis of a fecal mass in the rectum.[22] In 1987, Ahn et al[23] reported a similar incidence of 0.43% (14/3247 esophagogastroduodenoscopy examinations) over a seven-year period. More recently, Mihai et al[18] noted that there were 49 cases of gastric bezoars over a period of 20 years (0.068% of all endoscopies). Yakan et al[24] reviewed 432 cases of small bowel obstruction treated within 10 years; of these, 14 (3.2%) cases were caused by phytobezoars. Multiple cases of persimmon phytobezoar (diospyrobezoar) have been reported in regions where the residents frequently consume fresh persimmon fruits and dried persimmons, such as South Korea, Japan, Israel, Spain, Turkey, and Southeastern United States. In a meta-analysis by Ghosheh et al[25] reviewing 19 reported studies published from 1994 to 2005, laparoscopy was attempted in 1061 patients presenting with acute small bowel obstruction, and bezoars represented the 5th most common cause, accounting for 0.8%

From 1980 to 2018 fifty-two studies were reported by Manatakis[15] responding to eligibility criteria over a total of 102 papers published. From 2018 up today another 8 papers with a full text available were published. In four out eight bezoar formation was from seeds (granadilla, mango, and sunflowers 2 cases) but none of the patients ate pumpkin seeds.[26,27] Were also reported two cases of subclinical CD diagnosed after fruit pit ingestion, causing bowel obstruction; additionally, we conducted a narrative review of the scientific literature on cases of intestinal obstruction secondary to impacted bezoars due to fruit pits.[28] This report corroborates the concept that CD patients are at a greater risk of bowel obstruction with bezoars generally and shows that accidental ingestion of fruit pits may lead to an unusual presentation of the disease. Therapeutic options in this group of patients differ from the usual approaches implemented in other patients with strictures secondary to CD.[29]

Khat chewing which is widely practiced in eastern African and Middle East countries might contribute directly or indirectly to bezoar formation. It has chemicals known to decrease bowel motility thereby, possibly leading to concretion of proximal gastrointestinal content.[30]

The case of a phytobezoar that was formed at a knot on the

pigtail-shaped J-tube and developed only in association with postprandial abdominal pain, similar to a feeling of a tube being pulled in without an exacerbation of Parkinson Disease symptoms. Such abdominal pain may be a warning sign of phytobezoar in LCIG-treated patients. Despite device-related complications, high-pressure alarms are not always present, and PD symptoms are not always exacerbated[31]

Rapunzel syndrome is the formation of a trichobezoar that extends beyond the small intestine. Since its discovery few cases have been reported in the literature with variable clinical characteristics, causing important complications such as intestinal obstruction. Laparotomy is currently considered the treatment of choice.[32]

Trichobezoars are rare, but most commonly found in young women with trichophagia and trichotillomania. Complications can include iron deficiency anaemia and gastric erosion or, rarely, perforation. A 19-year-old woman presented with epigastric pain, vomiting and lethargy. Initial investigations revealed a palpable abdominal fullness on examination and iron deficiency anaemia. Oesophagogastroduodenoscopy found a large trichobezoar associated with gastric erosions, polyps and an ulcer. Subsequently, the patient reported previous consumption of artificial hair extensions, which ceased 5 years previously[33] Enteral nutrition in intensive care has been a great advance in medicine, due to its benefit, cost-effectiveness and few complications. Bronchoaspiration, diarrhea, regurgitation or mechanical problems are the main adverse effects. Esophageal obstruction by bezoar is a very infrequent complication, and there are only a few cases described in the literature.[34]

According to Manatakis[15] the major complaint was constipation followed by atypical abdominal or rectal pain. One elderly patient was diagnosed with acute abdomen due to rectal perforation, and one incident intraoperative finding was reported.

Preventive therapy to avoid recurrence must be implemented when the bezoar is removed. The patient should be advised to increase the amount of water intake. Dietary habits must be investigated since inadequate chewing, swallowing whole seeds, or eating seeds with their shell may lead to impact as bezoar.[11–23]

Finally gastric bezoars are reported as common in cystic fibrosis patients after lung transplantation. The etiology is likely multifactorial, related to gastric motility, respiratory secretions, and medications.: of the 215 patients who received lung transplantation, 17 (7.9%) developed gastric bezoars confirmed by upper endoscopy and 94% of patients with bezoars (16 of 17) had cystic fibrosis ($P = 0.02$), Further investigation is needed to understand the pathogenesis of bezoar formation in this selected population[35]

5. Final considerations

Seed bezoar is an uncommon cause of fecal impaction, more frequent in eastern than western countries and particularly in Middle Eastern and South Asian countries. Surgical treatment can be avoided if the impaction is in the lower tract where endoscopy and manual disimpaction can be helpful. Manual disimpaction is the commonly used procedure both in children and adults, while surgery is more frequent in adults than in children in case of bowel occlusion. Preventive therapy to avoid recurrence must be implemented when the bezoar is removed. Patients must be advised to increase the amount of water intake. Moreover psychiatric support is mandatory in patients with recurrent episodes of seeds ingestion. Personalised coaching solutions enable patients to prevent and avoid unhealthy eating habits and lifestyle. It is increasingly being offered through mobile applications, which allow patients to receive advice on nutrition and other lifestyles (such as foods to avoid, smoking, alcohol, drug abuse) in line with personal preferences. Interactive coaching allows to monitor patients' behaviour in order to identify possible warnings to be communicated to users.[36]

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Compliance with ethical standards

Authors declare to have no disclosures or potential conflict of interests.

Authors declare that the paper doesn't concern any research on human or animal.

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

The publication of this article is exempt from ethnical approval in our institution.

Contribution

MAURIZIO GENTILE: surgical experience general organization writing paper, GIOVANNI CESTARO: collecting data, NUNZIO VELOTTI: references and wring paper, STEFANIA SIVERO: critical review, Maddalena Illario: supervision, Vincenzo De Luca : file organization, Mario Musella : critical treview.

Appendix A. Supplementary data

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