ISSN: 0000-0000
Published 00 11 0000

Shiitake Mushroom As A Cause Of Bowel Obsruction

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ORIGINAL

Abstract

Shiitake mushrooms have been used in traditional Chinese medicine to prevent and treat several ailments for centuries. Dried mushrooms are a popular ingredient in East Asian cuisine. Due to its high insoluble fiber content, the undigested mushroom can act as a bezoar, and cause small bowel obstruction. Bezoar-associated small bowel obstruction is rare and is usually found in patients with a history of gastrointestinal surgery. We present a case of small bowel obstruction due to mushroom bezoar in an elderly patient. Laparotomy and enterotomy were performed and a whole piece of undigested shiitake mushroom obstruction the terminal ileum was extracted successfully.

Introduction

Most of the small-bowel obstructions are due to adhesions caused by a previous abdominal surgery (1). Other causes include hernias, intussusceptions, tumors, and gallstone ileus. Bezoar-induced small bowel obstructions are rare and reported to account for about 4% of all small bowel obstructions (2). Phytobezoars are the most frequently observed type of bezoars, and they consist of poorly digested fruit and vegetable fibers. Mushroom bezoar is a rare cause of small bowel obstruction (3). There are no specific clinical features indicative of mushroom-induced small bowel obstruction and diagnosis is often made at surgery. Delay in diagnosis can result in a fatal outcome. Clinical awareness of the condition and a low threshold for using abdominal computed tomography (CT) is essential for prompt diagnosis and treatment. We report a case of small bowel obstruction caused by shiitake mushroom requiring surgical intervention.

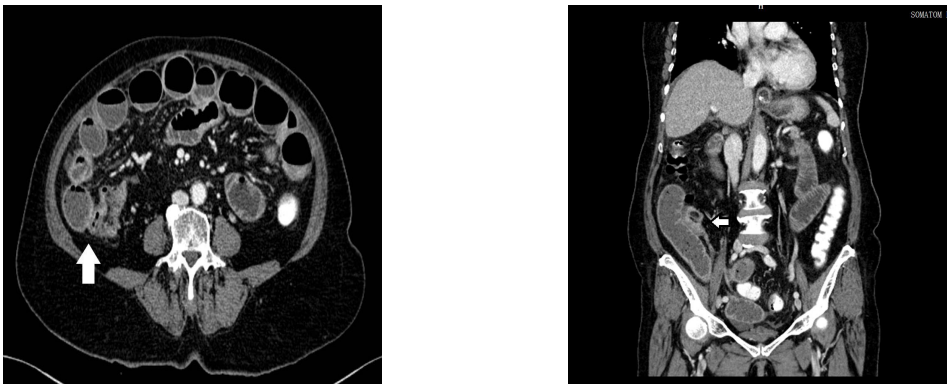
Case Report

A 73-year-old woman with a history of diabetes mellitus and hypertension, presented with progressively worsening abdominal pain and distension over four days. She also experienced nausea, vomiting, and constipation. There was no history of altered bowel habits or surgery in the past. There was no history of similar complaints in the past and the patient has been relatively well. On examination, she did not appear distressed, and her vital signs were stable. The abdomen was distended but otherwise soft, and no mass was felt. Findings per rectal examination were insignificant. Her blood investigations revealed a white blood count of 12.8x103/µL, Hemoglobin 11.6 g/dl, platelet count of 300 x103/µL, Urea was 13.9 mmol/L and serum creatinine was 129 mol/L. Blood gas shows metabolic alkalosis (pH 7.51, HCO3 27.9, Base excess 4.8). An erect abdominal x-ray demonstrated dilated small bowel. A contrast-enhanced computed tomography of the abdomen revealed obstruction of the distal small bowel due to a suspicious mass. The patient was resuscitated and subjected to an urgent laparotomy.

Intraoperatively, the small bowel was dilated, and an obstructing intraluminal mass was noted in the ileum just proximal to the ileocecal junction Figure 2. There is no bowel ischemia or

OPEN ACCESS
Edited by
A.Hussain
Submitted *30 Nov 2021*
Accepted *04 Dec 2021*
Citation
Felicia Kong, Subhathira Manohkaran, Kandasami Palayan. ShiitakeMushroomAsACauseOfBowel Obsruction: BJOSS::2021:(1);35-38

perforation at the site of the mass. The mass was soft in consistency but fairly impacted in the lumen of the bowel. A diagnosis of intestinal obstruction secondary to bezoar was made and an enterotomy was performed Figure 3. A whole piece of undigested mushroom was found impacting the lumen of the terminal ileum, and it was extracted successfully. The enterotomy was closed primarily. Post-operative recovery was uneventful, and the patient was discharged on the fourth post-operation.



(a) (b)

Figure 1. shows CT abdomen (axial and coronal view). Arrow indicates the suspicious mass at the distal ileum with dilatation of the small bowel. There is an abrupt transition at the narrowed of terminal ileum due to obstruction in the small bowel.

Figure 2. Intraluminal mass at the terminal ileum with the transition zone

Figure 3. Whole piece of undigested shiitake mushroom (4cm x 3cm x 3cm) extracted through enterotomy

Discussion

Bezoars are aggregations of indigestible material that are usually formed in the stomach and occasionally in the small intestine. Shiitake mushroom-related bezoar obstruction of the small intestine is a rare occurrence (3). Shiitake mushroom is an important part of Asian cuisine and is cherished as a healthy food with beneficial effects for health and treatment of diseases including cancers (4). Mushrooms have gained increasing popularity and are being touted as a superfood and are found in many different forms from powders to dried, fresh, or preserved format grocery stores. The shiitake mushroom is full of dietary fiber and in the dried form it contains 49.1% is dietary fiber and 82.9% of which is insoluble fibre (5). Dietary fiber is an important factor in diet. It reduces the intestinal transit time of the food and increases fecal mass, which facilitates defecation and prevents constipation. Given that mushrooms are rich in fiber when consumed in uncut form, or large portions, the undigested fiber can act as a bezoar and may cause small bowel obstruction. Previous gastric operations, difficulties associated with mastication, excessive indulgence of foods with high fiber contents are common factors that are known to be associated with bezoar-induced intestinal obstruction. The most common site for impaction in patients without previous surgery is the terminal ileum, which correlates with the anatomical narrowest part of the small bowel. Our patient did not have any previous surgery or gastrointestinal problems in the past. However, she had poor dentition and the shiitake mushroom being fibrous, soft, and slippery was probably swallowed without being properly chewed.

The clinical manifestation of bezoar-induced intestinal obstruction is variable, depending on the site of impaction. The most common clinical features include abdominal pain, bloating, nausea and vomiting. The diagnosis can be challenging because the manifestations are not easily distinguished from other causes of small bowel obstruction (6). The diagnosis of small bowel obstruction must be made accurately, that the site and cause of obstruction are determined before treatment strategies are formulated. While most patients with adhesive small bowel obstruction resolve spontaneously, delay in prompt management of bezoar-related small bowel obstruction may result in bowel ischemia and fatal outcome. The diagnosis of small bowel obstruction is based on a comprehensive approach that includes gathering clinical information, laboratory tests, and radiological images. Although plain radiograph reveals a classical obstructive pattern of the bowel, it fails to offer a clue to the etiology. Computerized tomographic scans of the abdomen have become the preferred examination for the evaluation of small bowel obstruction as they can provide valuable information on the cause of the obstruction (7). In addition, CT scans can help detect signs of concomitant intestinal ischemia. The radiological features of small bowel bezoar are typically described as intraluminal ovoid or rounded mottled-appearing mass, containing air bubbles (8). With technological advances, endoscopic removal of bezoars has become an option for the diagnosis and treatment of bezoars (9). However, the most reported endoscopic approach has been limited to bezoars in the stomach and proximal small bowel.

Surgery is the standard treatment for small bowel obstruction due to bezoar (10). Generally, the bezoar is impacted in the narrowest segment of the small bowel, which is at the terminal ileum, just proximal to the ileocecal valve. At laparotomy, the entire length of the small and large bowel must be examined thoroughly, and an enterotomy is performed to extract the bezoar. Fragmentation and milking may be attempted if there is no evidence of bowel ischemia and the bezoar is relatively soft and small. If fragmentation is attempted, it is important to ensure that the entire bezoar is expelled to the large bowel and the integrity of the small bowel is preserved. Segmental bowel resection and anastomosis may be required in presence of ischemia of the bowel. While open laparotomy is widely considered the treatment of choice for small bowel obstruction, the laparoscopic approach has in recent years gained increasing acceptance as a treatment option (11) compared to open surgery, laparoscopy facilitates the earlier resumption of diet and shorter hospital stay. Where feasible, laparoscopic extramural fragmentation of the bezoar can be performed using atraumatic forceps and the bezoar can be milked into the caecum. In our patient, uncertainties in the pathology and the extensive dilated intestinal loops made us elect for open laparotomy rather than a laparoscopic approach.

Conclusion

With the growing numbers of health-conscious consumers, shiitake mushrooms have become an important source of dietary fiber. There must be a high index of suspicion bezoar induced small bowel obstruction, especially in elderly patients with poor dentition. CT scans should be the preferred imaging modality for early and accurate diagnosis. Surgical intervention should remain as the mainstay of treatment for bezoar-induced small bowel obstruction.

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