



Significance of Bottle Gourd sign on computed tomography in patients with abdominal cocoon: a case series

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Abstract

Abdominal cocoon is an uncommon entity manifesting as abdominal pain, lump and features of intestinal obstruction. The diagnosis is established by demonstrating a membranous sac covering the small bowel loops which can be seen at the time of surgery or demonstrated by imaging studies like computed tomography (CT) or magnetic resonance imaging. CT has been reported to be of utility in making a preoperative diagnosis. The features may include clumped bowel loops, loculated fluid, cauliflower sign or concertina arrangement of bowel loops. We report on three cases of abdominal cocoon who presented with intestinal obstruction due to three varied etiologies (idiopathic, tuberculosis, malignancy). We also describe a radiological sign, the bottle gourd sign, in these three cases. The sign possibly suggests jejunal obstruction due to formation of abdominal cocoon.

Keywords: abdominal cocoon, tuberculosis, surgery, computed tomography

Introduction

Abdominal cocoon is an uncommon clinical entity which is characterized by formation of a fibrous membrane around the small bowel loops. It may also involve the large intestine or other visceral organs and is then labeled as complete abdominal cocoon. Abdominal cocoon usually presents with abdominal pain and features of intestinal obstruction and may occur in the setting of chronic ambulatory peritoneal dialysis, tuberculosis, drugs etc., or may be idiopathic [1,2]. The diagnosis is usually established at the time of surgery. Surgery is helpful not only in the diagnosis but also in the management as adhesiolysis and the resection of bowel may relieve the clinical symptoms. Recent reports have indicated that computed tomography (CT) and/or magnetic resonance imaging (MRI) may help in establishing a pre-operative diagnosis [2]. Various features described on imaging of abdominal cocoon include small bowel faeces sign, clumped loops, membrane around bowel loops, loculated ascites, cauliflower sign and concertina arrangement of bowel loops [1-4]. We describe an interesting clinical sign similar in appearance to “bottle gourd” in three patients with abdominal cocoon related intestinal obstruction.

Case series

Case 1

A 51-year-old male presented with a history of colicky abdominal pain and recurrent episodes of intestinal obstruction for three months. The patient had been admitted elsewhere and had been managed conservatively by keeping nil per oral and on nasogastric aspiration. He presented to us with another episode of intestinal obstruction and the abdominal roentgenogram revealed multiple air fluid levels. He had no history of any chronic disease and was not on any medication. His Mantoux test was negative and he had no family history of tuberculosis. Computed tomography for evaluation of intestinal obstruction showed dilated stomach and duodenal loops with clumping of jejunal loops and membrane formation suggesting abdominal cocoon (Figure 1A). We noted a finding of dilated duodenal loops with a cut off at the duodeno-jejunal junction appearing like a bottle gourd (Figure 1C). This patient also had evidence of cauliflower sign on computed tomography. The patients underwent surgery which confirmed the presence of idiopathic abdominal cocoon (Figure 1C) and adhesiolysis with release of bowel loops was undertaken. The patient improved after surgery and was discharged on the

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fifth post-operative day. The patient is doing well at 3 months of follow-up and gained 5 kg body weight.

Case 2

A 40-year-old woman presented with recurrent episodes of abdominal pain for 2 months. These were punctuated with episodes of severe abdominal pain associated with bilious vomiting and abdominal distension. She was admitted for an episode of intestinal obstruction. She denied any history of other chronic diseases or intake of any medication. She had a positive Mantoux skin test, pulmonary involvement in form of pleural effusion. She had a low serum ascites albumin gradient (SAAG) of 0.6 and low adenosine deaminase value (10.3). Abdominal CT revealed clumping of loops with membrane formation suggestive of cocoon and the “bottle-gourd sign was also seen (Figure 2). The patient was managed conservatively with nil per oral, i.v. antibiotics and fluids, and nasogastric aspiration. The patient improved with conservative treatment and was started on anti-tubercular therapy on the basis of the presence of pleural effusion which revealed high adenosine deaminase (ADA: 80 IU/L). However, she

later developed antitubercular therapy (ATT) related liver failure and unfortunately died due to complications related to ATT induced liver failure in form of coagulopathy, encephalopathy and sepsis.

Case 3

A 70-year-old male developed intestinal obstruction and presented to us with severe abdominal pain and distension. He also complained of significant loss of weight (15 kg in last 6 months) and loss of appetite. He was a diabetic with no history of any other chronic illness. He was on metformin and his glycosylated haemoglobin was 7.1. On examination, the patient was noted to have umbilical nodule and abdominal lump. Computed tomography of the abdomen revealed the presence of an abdominal cocoon. The computed tomography revealed membrane around the small bowel loops and scalloping of the liver with omental deposits. Computed tomography also revealed “bottle-gourd” sign. (Figure 3). The cytology from the ascitic fluid showed malignant cells and the patient was given the option of surgery to relieve the obstruction. However, the patient refused further care and left against medical advice.



1B



Figure 1. (A) CT showing cocoon and Bottle Gourd sign (B) Bottle gourd and (C) Surgical findings showing membrane around the small bowel loops.

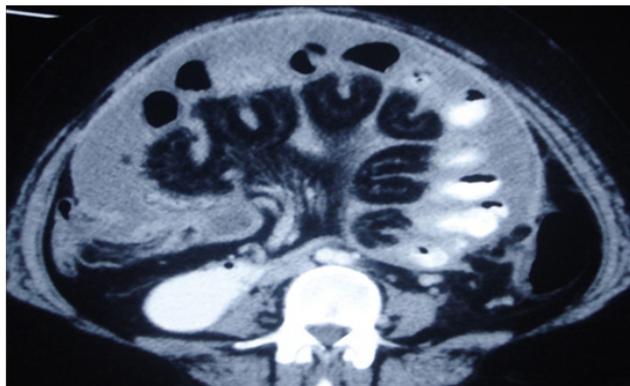


Figure 2. Bottle gourd sign in a patient with abdominal cocoon with fluid around the small bowel loops.

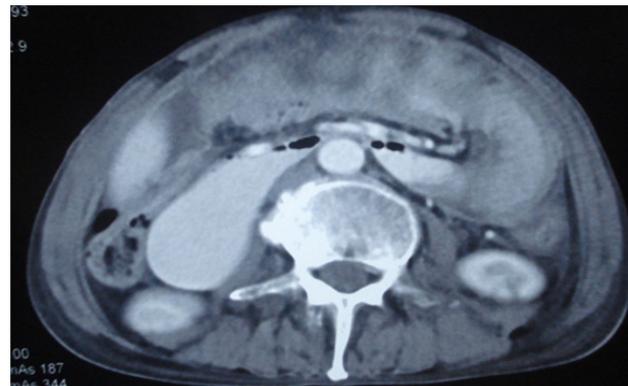


Figure 3. Bottle gourd sign (dilated duodenal loops) with entrapped jejunal loops in a membranous cocoon.

Discussion

Abdominal cocoon, also known as encapsulating peritoneal sclerosis or sclerosing encapsulating peritonitis, is a rare clinical entity which may occur in a number of diverse clinical settings [1]. The diagnosis was often established on surgery but recently imaging modalities like CT or magnetic resonance imaging (MRI) have been reported to be of use in pre-operative diagnosis. The findings on computed tomography may include demonstration of the membrane or clumped loops surrounded by a membrane (appearing like a cauliflower) or a concertina pattern of the arrangement of bowel loops. Pre-operative diagnosis may help avoid surgery as some of the patients can be managed with conservative therapy [2]. Since the clinical presentation is often with abdominal pain and intestinal obstruction, the differential diagnosis includes any condition which can cause intestinal obstruction like intestinal strictures, intestinal masses, intestinal tuberculosis, peritoneal mesothelioma, peritoneal carcinomatosis and peritoneal encapsulation [1]. The patients with abdominal cocoon need to be evaluated for possible underlying etiological factors including peritoneal dialysis associated cocoon, tubercular abdominal cocoon, drug related, post-operative, or idiopathic [1,3,5].

We, hereby, report an interesting radiological finding which we noted in these three patients. The bottle gourd sign is a result of contrast filled dilated duodenum due to obstruction of the jejunal loops. We believe that this appearance is related to the fact that part of the duodenum is a retroperitoneal structure and the jejunum being an intra-

peritoneal structure is the first part which is involved inside the membrane of the cocoon resulting in proximal dilatation. We also feel that the finding may occur in patients with involvement of the proximal jejunum by the membrane and in patients who have intestinal obstruction, because such a prominent dilatation is unlikely to occur in the absence of intestinal obstruction. The sign is unlikely to be specific for abdominal cocoon as it could occur in any cause of jejunal obstruction. But, if present, it suggests jejunal involvement by cocoon and presence of jejunal obstruction leading to duodenal dilatation. We could not demonstrate this finding in two other patients with abdominal cocoon in whom CT was performed in the absence of intestinal obstruction.

To conclude, “bottle gourd” sign may be demonstrated in patients with abdominal cocoon who have jejunal obstruction.

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