

Ingestion of a foreign body unmasks an asymptomatic small bowel carcinoid tumor

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Abstract

Bowel obstruction is a common surgical admission around the world. On the other hand, small intestinal tumors, such as midgut carcinoid, are uncommon neoplasms and an infrequent cause of intestinal obstruction leading to hospitalization. A foreign body is an extremely rare cause of intestinal obstruction and when ingested, foreign bodies most often lodge in the narrowest portion of the gastrointestinal tract. Narrowing of the small bowel due to a neoplasm can prohibit the passage of an accidentally ingested foreign object and produce an obstruction that neither the neoplasm nor the foreign body could have produced alone. We hereby report a case in which an accidentally ingested piece of foreign material leads to the finding of a small, early stage, asymptomatic, midgut carcinoid cancer in the proximal ileum that would have otherwise eluded detection for several years.

Introduction

Bowel obstruction is a common surgical admission around the world usually resulting from post surgical adhesions or abdominal hernias. Conversely, small intestinal tumors, such as midgut carcinoids, are uncommon neoplasms and an infrequent cause of intestinal obstruction. Although the small bowel is the most common site for these tumors, the overall incidence is still less than two per 100,000 of all medical or surgical admissions, however the actual reported incidence is closer to eight per 100,000 based on autopsy studies.^{1,2} A preexisting small bowel neoplasm can prohibit the passage of an accidentally ingested foreign object and produce an obstruction that neither the neoplasm nor the foreign body could have produced alone. We hereby report an interesting case in which a small piece of foreign material accidentally ingested by a patient lead to the detection of an asymptomatic midgut carcinoid in the proximal ileum that would have otherwise eluded detection for several years.

Case Report

A previously healthy, 39-year-old male presented to the emergency department (ED) with a less than 24 hour complaint of severe cramping abdominal pain and two episodes of emesis within the past five hours. He denied history of abdominal surgery, recent travel or changes in bowel habits. His past medical history is significant only for hypertension for which he was noncompliant and not taking any medication. Social history was relevant for cigarette smoking of one pack per day and for beer drinking several times per week but he denied ever being intoxicated. His last drinking event was a couple of cans of beer two days prior to his presentation. Review of systems was negative except for the gastrointestinal complaint resulting in his emergency room (ER) visit. The patient was employed as a mechanic and had previously been active until the onset of his current symptoms.

At presentation, his pulse was 98 beats/min, his blood pressure was 186/88 and his temperature was 99.0 degrees Fahrenheit. Respiration rate was 16 times per minute and unlabored. Physical exam revealed a moderately obese Caucasian male in obvious discomfort. His chest was clear to auscultation, heart sounds were regular and without murmur, and he had no peripheral edema or cyanosis. The abdomen was mildly distended. The bowel sounds were hyperactive with some rushes, but not high-pitched. His bowel was diffusely tender to deep palpation, without focal tenderness; and no ventral or inguinal hernias were found. The patient displayed mild voluntary guarding however; there were no obvious rebound or other peritoneal signs.

His laboratory analysis was remarkable only for a white blood count of 19.8×10^3 with left shift (28% bands). His chemistry panel was abnormal for a hypokalemia of 3.3 gm/dL.

Plain films of the abdomen showed dilated small bowel loops with multiple air fluid levels, highly characteristic of a distal small bowel obstruction. A computed tomography (CT) scan of the abdomen with IV and PO contrast revealed dilated, contrast-filled, small bowel loops, a short segment of small bowel with thickened bowel wall, and a small metallic ring within the lumen (Figure 1). The colon was collapsed and mesenteric adenopathy was noted (Figure 2).

The patient was resuscitated with 2 liters of intravenous Lactated Ringer's and then taken to the operating room (OR) for an exploratory laparotomy. Upon entering the abdomen, dilated loops of small bowel were immediately encountered that had a tapioca-like studding pattern, particularly around the proximal jejunum. An obvious stricture was noted in the distal jejunum/proximal ileum which displayed

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the characteristics of a transition point in which the distal bowel segment was decompressed, and the proximal segment was dilated and edematous. Palpation revealed a patchy, white, firm, napkin-ring-like deformity in the bowel wall with thickening and contracture of the surrounding mesentery (Figure 3). A foreign body could be palpated within the lumen. Within the adjacent mesentery, a hard, sub-centimeter nodule with surrounding desmoplastic reaction was visualized, this was consistent with a metastatic mesenteric lymph node. Several other lymph nodes were firm and easily palpable or visible within the remainder of the small bowel mesentery. Running the entire length of the bowel revealed two more palpable subserosal masses within the jejunum/ileum just distal to this site, each measuring less than one centimeter. A segmental *en bloc* small bowel resection to include all three lesions and the mesentery was performed. The total resected small bowel measured 29 cm in length. The adjacent remaining mesentery was then carefully explored and dissected for any additional metastatic lymph nodes, three were identified and removed. A cholecystectomy was also performed without difficulty.

The specimen was immediately dissected in the pathology lab (Figure 4). Upon opening the bowel wall a dense, intraluminal mass, with an associated tight luminal obstruction was noted. Additionally, a tab from a beer can was seen immediately proximal to the intraluminal mass (Figure 5). This mass displayed the classic scirrhous desmoplastic reaction associated

with carcinoid cancer.

The final pathology revealed a multifocal, low-grade neuroendocrine tumor (carcinoid) with multiple drop metastases throughout the segment of intestine and metastatic mesenteric lymph nodes. Two of the three additional lymph nodes submitted were positive for metastasis. Both the intraluminal mass and lymph nodes stained positive for chromogranin and synaptophysin, but were negative for Ki-67.

The patient's recovery was uneventful with the return of normal bowel function on the fourth postoperative day. He was discharged home on the fifth postoperative day.

Upon questioning at a postoperative visit, the patient recalled that two days prior to his admission he had dropped a beer tab into the beer can that he was drinking and he must have swallowed it without knowing. His 24 hour urine was collected and submitted for analysis of 5-HIAA levels, this was within normal limits.

Discussion

Carcinoids are rare neoplasms, first reported by Langhans in 1867 and first described by Lubarsch in 1888.³ The term carcinoid (*karzi-noide*, meaning cancer-like in German) was originally given by Oberndorfer to this tumor for its' histological malignant appearance, but *benign* and indolent clinical course when compared to that of other cancers.⁴

Patients with midgut carcinoid commonly present with vague and non-specific symptoms, which often results in clinical detection being delayed for years. As time progresses, the most common presenting symptom is intense, episodic, abdominal pain, which is typically indicative of advanced disease.^{2,4,5} This pain may be due to intermittent intussusceptions of an affected segment, mesenteric ischemia due to buckling of the fibrosed mesentery or arterial elastosis, or frank obstruction. Unlike other cancers, the size of the primary tumor does not necessary correlate with presence of metastatic disease (with the exception of appendiceal carcinoids).^{2,4} Often times, the diagnosis is made only after the development of carcinoid syndrome (flushing, wheezing, and diarrhea) due to the serotonin produced escaping hepatic clearance when cancer cells metastasize to the liver or retro-peritoneum strictures.

Admission for intestinal obstruction can be due to a variety of causes and is a frequent event in hospitals around the world. In one series intestinal obstructions accounted for 3% of all surgical admissions and up to 20% of all acute abdominal conditions requiring admission by other observers.^{6,7} Post surgical adhesions are the most common etiology of acute

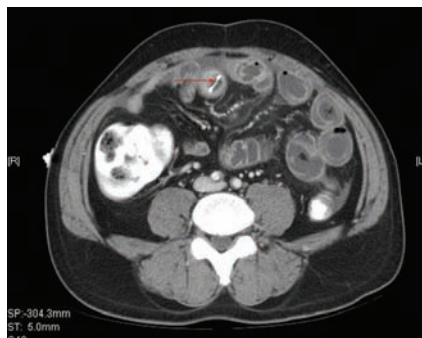


Figure 1. Metallic piece in the lumen of the thickened small bowel.

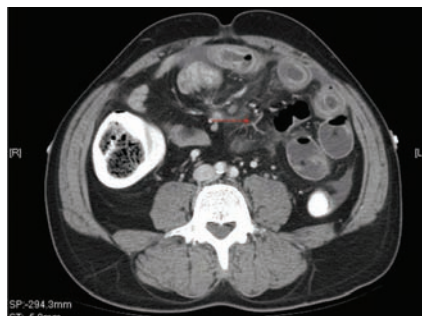


Figure 2. Mesenteric thickening and lymphadenopathy.

mechanical obstruction of the small bowel (SBO) and account for 60-80% of all cases of intestinal obstruction in the developed world.^{6,8} Hernias are recognized as the second most common etiology of mechanical small bowel obstruction in developed countries.⁷

Malignant small bowel obstruction is the third, and a much less frequent, cause of hospital admission in developed countries. In one series, it accounted for less than 5% of small intestinal obstructive cases, but can make up to 7.4% of all admissions for small bowel obstructions.^{7,9} Although most small bowel tumors found at autopsy are benign (75%), those that present with symptoms or are found during surgery are usually malignant.¹⁰ The most common tumor of the small bowel is an adenoma, which is generally asymptomatic. Gastrointestinal stromal tumors are the most common symptomatic benign tumors of the small bowel. Several theories attempt to explain the low incidence of tumorigenesis in the small bowel including rapid turnover of mucosal cells, rapid transit of luminal contents, low bacterial counts, and the alkalinity of chyme.^{10,11} Population clusters do exist, but potential risk factors for the development of malignant disease of the small intestine are poorly defined.^{3,11}

Masses causing intraluminal obstruction or extrinsic compression are rarely obstructive in

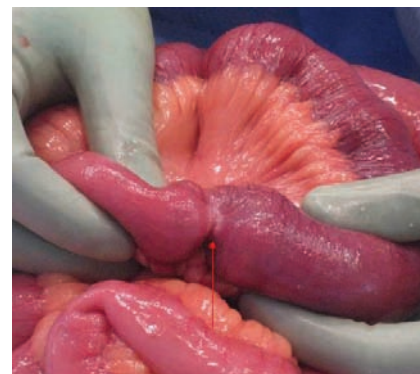


Figure 3. Small bowel carcinoid tumor seen in operating room.



Figure 4. Specimen opened to reveal the primary carcinoid tumor and the adjacent beer can lid induced mucosal damage.



Figure 5. Beer can lid retrieved from the small bowel lumen adjacent to the carcinoid tumor.

the small intestine due to the liquid nature of the small bowel enteric contents. Even a very small luminal channel is sufficient for the passage of all residuals of digestion, with the exception of an indigestible non-yielding foreign object. In this patient, a preexisting and previously undetected, asymptomatic small intestinal neoplasm caused the retention of a foreign body resulting in the complete obstruction of the small bowel. This resulted in an interesting and unique etiology of a small bowel obstruction. Such an unusual combination of factors resulting in a bowel obstruction has not widely been reported in literature due to the rarity of such a condition. A foreign object that is small enough

to pass through the esophagus and pylorus is unlikely to cause obstruction anywhere else along the lower gastrointestinal tract. Therefore, when a foreign object is found to be obstructing at the mid portion of the small bowel, suspicions of a preexisting small bowel neoplasm should be raised and a timely exploratory surgery should be conducted.⁸

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