Radiology Case Reports

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Colorectal Adenocarcinoma Presenting as Abdominal Wall Cellulitis

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A 73-year-old woman ultimately proven to have perforated colorectal adenocarcinoma presented to the emergency department with cellulitis of the abdominal wall. This case illustrates the challenge of diagnosis and management of such patients. It demonstrates limitations of colonoscopy and the importance of computed tomography to diagnose and characterize the disease. The optimal strategy for percutaneous abscess drainage and the utility of pre-operative radiation therapy for such rare presentations of colon cancer are discussed. Favorable outcomes are achieved despite the locally-invasive colon cancer.

Case Report

A 73-year-old woman with history of a colon polyp and anemia presented to the emergency department complaining of abdominal pain and erythema of the left lower abdominal wall. She denied nausea, vomiting, fever or chills. She had normal bowel movements and had been passing flatus. Eight days prior to her presentation in the emergency department, she had an abdominal computed tomography (CT) scan to evaluate an abdominal mass incidentally noted on routine physical exam by her primary care physician (Figs. 1-3). The scan showed a 6 cm by 9 cm mass encasing the sigmoid colon and extending into the anterior pelvic wall. Her primary care physician contacted her to arrange urgent follow-up, but she did not keep the appointment.

Five years previously, a 2.5 cm polypoid lesion had been seen at 30 cm from the anal verge by colonoscopy. Biopsy of that lesion revealed adenomatous change and focal high-grade dysplasia. Low anterior resection of the affected colon segment was recommended, but the patient declined this treatment as well as further colonoscopy.

On physical exam in the emergency department she had a low-grade fever of 100.9 degrees F per rectum, heart rate of 71 beats per minute, and blood pressure of 126/55mmHg. Her abdomen was non-distended and soft but in the left lower quadrant there was an erythematous, tender, fluctuant area. There was no guarding or rebound tenderness. On rectal exam there was normal tone and guaiac-negative brown stool. Laboratory investigation revealed an elevated white blood cell

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Abbreviations: CT, computed tomography

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Figure 1. 73-year-old woman with abdominal pain. Scout image from the outpatient CT shows displacement of descending colon and proximal sigmoid (arrows) from the normal position in the iliac fossa.

count of 18.8 (normal range 4.0-10.8 x 103 per L) with neutrophila, hematocrit 29 (normal range 36-48%), albumin 2.6 (normal range 3.4-4.8 g/dL), and CEA was 8.5 (normal ranges 0.0-3.0 ng/mL).

A repeat CT scan done at that time confirmed the previously noted mass as well as new, irregularly-marginated gas and fluid collections both deep and superficial to the anterior abdominal wall muculature (Figs. 4-5). These collections were thought to represent abscesses that had possible fistulous connection to the colon.

She was admitted to the surgical service who arranged for percutaneous drainage of the abscesses and administered intravenous antibiotics. Two pigtail drains were placed under CT guidance and a total of 30cc of fluid was drained (Fig. 6). Cultures of the fluid grew Escherichia coli and Micrococcus species. Several biopsies of the mass were obtained via sigmoidoscopy and showed tubular adenoma; however, based on the extensive disease seen on CT it was presumed that there was invasive carcinoma in other portions of the mass. Chest and abdominal CT scans showed no evidence of lung or liver metastases.

Figure 2. Axial CT of lower abdomen shows a large mass (black arrows) encasing the colon (white arrow) near the junction of the descending and sigmoid portions.

Figure 3. Coronal reconstruction of CT shows mass extending from colon and invading into anterior abdominal wall. Arrows indicate the point of exit of mass through the abdominal wall musculature.

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The Medical Oncology consultant offered the opinion that preoperative chemotherapy would be unwise due to the high risk of systemic infection from the patient's abscesses. The initial surgical strategy was centered around control of cellulitis and abscess in order to minimize surgical morbidity in this elderly patient. A significant portion of abdominal wall musculature was affected and thus would have to be removed to eliminate all diseased tissue if surgery was pursued early. Therefore, preoperative radiation therapy was planned in order to reduce the tumor burden prior to surgical resection, despite acknowledgement of risks associated with this therapy such as spread of infection and skin breakdown. A diverting ostomy was also not necessary given that she had no signs of obstruction.

Fifty point four Gy of radiation were delivered to the area of the tumor over 28 days, which is a standard preoperative radiation protocol for locally advanced rectal cancer. Radiation therapy led to rapid shrinkage of the mass. Concurrently, a 1 cm wide fistulous tract formed around the drains so that fecal material spilled from the skin and the drains fell out (Fig. 7). In an effort to contain the soilage, an ostomy bag was placed around the colocutaneous fistula. However, due to the location of the fistulous opening near the groin crease, a seal could not be maintained and there was continuous leakage (Fig. 8). The patient's mobility was limited, she

Figure 4. Scout image of CT on admission shows a radiolucent area over left iliac fossa (arrows) that suggests a focus of gas.

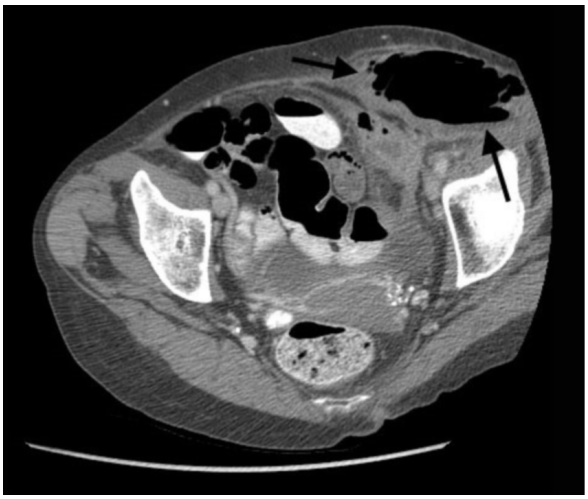

Figure 5. Axial CT shows irregularly marginated focus of gas (arrows) superficial to the abdominal wall musculature, compatible with abscess.

Figure 6. Axial CT shows the tip of one pigtail catheter (black arrow) located within the superficial abscess and another pigtail catheter (white arrow) located within the deeper pelvic abscess.

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developed painful local skin irritation, and she required admission to a skilled nursing facility for the two-month duration of her preoperative course.

Four weeks after finishing her radiation therapy, she was taken to the operating room for a sigmoid colectomy with debriedment of the abdominal wall, partial omenectomy, and creation of an end colostomy. The tumor had contracted to the point that the abdominal wall could be preserved, no tissue grafts were needed, and the wall could be closed by primary intention with retention sutures. Exploration of the abdomen revealed no liver masses and a thin mesentery with almost no visible nodes. The pathology of the resected mass showed adenocarcinoma of the sigmoid colon with dense fibrous adhesions to adipose tissue of abdominal wall. All margins were clear to a minimum of 4 cm margin, and no cancerous cells were lining the fistulous tract. None of the eight lymph nodes removed contained malignancy, classifying the cancer at Stage IIA (pT3aN0MX).

The patient tolerated her operation well, had no post-operative complications, and returned home on post-operative day thirteen after an eight day admission to a skilled nursing facility for rehabilitation. At one month post-operation she had healed her fistula and continues to do well with no complications or disease recurrence at this time.

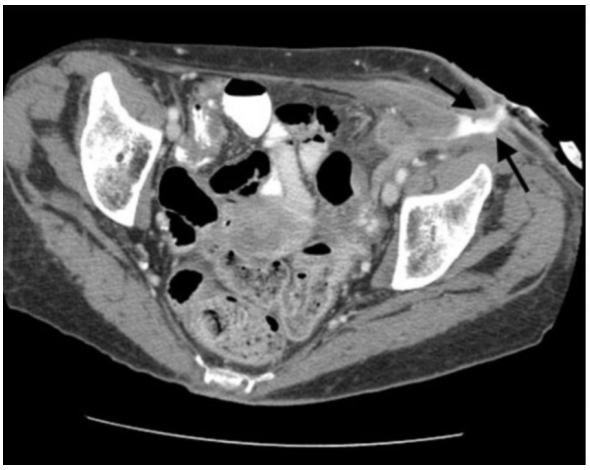

Figure 7. Axial CT shows contrast (arrows) within the enterocutaneous fistula and spilling out onto skin.

Discussion

This case illustrates the presentation of perforated colon cancer as cellulitis of the abdominal wall with abscess. This is an uncommon presentation; while colorectal cancers often present with abdominal pain or change in bowel habits, only 5% of colorectal cancers perforate the colon, 0.35% of colorectal cancers are associated with abscess, and there are sparse case reports of colorectal cancer affecting the abdominal wall at the time of diagnosis [1,2,3]. In a review of 16,000 patients treated for colon cancer at Massachussetes General Hospital between 1938 and 1970, only nine patients had a presenting complaint of abdominal wall abscess [4].

In cases such as this, proper diagnosis and accurate characterization of disease extent are critical for determining management choices and prognosis. Colonoscopy with biopsy and pathological examination can diagnose the tumor and describe its architecture, but it is limited by the fact that it can not demonstrate abnormalities beyond the lumen of the colon. Colonoscopy with biopsy is also vulnerable to sampling error, which is particularly problematic in the case of a heterogenous tumor. CT was critical in this case, suggesting that the patient had perforated colon cancer in the face of biopsy that showed tubular adenoma.

Cases of perforated colon cancer with cellulitis and abscess present challenging management choices surrounding the use of abscess drainage, chemotherapy, radiation therapy, and surgery. In our case, abscess drainage was pursued first in order to control sepsis. CT-guided percutaneous abscess drainage allowed safe access to even the deep fluid collection. It was realized by the time of the procedure that the drainage sites were likely to convert to cutaneous fistulas, given that these superficial abscesses were in communication with the bowel and thus had continuous flow of fecal matter. Fistualization occurred and caused significant decrease in quality of life and independence for the patient, as well as the cost of a two-month hospitalization. Given these significant costs, it is worth considering how management could have been improved. For instance, during CT-guided percutaneous abscess drainage more consideration could have been given to directing the drainage tracts to a cutaneous site that was more amenable to a colostomy bag. However this effort would have had to be weighed against the risks of trauma and spread

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Figure 8. Scout of CT showing the location of the groin crease (black arrows), with the external stoma device (white arrows) lying across the lateral portion of the crease.

of infection or cancer to unaffected tissue during the procedure.

A second important management choice was the decision to pursue preoperative radiation. Radiation therapy is not typically used in cases of colon cancer, although its efficacy in treating rectal cancer is well known [5]. A major rationale for the use of radiation therapy in rectal cancer is that radiation significantly decreases the rate of local recurrence, which is 20% without radiation [6]. The local recurrence rate of rectal cancer is much higher than that of colon cancer, which is explained by the facts that the anatomical constraints of the pelvis limit the extent of rectal resection and the rich lymphatic network of the rectum facilitates spread to nearby tissue [7]. Preoperative radiation of rectal cancer has also been shown to reduce tumor burden, allowing for complete tumor removal through tissue-conserving surgery [5].

In colon cancer, however, radiation is not generally effective because systemic spread of disease is of much greater concern than is local spread, making chemotherapy a more appropriate adjuvant. However, for the small subset of colon cancers that invade adjacent organs, perforate the colon, or fistulize, local recurrence rates have been recorded at between 30 and 69%. Several retrospective studies have demonstrated that intraoperative and postoperative radiation therapy can significantly improve the recurrence rate of such invasive cancers. The effect of such radiation therapy on overall survival of patients with such invasive colon cancers is not yet clear, however [8,9].

The role of preoperative radiation therapy for invasive colon cancers has not yet been systematically studied [9]. Previous case reports of colon cancers that invade the abdominal wall have used primary surgical resection of all affected tissue without preoperative adjuvant, often resulting in significant disruption of the abdominal wall and prolonged recovery [2]. The decision made in our case to use preoperative radiation to shrink the tumor in order to allow for minimally-morbid surgery was unconventional and bold. Although it will never be known to what extent the tumor was originally invading the patient's abdominal wall, the radiation treatment appeared to fulfill its purpose; the eventual operation preserved her abdominal wall and obtained 4 cm clear margins. Additionally, other than temporary skin breakdown, she tolerated the radiation well.

Our case provides an example of an unusual presentation of colorectal adenocarcinoma. It illustrates the challenges associated with diagnosing and managing such cases. It raises questions about the optimal planning of percutaneous abscess drainage and highlights the utility of preoperative radiation therapy to minimize surgical morbidity. It demonstrates that satisfactory outcomes can be achieved in such locally-advanced cases.

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