

Colon Adenocarcinoma Mimicking Acute Appendicitis in a 28-Year-Old

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Background

Colon cancer is the third most diagnosed cancer in both men and women and the second leading cause of cancer deaths in the United States (1). Colon adenocarcinoma typically presents in older patients (age >60) with common symptoms including changes in bowel habits, bloody stools, abdominal pain, unintentional weight loss, and fatigue (2). However, these symptoms can be non-specific and may not appear until the cancer is advanced, making early detection of colon cancer difficult. The American Cancer Society recently reported that the overall mortality rate of colorectal cancer has declined in the past decade, but the report also raised alarms about the drastic shift in trends of the disease; increasingly, more cases of colorectal cancer (CRC) are diagnosed in individuals less than 55 years of age and more of these new cases present with advanced stages of the disease (1). With these worrying changes, guidelines have adjusted to reflect the need to screen more individuals at a younger age. The United States Preventative Task Force (USPTF) recently lowered their colorectal screening recommendation from 50 to 45 years of age for adults with average risk of developing CRC (3). Despite these changes, diagnosis of CRC remains challenging in patients younger than 40 years of age as the disease is a skilled imitator of alternative etiologies of abdominal pain such as genitourinary infections and emergencies, bowel obstruction, and appendicitis.

Case Presentation

A 28-year-old male with no significant past medical history presented to the emergency room with worsening lower right quadrant abdominal pain for one day. The patient described the pain as pressure-like, non-radiating, constant, and progressively worsening overnight. At time of presentation, he rated his pain as a 5/10. Additionally, he denied experiencing similar symptoms in the past. He denied associated nausea, vomiting, fever, changes in bowel habits, decreased appetite, recent weight loss, or changes in his diet or medications. He reported no recent illnesses, trauma, or past abdominal surgeries. He also denied personal and family history of GI disorders or colon cancer.

On arrival to the ED, patient was afebrile, normotensive, and hemodynamically stable. Physical examination of the patient was notable for tenderness on palpation of the right lower quadrant with no associated rebound or guarding. Labs revealed leukocytosis. A CT abdomen and pelvis with contrast was performed and showed no bowel obstruction and perienteric inflammation but the appendix was not visualized. However, the radiologist noted pericecal stranding and prominent right lower quadrant lymph nodes that were concerning for acute appendicitis (Figures 1). At this time, general surgery was consulted for an emergency appendectomy. The on-call surgeon carefully reviewed the CT scan with the in-house radiologist as the appendix was unable to be identified on imaging and, after further discussion, it was decided that given the inflammation surrounding the cecal region, acute appendicitis could not be ruled out. The general surgeon proceeded with emergent laparoscopic appendectomy with possible open conversion. The patient was taken back to the OR the same-day. Intra-operatively, the surgeon visualized an appendiceal mass-like structure adhered to the terminal ileum which was not able to be separated due to concern for injury to surrounding structures (4). The appendix was noted to be very large and hard to palpation and so, the decision was made to convert to an open ileocecectomy. Once the abdominal cavity was opened, the terminal ileum was freed from the appendiceal mass-like structure, with the specimen left intact and sent to pathology for further inspection and testing (Figure 4). Successful end-to-end anastomosis of the terminal ileum and right colon was achieved and the patient tolerated the procedure well without any complications.

Four days after the appendiceal specimen was removed, the pathology report revealed findings consistent with invasive, moderately differentiated adenocarcinoma of the colon. The tumor measured 5.5 x 3.5 x 3 cm and was located at the appendiceal orifice just beneath the ileocecal valve and extended into the proximal half of the appendix, arising from a tubulovillous adenoma. The tumor invaded through the muscularis propria into the subserosal fat but did not extend to the serosal surface. There was no lymphovascular or perineural invasion of the tumor. Additionally, the specimen was negative for malignancy to 5 regional lymph nodes.

Imaging

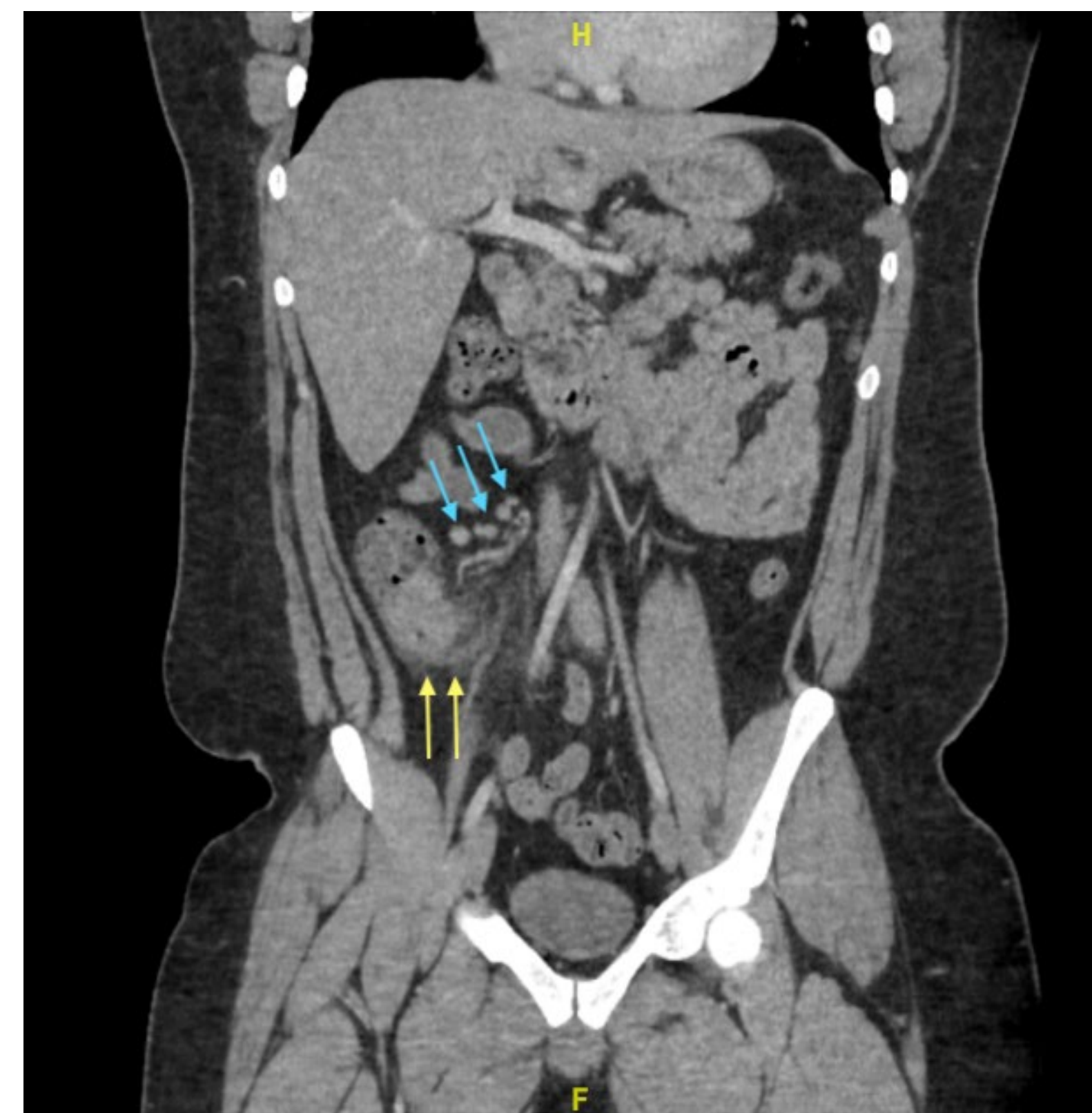


Figure 1: CT abdomen and pelvis with IV contrast on admission, coronal; perienteric inflammation and surrounding pericecal fat stranding (yellow arrows) with prominent right lower quadrant lymph nodes (blue arrows). These findings are consistent with acute appendicitis but the appendix was not visualized on imaging of this patient in any view.



Figure 2: Gross pathology of appendiceal specimen; 5.5 x 3.5 x 3 cm tumor was located at the appendiceal orifice just beneath the ileocecal valve and extended into the proximal half of the appendix, arising from a tubulovillous adenoma. Pathology results of the lesion demonstrated moderately differentiated colon adenocarcinoma.



Figure 3: CT abdomen and pelvis with IV contrast on admission, axial; A mass-like structure (encircled by red arrows) in the area of the cecum with surrounding bowel matting that correlates with the gross pathology specimen of the tumor seen in Figure 4 below. Again, the appendix was not visualized on imaging in this view

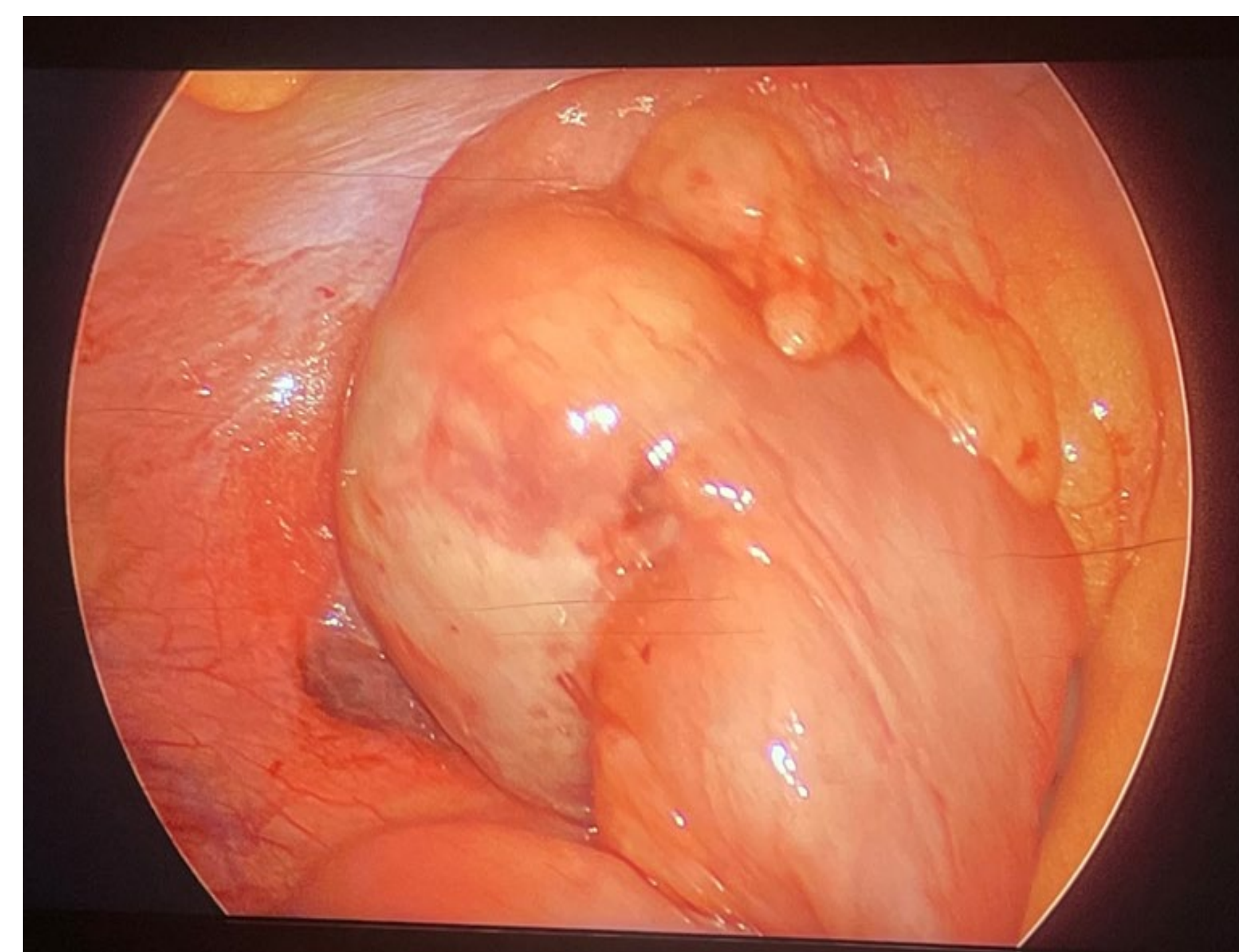


Figure 5: Intraoperative photo demonstrating appendiceal mass-like structure with adherence to the terminal ileum. The structure was noted to be hard to palpation.

Discussion

Appendicitis is one of the most common surgical emergencies, occurring most often in the second and third decades of life, and typically presents with symptoms of periumbilical pain that migrates to the right lower quadrant with possible associated nausea, vomiting, fever, and anorexia (4-6). The pathophysiology of appendicitis is characterized by the inflammation of the small finger-like pouch located at the junction of the terminal ileum and cecum, usually by a fecalith or lymphoid hyperplasia (5, 6). Although the diagnosis can be made on clinical symptoms alone, abdominal imaging is routinely performed to confirm suspected appendicitis. According to the American College of Radiology, CT imaging is generally the most appropriate and accurate study for evaluating suspected appendicitis and other causes of right lower quadrant abdominal pain (7). Due to the high specificity and sensitivity, most CT studies evaluating for appendicitis are obvious and uncomplicated but occasionally, the appendix is not visualized or presents with ambiguous features (7,8). It is rare for appendicitis to be the presenting sign of cecal adenocarcinoma, but a few cases have been reported, almost exclusively occurring in individuals > 55 years of age (9-11).

Adenocarcinoma of the colon is one of the most common histopathological types of CRC and incidence of colon adenocarcinoma ranks fourth in men and third in women in the US. It is associated with specific lifestyle factors such as a high-fat, low-fiber diet, physical inactivity, obesity, smoking, and family history of gastrointestinal diseases and cancers (2). The incidence of colon adenocarcinoma increases with age (as seen with most other malignancies) and increasing age is recognized as the major unchangeable risk factor for the development of CRC. Overall CRC-associated mortality has dropped worldwide due to widespread screening with colonoscopy, but there has been an alarming uptick in diagnosed cases in adults under 40. Studies have attempted to elucidate factors that may be driving this trend of CRC in young patients, but the etiology of rise in cases remains unclear (2, 12).

Colonoscopy is the gold stand screening test of choice for CRC. Currently, guidelines recommend that colonoscopy screening for CRC begin at age 45 in individuals with average lifetime risk, with repeat colonoscopy every 10 years (3). CT imaging of the abdomen and pelvis is not recommended as first-line in the detection of CRC as it cannot distinguish lymph node involvement or depth of tumor invasion. Rather, CT imaging is better utilized in preoperative staging of tumors, identifying local and distant spread of the malignancy, and monitoring disease progression pre- and post-chemotherapy (13). In recent years, CT colonography has become another valuable, less invasive option for CRC screening, as the acquired images are process to recreate 2D and 3D images of the colon that the radiologist reads.

Conclusion

Since the incidence of CRC continues to increase in individuals under 40 years of age, it is imperative for physicians to be aware of unusual presentations of the malignancy in this population. As CRC can mimic other common GI abnormalities, diagnosis of CRC can be delayed due to low suspicion for malignancy in younger adults. Nonetheless, physicians must remain alert as the cause for the increase of CRC in young adults remains unclear.

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