Case Report

Nonmucinous adenocarcinoma of the cecum presenting as appendicitis complicated by hepatic abscess

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ABSTRACT

A 59-year-old man presenting with right upper quadrant pain was found to have hepatic abscesses on CT imaging. After draining the abscess, a repeat CT 3 weeks later indicated that the cause of the hepatic abscesses was appendicitis. Upon surgical resection of the base of the cecum and appendix, an adenocarcinoma was demonstrated along the cecal wall both invading and occluding the appendix. The patient was initially treated for complications of appendicitis, but this case indicates the importance of considering additional etiologies for complex appendicitis. This case report provides a pathology-proven case of well-differentiated, nonmucinous adenocarcinoma of the cecum presenting as a complication of appendicitis and discusses standard treatment options. This case report also reviews the pathophysiological aspects of hepatic abscess as a complication of appendicitis as well as the importance of considering malignancy in a patient presenting with complications of appendicitis.

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Case report

A 59-year-old man presented to the emergency room with right upper quadrant pain and leukocytosis. A contrast-enhanced CT of the abdomen and pelvis showed hypodense lesions throughout the right hepatic lobe (Fig. 1) and enlargement of the appendix with subtle periappendiceal stranding (Fig. 2). There were no significantly enlarged right lower quadrant lymph nodes on the initial CT and there were no comparison studies available.

The hepatic collection was percutaneously drained under CT guidance and demonstrated findings compatible with hepatic abscess. The patient was treated conservatively with antibiotics for appendicitis. A percutaneous drainage catheter was placed in the right upper quadrant (Fig. 3) and the patient returned within 3 weeks with right lower quadrant pain. At this time, the patient had a repeat CT which showed progressive enlargement of the appendix and increased periappendiceal stranding compatible with acute appendicitis (Fig. 4). The appendix and a portion of the cecum were surgically removed and sent to pathology.
Fig. 1 – Contrast-enhanced Axial CT: Initial presentation on September 1, 2016, demonstrating a multiloculated complex hypodense hepatic collection.

Fig. 2 – Contrast-enhanced Axial CT: Initial presentation on September 1, 2016, demonstrating an abnormally thick appendix without much periappendiceal inflammation.

Fig. 3 – Contrast-enhanced Axial CT: Percutaneous drainage catheter placed on September 6, 2016. Histopathology indicated infectious collection.

Fig. 4 – Contrast-enhanced Axial CT: (above) Initial presentation on September 1, 2016 and (below) Progression of appendicitis 29 days later. The appendix and a portion of the cecum were subsequently removed and sent to pathology.

Fig. 5 – (A) Cecum adenocarcinoma 100x. (B) Appendix base with cecum adenocarcinoma involvement 40x.

Pathologic examination demonstrated that the primary disease was a well-differentiated invasive carcinoma arising from a villous adenoma with carcinoma infiltrating through the colonic wall into subserosal tissue (Fig. 5A). The tumor occluded the appendiceal orifice and caused adhesions about the terminal ileum. Examination of the mid to distal appendix (corresponding with the abnormality on the initial CT – Fig. 2) showed margins along the staple line positive for adenocarcinoma involvement (Fig. 5B) suggesting Stage III disease. At
the time of initial surgical resection in 2016, 5 local right lower quadrant lymph nodes were resected but were uninvolved.

One year later, after attempted surgical excision, the patient returned and a contrast-enhanced CT of the abdomen and pelvis demonstrated an enlarged right upper quadrant lymph node involving the right anterior pararenal fascia which was not present on initial CT scan (Fig. 6). PET/CT evaluation of these lymph nodes demonstrated increased uptake (Fig. 7A and B). Mesenteric lymph node excisional biopsy at this 1 year follow-up showed metastatic adenocarcinoma consistent with the colon as the primary malignancy. A determination was made at this time that the patient had recurrent disease. The patient subsequently completed 6 cycles of adjuvant chemotherapy with FOLFOX. Follow-up PET/CT imaging 2 years after the initial diagnosis demonstrated no evidence of recurrence throughout the abdomen or pelvis and the previously noted metastatic lymph node was significantly smaller and did not demonstrate increased uptake (Fig. 8).

**Discussion**

Cross sectional imaging plays a large role in the diagnosis of appendiceal infection and while colonoscopy remains
the gold standard in diagnosing cecal adenocarcinoma, CT colonography is being considered more frequently in the diagnosis of small masses. This case elucidates the importance of considering malignant etiologies as a factor where the complications of appendicitis are the initial presentation. Cases of appendiceal mass causing acute appendicitis are rare, but have been reported [3]. The possibility of malignancy should be considered in elderly patients, recurrent appendicitis in the absence of surgical treatment, and appendicitis which is refractory to antibiotic treatment. As in the case of invasive cecal adenocarcinoma, infiltration of tumor through the adjacent bowel wall can result in appendicitis. In fact, in one case series, 40% of cecal adenocarcinoma presented as appendicitis [1].

Abscess formation within the liver can also be seen as a complication of appendicitis, but has been rarely reported as a complication of colonic malignancy [2]. While hepatic abscess formation is commonly seen in infectious spread, hepatic abscesses associated with acute appendicitis are rare, especially in western civilizations as antibiotic treatment is widely available [4]. Appendicitis was once the primary cause of pyogenic hepatic abscess. However, biliary disease and
biliary spread have now surpassed it as the most common etiology [2].

Hepatic abscesses secondary to appendicitis are generally considered to relate to vascular spread of disease, as the majority of patients demonstrate bacteremia. In addition, the majority of the abscesses are solitary and involve the right hepatic lobe. Most recent reports have found Klebsiella pneumonia to be the most commonly isolated bacteria. However, blood cultures do not do fully reflect the bacteria recovered from the abscesses themselves [5]. Given the high mortality rate, percutaneous drainage and antibiotics are considered the treatment of choice.

The imaging findings of cecal adenocarcinoma are well described with most colorectal carcinomas causing asymmetric narrowing of the bowel lumen and demonstrating soft tissue density. While the rectosigmoid colon remains the most commonly affected portion of the colon in the setting of neoplasm, the cecum and ascending colon are involved up to 20% of the time. Recurrence within 2 years is common and tumor markers and PET/CT are used to detect recurrence and distal metastasis [9].

Cecal adenocarcinomas are generally treated with surgical removal in addition to a right-sided lymph node dissection proximal to the primary feeding vessel and associated central lymph nodes [6]. A minimally invasive approach is recommended when expertise is available [7]. Adjuvant chemotherapy is generally advised for stage III colon cancer and often for high-risk stage II disease. There is currently minimal recommendation for radiation therapy, although there is some research demonstrating benefit [8].

In summary, this case of nonmucinous adenocarcinoma causing obstruction of the appendiceal lumen is a relatively rare cause of appendicitis, but a primary appendiceal malignancy causing these findings is even more uncommon. As in this case, the first presentation of cecal adenocarcinoma was right upper quadrant pain. It is important to keep in mind that the complications of appendicitis warrant consideration for an additional cause of the appendicitis. This is especially important to consider in elderly patients. Complications of appendicitis such as the one discussed in this case, thrombophlebitis, or perforation can also lead to detection of underlying localized colonic malignancy and possibly a favorable outcome.

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