

Case Report

A wolf in sheep's clothing: concomitant appendicitis with occult cecal adenocarcinoma

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ABSTRACT

We present the case of an 89-years-old female with an atypical presentation of an obstructive acute appendicitis secondary to a cecal carcinoma. The physical exam revealed a distended abdomen with bilateral lower quadrants tenderness without rebound or rigidity. CT scan demonstrated distal small bowel obstruction and ruptured acute appendicitis. Patient was treated conservatively with nasogastric decompression, intravenous fluids, and antibiotics. She later underwent CT guided drainage of a rim-enhancing fluid collection and her symptoms eventually resolved. She returned a week later and a CT imaging showed high grade distal small bowel obstruction, and findings were a 4.5 cm diameter cecal mass. She underwent an exploratory laparotomy and modified right hemicolectomy with ileostomy for. She had an uneventful postoperative course. Pathology revealed poorly differentiated adenocarcinoma of the cecum stage III T4N1Mx. Appendectomy for appendicitis is the most commonly performed emergency operation in the world. Appendicitis are often rare in elderly, with atypical or delayed presentation and expanded differential diagnosis, making preoperative diagnosis challenging. With the increase overall risk of cancer in this age group, occult colonic carcinoma should be high in the differential diagnosis. Three mechanisms potentially leading to obstruction of the appendiceal lumen by the tumor includes: immediate proximity to the lumen, inflammatory changes from the tumor, back pressure on the cecum causing obstruction of the appendix. Despite advances in imaging, local inflammation, collections, and masses may be misleading. The diagnostic accuracy of CT scan reportedly can be as low as 54% for cecal tumors.

Keywords: Appendiceal mass, Appendicitis, Cecal mass, Colon cancer

INTRODUCTION

Acute appendicitis is rare in the elderly. However, with the increase overall risk of cancer in this age group, occult colonic carcinoma should be high in the differential diagnosis.¹ Despite advances in imaging, local inflammation, collections, and masses may be misleading.

High appendicular perforation occurs in the elderly with phlegmon or abscess formation. Inflammatory cecal

masses and cancers are relatively uncommon, but can mimic acute appendicitis and during the operation.²

Because such lesions are rare, many are found unexpectedly at emergency operations during which sometimes the surgeons may not be able to distinguish the pathology.³ We present the case of an 89-years-old female with an atypical presentation of an obstructive acute appendicitis secondary to a cecal carcinoma.

CASE REPORT

An 89-years-old Chinese female, with a past medical history of hypertension, presented after being found down after a fall at home. The patient was lethargic, hypotensive and laboratory values revealed rhabdomyolysis (CPK of 558 U/l) and an elevated Cr of 1.1 mg/dl. A head CT ruled out an acute intracranial pathology. She was admitted to the medical service and underwent fluid resuscitation. On hospital day 2, CPK level increased and she started complaining of lower abdominal pain with vomiting. Upon questioning, the patient's family mentioned preceding bouts of abdominal pain. The physical exam revealed a distended abdomen with bilateral lower quadrants tenderness without rebound or rigidity. CT scan demonstrated distal small bowel obstruction and ruptured acute appendicitis (Figure 1-3), and an ill-defined 5 cm lesion in the left liver lobe (Figure 4). CEA and AFP levels drawn were within normal limits. Patient was initially treated conservatively with nasogastric decompression, intravenous fluids, and antibiotics. She later underwent CT guided drainage of a rim-enhancing fluid collection (Figure 5). Her symptoms eventually resolved with continued conservative management, she was discharged to a subacute rehabilitation facility. She returned a week later and a CT imaging showed high grade distal small bowel obstruction, and findings were a 4.5 cm diameter cecal mass. She underwent an exploratory laparotomy and modified right hemicolectomy with ileostomy for (Figure 6 and 7). She had an uneventful postoperative course. Pathology revealed poorly differentiated adenocarcinoma of the cecum stage III T4N1Mx (Figure 8 and 9). The patient refused chemotherapy and was discharged with outpatient follow ups. She was readmitted a few months later with numerous metastatic lesions extending to the right adnexa and obstructing the ileostomy. The patient and her family elected for comfort measures only, and she expired one month later.

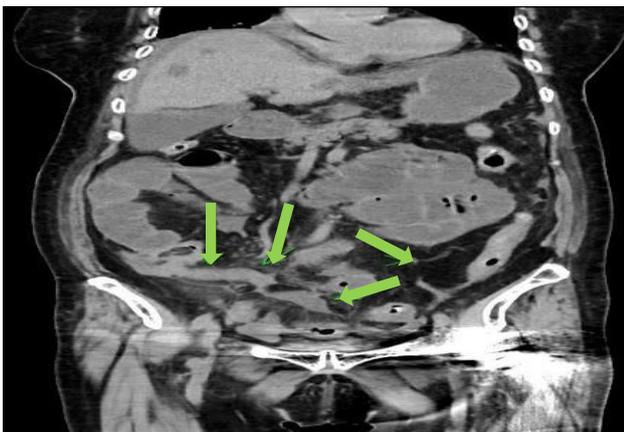


Figure 1: CT imagine on admission, coronal; dilated bowel loops of small bowel, (decompressed terminal ileum green arrows patient right, center green arrow fluid collection, left green arrowhead atherosclerotic plaque).

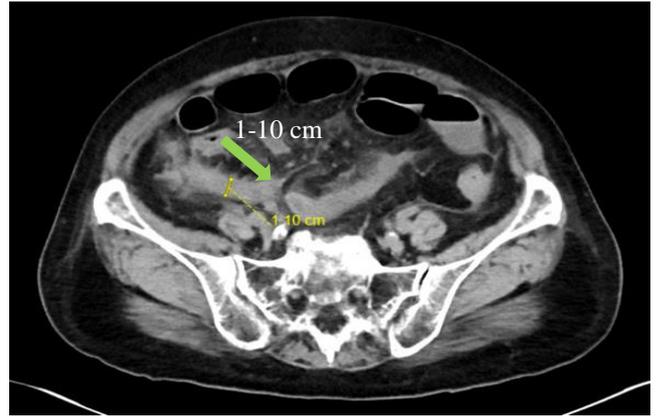


Figure 2: CT image on admission, axial; appendix and peri appendiceal inflammatory changes.



Figure 3: CT image on admission, sagittal again demonstrated peri appendiceal inflammatory changes (blue and yellow arrows demonstrate liver lesions).



Figure 4: Axial image of liver lesions.

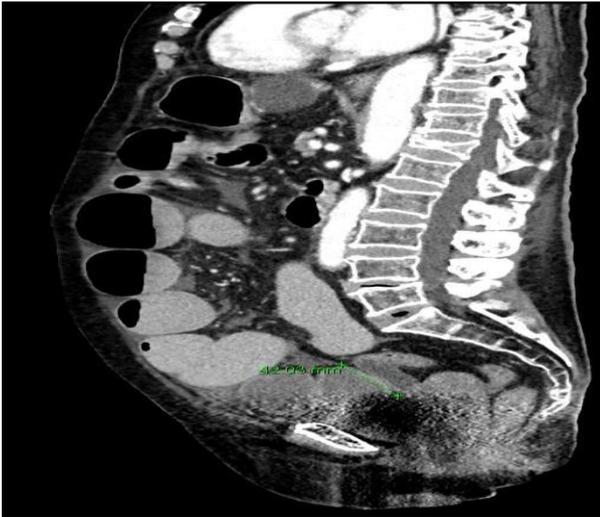


Figure 5: Sagittal CT demonstrating pelvic abscess collection.

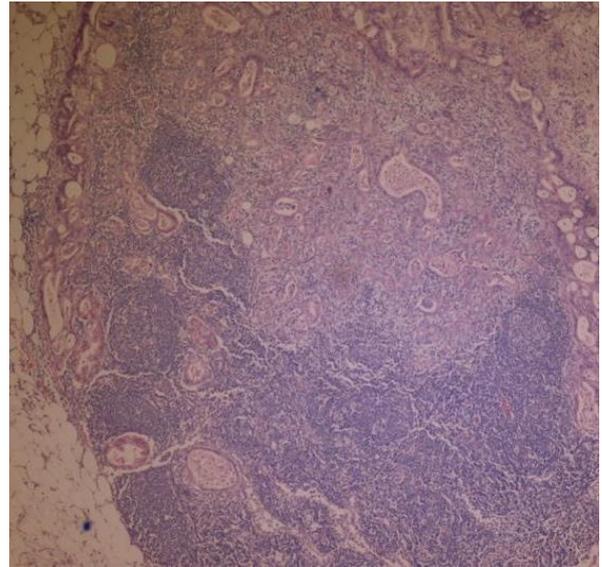


Figure 8: LN with neoplastic invasion, at 4X.



Figure 6: Gross specimen, intraoperative.

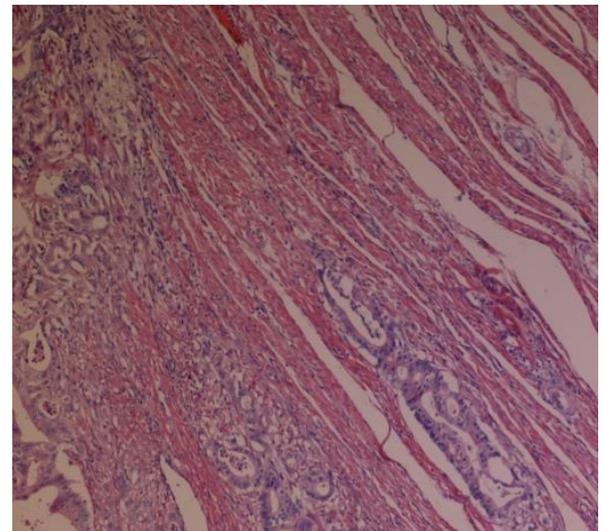


Figure 9: Neoplastic invasion into muscle, at 4X.



Figure 7: Opened mass confirms solid lesion.

DISCUSSION

In comparison to the younger patient population, elderly patients with acute appendicitis tend to have more comorbidities and decrease physiological reserves, a delayed or atypical diagnosis, higher rate of morbidity and mortality.¹ A greater delay to surgery is associated with increased perforation rates for both children and adults.² In their study of 1898 patients, Seiger et al demonstrated that in the elderly group, there was also a longer delay from admission to surgery, longer operative time and length of stay, and higher rate of complicated appendicitis.³ Perforated appendicitis with local recurrence rates as high as 28-30%, present a particular challenge, especially in the elderly.⁴ When non-operative management is chosen, it is important to remember that a cecal neoplasm may hide behind confounding inflammatory changes on CT imaging.

When cecal cancer and appendicitis coexist, there are three mechanisms potentially leading to obstruction of the appendiceal lumen by the tumor: immediate proximity to the lumen, inflammatory changes from the tumor, back pressure on the cecum causing obstruction of the appendix.⁴ The first case report on cecal cancer and appendicitis was published in 1906, but the association between the two has been mentioned in numerous textbooks.² Since appendicitis is caused by obstruction of the appendiceal lumen in over 50% of the cases, it does not come to a surprise that a malignant growth of the cecum can lead to obstruction of blood vessel and lymphatic leading to localized inflammation that leads to appendicitis.^{2,5}

The rate of adenocarcinoma found concomitantly with appendicitis is only approximately 1-2%.^{4,6} in the general population, but some authors have reported it as low as 0.84%.⁷ However in patients over 40-years-old, this rate increases to 1.76%.⁷ Mohamed et al reported an odds ratio for developing cecal pathology of 6.8 times greater in people aged 55-years-old and older.⁸

During the three-years period of our study, 544 appendectomies were performed with findings of concomitant cecal cancer in two patients, both in patients older than 65 years of age. The elderly group underwent 42 appendectomies out of the 544 (7.7%), bringing the incidence of concomitant cecal cancer to 0.047%. Older patients with acute appendicitis may not have established care providers and are at higher risk of missing routine colon cancer screening, or refusing it as our patient did. Concomitant colon cancer is often missed: One study reports 81.2% missed at the time of appendectomy.⁷ Peritoneal carcinomatosis is of primary concern, however, the literature is not conclusive regarding seeding with perforation.⁹⁻¹¹ In at least two cases in the literature seeding was suspected from an occult carcinoma of the cecum not appreciated during a previous appendectomy. Other cecal disease process may be present as acute appendicitis: Otaghvar et al described a case of a 43 years old female, with right lower quadrant pain, leukocytosis, found to have cecal endometriosis. It has been estimated that 4 to 17% of all menstruating women have endometriosis; bowel involvement occurs in 3 to 37% of the cases, with 3.5% of cecum localization.¹²

In general, diagnosis relies on CT scans of the abdomen and pelvis, which over the last decades, have become more readily available, provide better image quality, becoming the most sensitive investigation for colorectal cancer.¹³ However, the diagnostic accuracy of CT scan reportedly can be as low as 54% for cecal tumors.¹⁴ Radiologic signs are appendiceal dilatation, peri-appendiceal fluid and stranding which can also be found in other conditions such as perforated non neoplastic appendicitis, mucocele of the appendix.⁴ It is important to note that CT scan overdiagnosed an appendicular process as being a cecal neoplasm. Oner presented a 70-years-old male patient with right lower quadrant pain, a right lower quadrant mass

described on PET/CT as a hypermetabolic mass suspected to be malignant. This patient underwent an ileocectomy and the histopathological report indicated plastron appendicitis.¹⁵ Also, appendiceal neoplasm with an incidence of 1.2% can also be missed with conservative management with antibiotic alone.

CEA is often elevated in patient with cancer, but the sensitivity for stage III and IV approximately 74% and 83% respectively, however this decreases to 36% for stage I and II. CEA is not useful for detecting asymptomatic cancer as there are many false-positive and false negative results.¹⁶

Paterson's early 1956 report of 17 cases of cecal cancer and appendicitis in Roosevelt Hospital warned against the possibility of missing these carcinomas even intra-operatively, especially in cases associated with perforation and significant inflammatory changes.¹⁷ His recommendation for radical approach remains valid today. The best treatment in cases of cecal carcinoma, includes ileocectomy or right hemicolectomy via an open or laparoscopic approach. Right hemicolectomy may increase long term survival at expense of increased intraoperative time (201 vs 144 min), higher morbidity (22% vs 3%) and longer postoperative stay (11.2 vs 6.8 days).¹⁸ In laparoscopic approaches, the lack of tactile exploration of the cecum adds further difficulty for identification of small masses, and 6% of suspicious masses are found to be cancer.

CONCLUSION

There is a relative rarity of concomitant adenocarcinoma of the cecum presenting with appendicitis. However, elderly patients with extensive co morbidities and depressed immunity, often have a delayed or atypical presentation. They represent a unique subgroup in whom the possibility of concomitant adenocarcinoma should always be entertained, especially those without age appropriate screening, family history of cancer, unexplained anemia or fecal occult blood. In the shared decision-making model, they should also be expected to have an extended length of stay, and higher morbidity and mortality.

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REFERENCES

1. Omari AH, Khammash MR, Qasaimeh GR, Shammari AK, Yaseen MK, Hammori SK. Acute appendicitis in the elderly: risk factors for perforation. *World J Emerg Surg.* 2014;9(1):6.
2. Papandria D, Goldstein SD, Rhee D, Salazar JH, Arlikar J, Gorgy A, Ortega G, et al. Risk of perforation increases with delay in recognition and

- surgery for acute appendicitis. *J Surg Res.* 2013;184(2):723-9.
3. Segev L, Keidar A, Schrier I, Rayman S, Wasserberg N, Sadot E. Acute appendicitis in the elderly in the twenty-first century. *J Gastrointest Surg.* 2015;19(4):730-5.
 4. Bedel C. Cecal Diverticulitis mimicking Acute Appendicitis. *The European Res J.* 2018.
 5. Waller DG, Glasgow M. Acute appendicitis in association with non-obstructive carcinoma of the caecum. *Postgrad Med J.* 1977;53(618):234-6.
 6. Bizer LS. Acute appendicitis is rarely the initial presentation of cecal cancer in the elderly patient. *J Surg Oncol.* 1993;54(1):45-6.
 7. Lai HW, Loong CC, Tai LC, Wu CW, Lui WY. Incidence and odds ratio of appendicitis as first manifestation of colon cancer: a retrospective analysis of 1873 patients. *J Gastroenterol Hepatol.* 2006;21(11):1693-6.
 8. Mohamed I, Chan S, Bhangu A, Karandikar S. Appendicitis as a manifestation of colon cancer: should we image the colon after appendectomy in patients over the age of 40 years?. *Int J Colorectal Dis.* 2019;34(3):527-31.
 9. Cerame MA. A 25-year review of adenocarcinoma of the appendix. A frequently perforating carcinoma. *Dis Colon Rectum.* 1988;31(2):145-50.
 10. Kriwanek S, Armbruster C, Dittrich K, Beckerhinn P. Perforated colorectal cancer. *Dis Colon Rectum.* 1996;39(12):1409-14.
 11. Alcobendas F, Jorba R, Poves I, Busquets J, Engel A, Jaurrieta E. Perforated colonic cancer. Evolution and prognosis. *Rev Esp Enferm Dig.* 2000;92(5):326-33.
 12. Alizadeh OH, Hosseini M, Shabestanipour G, Tizmaghz A, Sedehi Esfahani G. Cecal endometriosis presenting as acute appendicitis. *Case Rep Surg.* 2014;519631.
 13. Colvin H, Lukram A, Sohail I, Chung KT, Jehangir E, Berry J, et al. The performance of routine computed tomography for the detection of colorectal cancer. *Ann R Coll Surg Engl.* 2013;95(7):473-6.
 14. Khan SA, Khokhar HA, Nasr AR, Carton E. Incidence of right-sided colonic tumors (non-appendiceal) in patient's ≥ 40 years of age presenting with features of acute appendicitis. *Int J Surg.* 2013;11(4):301-4.
 15. Oner AO, Boz A, Aydin F, Cevikol C. A case of plastron appendicitis mimicking malignant cecal tumor in flourodeoxyglucose-positron emission tomography/computed tomography study. *Indian J Nucl Med.* 2015;30(3):256-8.
 16. Fletcher RH. Carcinoembryonic antigen. *Ann Intern Med.* 1986;104(1):66-73.
 17. Patterson HA. The management of cecal cancer discovered unexpectedly at operation for acute appendicitis. *Ann Surg.* 1956;143(5):670-80.
 18. Poon RT, Chu KW. Inflammatory cecal masses in patients presenting with appendicitis. *World J Surg.* 1999;23(7):713-6.

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