

## Case Report of a Novel Approach to Laparoscopic Repair in a Patient with Appendiceal Perforation at the Base of the Cecum

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### Abstract

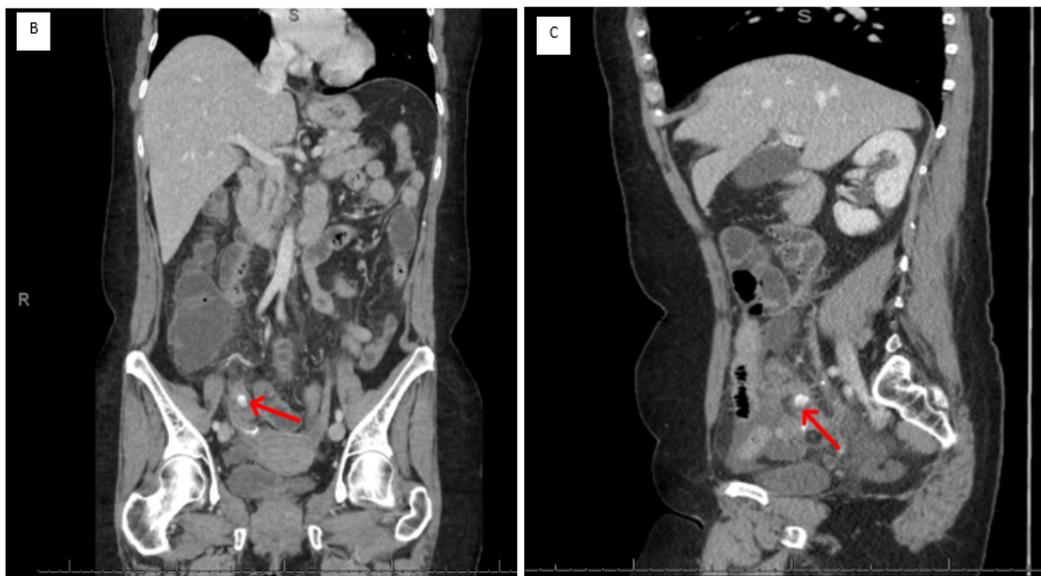
We present the case of a 60-year old female who presented with abdominal pain and malaise that was associated with fevers, diarrhea, nausea, and vomiting. A computerized tomography (CT) scan of her abdomen and pelvis revealed noncomplicated acute appendicitis. However, intraoperatively she was found to have a perforation at the base of her cecum with fecal contamination and purulence inside the abdomen. She was treated laparoscopically with stapling across the cecum followed by imbrication of the staple line and interrupted suturing with 0-Vicryl. The patient tolerated the procedure well and had an uneventful recovery with resolution of bowel symptoms. This case report presents a novel minimally invasive approach to management of cecal base perforations.

**Keywords:** Laparoscopic Repair; Appendiceal Perforation; Cecum

### Introduction and Case Presentation

The patient was a 60-year old healthy female with no significant previous medical history that presented to the emergency department with chief complaint of abdominal pain and malaise associated with fever, diarrhea, nausea, and vomiting onset two days prior. CT scan of the abdomen revealed acute appendicitis with an appendicolith along with terminal ileitis and small bowel ileus (Figure 1). Her laboratory markers and vital signs were within normal limits. On physical examination, the abdomen was noted to be soft and the patient had tenderness to palpation in the right lower quadrant (RLQ) with guarding, but no peritonitis. Given the patient's acute clinical presentation, serum laboratory values and radiological findings, the decision was made to take the patient to the operating room for a laparoscopic appendectomy. The patient successfully underwent the procedure. Pathology report findings showed a dilated appendix averaging 1.0 cm in diameter and 8.6 cm long with areas of hemorrhage and exudate present on the surface, as well as an area of rupture located 1.3 cm from the proximal margin.





**Figure 1:** CT scan of the abdomen and pelvis demonstrating acute appendicitis with an appendicolith along with suggestive findings of terminal ileitis and small bowel ileus.

## Procedure

In the operating room, the patient was positioned supine on the operating table under general anesthesia. The patient's abdomen was prepped and draped in a sterile fashion. A transverse infraumbilical incision was made. Dissection was carried down to the midline fascia. The midline fascia was carefully opened between stay sutures of 0 Vicryl and the abdominal cavity was entered. On entering the abdominal cavity, a Hansson cannula was carefully placed and balloon insufflated. Following completion of this, the lower abdomen was carefully examined and diagnostic laparoscopy was performed. Careful examination of the abdomen revealed an acute appendicitis and dense intra-abdominal adhesions, which were taken down laparoscopically and noted. The patient was also noted to have some free fluid in the pelvis as well as multiple fecaliths throughout the abdomen. Attention was then turned to the lower abdomen where 2 further 5 mm Trojans were placed, one in the right and one in the left lower quadrant. With these in position, then we proceeded with appendectomy. Attention was then turned to the appendix that was noted to be perforated at the base of the mesentery. The appendix was carefully elevated and the mesoappendix was taken down with the bipolar cautery and electrocautery. The base of the appendix was then transected with the stapler. The cecal base and staple line were reinforced with three 3-0 Vicryl interrupted sutures laparoscopically in an interrupted fashion. The appendix was then placed into the endobag for removal. At this point the abdomen was thoroughly irrigated, and care was taken to make sure the pelvis was appropriately irrigated. Once all the irrigation had been returned as clear and with no evidence of any bowel injury, bleeding, or any other abnormality noted, the procedure was terminated. All trocars were removed and a 15 French Blake drain was placed in the right lower quadrant. The fascia of the umbilicus was closed with figure-of-eight suture of 0-Vicryl. The subcutaneous tissue was reapposed with 3-0 Vicryl and the skin of all the incisions was closed with interrupted subcuticular sutures of 4-0 Vicryl.

## Discussion

Acute appendicitis remains one of the most common causes of acute abdomen to date and can be classified as uncomplicated or complicated. Surgical intervention serves as the primary standard of management for uncomplicated acute appendicitis and may be per-

formed as an open or laparoscopic procedure. Laparoscopic appendectomies yield better overall outcomes in terms of postoperative complications, duration of hospital stay, conversion, rates of reoperation and recovery time, compared to open appendectomy [2,18]. There is an ongoing debate regarding operative versus non operative management with antibiotic therapy. Recent meta-analysis studies show that non-operative management with antibiotics, in the setting of uncomplicated and complicated adult acute appendicitis, is associated with markedly fewer complications and reduced length of stay. However, there is a higher rate of relapse and lower effective rate with this treatment approach [17]. Acute appendicitis commonly presents with defining characteristics, such as McBurney point tenderness, RLQ guarding or rigidity, nausea and vomiting, electrolyte abnormalities or diffuse abdominal pain if generalized peritonitis exists. This condition is also associated with the presence of fecolith, ileal mural enhancement and an enlarged diameter. These findings are better detected by the use of computerized tomography of the abdomen [8,10]. Confirmatory CT imaging in conjunction with the analysis of serum laboratory markers, radiological and pathological studies differentiates the diagnosis of acute appendicitis from other conditions with a similar presentation [9]. Differentials to consider when suspicious of the diagnosis of acute appendicitis include appendiceal diverticulitis, giant Meckel's diverticulitis, mesenteric adenitis and appendiceal neoplasms. For instance, appendiceal diverticulitis mimics acute appendicitis presenting with RLQ pain, but the appendix is not always clearly visualized on preoperative scans, unlike in acute appendicitis. Additionally, there is an absence of fluid collection or fecolith in the appendix and perforation rates are higher in appendiceal diverticulitis [10]. Perforation of the appendix in acute appendicitis typically occurs at the tip, however, the incidence of perforation at the base of the cecum is truly a rare complication of acute appendicitis. Patients with elevated bilirubin levels have also been found to have a higher probability of appendiceal perforation compared to those with normal bilirubin levels [7]. An extensive literature review led to an isolated case report of a middle-aged male with an appendicular perforation at the base of the cecum.

This case report addressed a different surgical approach for management of perforated appendicitis at cecal base. Current standards suggest that an ileocecectomy or a right-sided hemicolectomy ought to be performed [4,6]. Invasive approaches such as these contribute to an increased length of hospital stay, prolonged recovery time and increased risk of postoperative wound infections [15]. However, there is minimal literature on other effective non-invasive approaches for surgically managing this complication. Taking into consideration the age of this patient, invasive measures potentially could have contributed greatly to her morbidity. Elderly individuals tend to have a higher rate of acute appendicitis perforation and this warrants more consideration because the potential benefits of varying operative methods in this demographic are poorly understood [12]. The novel surgical methods utilized in this case have not been mentioned in any other literature and is worth being considered as a more efficient approach to managing perforated acute appendicitis at the cecum base.

### Conclusion

Here we present a novel technique for laparoscopic management of acute appendicitis with perforation at the base of the cecum in an adult patient.

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