

## Concurrent Retrocecal and Sub-Hepatic Acute Appendicitis and Acute Cholecystitis

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**Abstract:** Acute appendicitis and acute cholecystitis are common clinical presentations that physicians encounter daily. These conditions present with specific clinical presentations that help identify them in an emergent setting. However, when anatomic variations or concurrent inflammatory process occur, non-specific clinical presentations complicate the diagnosis and surgical process.

There are few documented cases of concurrently presenting acute appendicitis and acute cholecystitis. When these conditions present together, it is often difficult to isolate which organ underwent the initial inflammatory process. Physical exam findings can be non-specific and imaging may not be confirmatory in diagnosing the origin of a specific inflammatory process. This is further complicated by varying anatomic positions of organs from patient to patient. This can lead to clinical presentations that do not correlate to traditional presentations of acute appendicitis or acute cholecystitis.

It is important for surgeons to take the variability in patient anatomy into consideration when evaluating patients, as clinical presentations may not be enough to determine the origin of the inflammatory process in an individual.

In this case, a 52-year-old female patient underwent surgery for both acute appendicitis and acute cholecystitis after presenting with clinical symptoms supporting both conditions and subsequent imaging confirming this dual diagnosis. Additionally, her appendix was found to be retrocecal and sub-hepatic, a condition that has few documented cases.

**Keywords:** retrocecal appendicitis, sub-hepatic appendicitis, acute cholecystitis

### 1. INTRODUCTION

Acute appendicitis and acute cholecystitis are common presentations of right sided abdominal pain; however, it is a rare occurrence for both conditions to occur simultaneously in a patient. In this case report, our patient presented with diffuse right abdominal pain, with physical exam characteristics suggesting both acute appendicitis and acute cholecystitis. Imaging confirmed both acute processes, with the appendix

located in the right upper quadrant proximally to the gallbladder. Emergent laparoscopic surgical appendectomy and cholecystectomy was initiated but had to be transitioned into an open procedure. There are few existing documented cases of concurrent appendicitis and cholecystitis, with even fewer presenting with an appendix located in the right upper quadrant. In this case report, the operative procedure is described, and comparisons are made to documented cases of concurrent acute processes and perforated appendicitis located in the right upper quadrant.

### 2. CASE PRESENTATION

Our patient was a 52-year-old female who presented to an outpatient primary care facility with complaints of abdominal pain that had increased in intensity over the past two weeks. The pain was described as constant, sharp, stabbing, and localized to the right side of her abdomen. She was transferred to our general surgery clinic for further evaluation and care. On consultation, her vitals sign included a blood pressure of 157/83 mmHg, pulse of 78 bpm, temperature of 98.4 F, respirations of 18 breaths per minute, and an O<sub>2</sub> saturation of 98% on room air. Physical exam was consistent with possible acute appendicitis and acute cholecystitis with a positive Murphy's sign, a positive McBurney's sign, and no guarding, rebound, or peritoneal signs.

CT scan of the abdomen and pelvis was consistent with acute appendicitis. The appendix measured 1.7 cm in diameter and the tip was located in the right upper quadrant in close proximity to the gallbladder. The gallbladder was dilated, with evidence of gallbladder wall thickening and pericholecystic fluid. The imaging was consistent with acute cholecystitis. There was also a questionable filling defect of the gallbladder, which was consistent with cholelithiasis. Emergent surgical intervention in the form of laparoscopic appendectomy with possible cholecystectomy was recommended at this time and consent was obtained.

The patient was brought into the operating room under direct anesthesia and the operating table was placed in a supine position. The abdomen was prepped and draped in usual sterile fashion. Once adequate anesthesia was confirmed, local anesthetic was injected

and a small skin incision was made at the infraumbilical skin fold. Open cutdown technique was used to gain entry to the abdominal cavity and a Hassan port was placed. Pneumoperitoneum was achieved. The laparoscopic camera was introduced into the abdomen, which revealed an acutely inflamed cecum closely adhered to the gallbladder. Another 5 mm trocar was placed in the epigastric region. The entire cecum was located in the right upper quadrant and was gently peeled off the gallbladder; however, the appendix could not be visualized and appeared to be retrocecal. At this time, the decision was made to proceed to an open procedure.

Pneumoperitoneum was released, and a right subcostal incision was made with scalpel-15. The incision was deepened through the fascia and muscle layer. The posterior fascia was incised, and the abdomen was entered. Alexis wound retractor medium was placed into the wound and the Bookwalter retractor was deployed. The surrounding tissue was gently peeled off of the inflamed gallbladder and the appendix was visualized and noted to be completely retrocecal (Figure 1). The appendix was mobilized from the surrounding tissue and delivered into the operative field. It was noted to be gangrenous and perforated, and the extensive rind was adhered to the infundibulum. A window was made in between the appendix and the mesoappendix, and the appendix was amputated at the base using an Endo-GIA blue load stapler. The mesoappendix was controlled with hemoclips and ligated. Hemostasis was confirmed.

Next, attention was turned to the gallbladder. The gallbladder was mobilized in a top-down fashion; bleeding of the liver was encountered and was controlled with electrocautery. The cystic duct was identified, along with the cystic artery. The cystic duct was clipped and cut, leaving 3 clips on the patient's side. The cystic artery was clipped and cut, leaving 2 clips on the patient's side. The gallbladder was removed from the abdomen and passed out of the field for pathology. Hemostasis was confirmed. A 19 F JP drain was deployed in the right upper quadrant and was secured to the skin using 2.0 nylon. The right upper quadrant was meticulously irrigated and all excess irrigants were suctioned out. Hemostasis was confirmed.

The anterior and posterior layers of the fascia were closed with 0 Maxon in continuous fashion. The wound was irrigated, and hemostasis was achieved. The deep dermal layer was closed with 3.0 Vicryl in interrupted fashion and the skin was closed with staples. Aquacel Ag dressing was applied. The patient tolerated the procedure well without any apparent complications.

### 3. DISCUSSION

Acute appendicitis and acute cholecystitis are common presentations of right sided abdominal pain and are often causes for surgical admission. The clinical presentation of these conditions individually can be isolated to different regions in the abdomen and with different symptoms, allowing physicians to narrow down the diagnosis to one condition or the other. In the presence of symptoms consistent with either condition, preoperative physical exam findings, laboratory values, and imaging may not be adequate enough to determine which acute process is the cause of inflammation in the region.

Clinical presentation of acute appendicitis can vary, but a common presentation is periumbilical pain that migrates to the right lower quadrant of the abdomen. This migratory pain in conjunction with other elicited signs is a strong predictor of acute appendicitis [1]. Other signs include tenderness at McBurney's point, a point that is one third of the distance proximally from the anterior superior iliac spine (ASIS) to the umbilicus, and the Psoas sign, a passive extension of that elicits friction in between the appendix and iliopsoas muscle. Complete blood count (CBC), indicating neutrophilic leukocytosis, and abdominal computerized topography (CT) scan are often obtained to confirm the diagnosis and urgency of the surgical intervention.

Similarly, acute cholecystitis often has a common clinical presentation used in diagnosis and evaluation of a patient. Signs such as persistent right upper quadrant, fever, elevated white blood cell count on CBC, and elicited positive Murphy's sign, a pause in inhalation as the diaphragm pushes the inflamed gallbladder inferiorly into the physician's fingers, are used to clinically diagnose acute cholecystitis [1]. A right upper quadrant ultrasound is performed to confirm the diagnosis, often showing pericholecystic fluid, thickened gallbladder wall, and gallstones. Alternatively, a HIDA scan can show perfusion throughout the biliary tree, but failure of perfusion of the gallbladder. Surgical intervention is recommended at this point through cholecystectomy within 72 hours in order to avoid perforation of the gallbladder.

There have been few documented presentations of concurrent acute appendicitis and acute cholecystitis, often with the organs residing in their expected, respective anatomical locations. Ghandi et al. presented a case of a 67-year-old female patient who presented with central abdominal pain that had migrated to both the right upper and lower quadrants [1]. CBC showed an elevated white blood cell count, imaging suggested acute appendicitis and acute cholecystitis, and laparoscopic appendectomy and cholecystectomy were performed [1]. Similarly, DeMuro documented a case of concurrent acute non-perforated appendicitis and acute cholecystitis with cholelithiasis in a 45-year-old

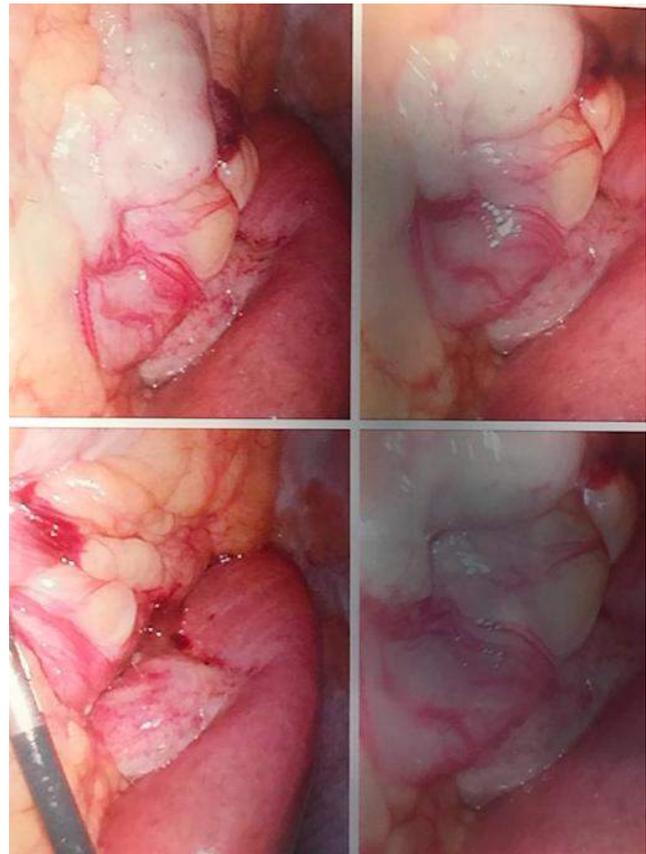
female patient with new onset abdominal pain [2]. On physical exam, his patient had a positive Murphy's sign, tenderness at McBurney's point, and epigastric tenderness [2]. Multiple areas of abdominal pain, without diffuse peritonitis, suggested multiple acute processes involved in a patient's presentation, and a laparoscopic appendectomy and cholecystectomy were performed [2]. Padrón-Arredondo et al. presented a similar case of a 43-year-old female patient with acute diffuse abdominal pain without evidence of peritonitis [3]. Imaging and physical exam findings were consistent with acute cholecystitis and a laparoscopic cholecystectomy was performed, where a concurrent acute appendicitis was discovered, and appendectomy was also performed [3]. In these cases, the presenting symptoms are consistent with both acute appendicitis and acute cholecystitis; however, in contrast to our case, the respective organs were located in their expected anatomical locations.

Similarly, the same presenting symptoms also occur when only acute appendicitis is present, but with the appendix located anatomically proximal to the gallbladder. Chiapponi et al. presented a patient with a perforated appendix that was located retrocecal and sub-hepatic [4]. A defect in the midgut rotation process, in which the cecum descends into the right iliac fossa after formation of the ascending colon and hepatic flexure, could have to lead to the sub-hepatic location of the appendix [4]. The patient's appendix had perforated and presented with symptoms suggestive of acute cholecystitis and a laparoscopic approach was successful in the surgical management of this patient [4]. Another retrocecal and sub-hepatic appendicitis case in a 38-year-old male was documented by Algin et al., where the presenting symptoms were suggestive of acute cholecystitis [5]. Ultrasound suggested no acute findings; however, contrast enhanced MDCT (multidetector computed tomography) showed pericholecystic fluid [5]. In these cases, the appendix was located retrocecal and sub-hepatic with an acute inflammatory process; however, there was no evidence of concurrent acute inflammatory processes involving the gallbladder and cholecystectomy was not performed.

#### 4. CONCLUSION

In our patient's case, concurrent acute appendicitis and acute cholecystitis were present, in combination with the retrocecal and sub-hepatic location of the appendix. This unique combination is different from the cases referenced, yet presents similarly when initially evaluating a patient. Concurrent acute appendicitis and acute cholecystitis present with diffuse abdominal pain without evidence of peritonitis and with possible physical exam findings such as Murphy's sign, tenderness at McBurney's point, rebound, and

guarding. Although imaging can suggest a specific acute process, these cases have demonstrated that that is not always the case, with unexpected findings during laparoscopic surgery. It is important for surgeons to take the variability in the acute processes into consideration when evaluating patients, as presentations may be similar across different combinations of acute processes.



**Figure 1.** represents the inflamed appendix and acute cholecystitis.

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