

Synchronous acute appendicitis and acute cholecystitis, is it a myth or reality? A literature review

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Abstract: Acute appendicitis and acute cholecystitis are some of the most common surgical emergencies in the emergency department. Both conditions are common causes of abdominal pain. We had a discussion about co-existing acute appendicitis and cholecystitis and if it is a myth. The concurrent presentation of acute appendicitis and cholecystitis is thought to be rare. A PubMed search of MEDLINE was performed using a combination of the keywords “acute appendicitis” and “acute cholecystitis” to obtain case reports. The search returned 11 case reports of co-existent acute appendicitis and acute cholecystitis. The aim of this review is to broaden the prospective of emergency physicians to consider more than one pathology as the cause of abdominal pain. The concurrent presentation of acute appendicitis and cholecystitis is rare but should be considered to avoid complications such as perforation and septicemia.

Keywords: synchronous, acute appendicitis, acute cholecystitis

Introduction

Acute appendicitis and acute cholecystitis are some of the most common surgical emergencies in the emergency department.^{1,2} and both are common causes of abdominal pain.³ Acute cholecystitis requiring surgery is frequent in developed countries and increases with age.⁴ We discussed in our surgical department the possibility of co-existing appendicitis and cholecystitis and if it was a myth or reality. Numerous studies reported that they occur simultaneously.^{1,3-8} We reviewed the literature for case reports of co-existing appendicitis and cholecystitis.

Methods

A PubMed search of MEDLINE was performed to identify case reports, using a combination of the keywords “acute appendicitis” and “acute cholecystitis”. The search was not limited by language, publication year or origin. All case reports without full text reports or abstracts were excluded from the search. The search returned 11 case reports of co-existent acute appendicitis and acute cholecystitis. The search was conducted in January 2018 and June 2018. The cases were compared to each other using Microsoft Excel.

Results

The 11 case reports referred to seven female and four male patients. The average age of the patients was 52.3 years. The initial presentation in four cases was upper abdominal pain.^{1,7,9,10} Five cases presented with right-sided abdominal pain,^{3,4,6,9,11} and two cases

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presented with diffuse or central pain.^{5,8} Six patients were diagnosed with synchronous acute appendicitis and cholecystitis by computed tomography (CT).^{1,3,5,6,8,11} Three cases were diagnosed with acute cholecystitis initially with abdominal ultrasound (US).^{4,7,10} All the patients underwent a surgical intervention, except one case that was managed with US-guided percutaneous gallbladder drainage and intravenous antibiotics.⁸ The cases are summarized in Table 1.

Discussion

Acute appendicitis and acute cholecystitis are common acute conditions in the emergency department.² The establishment of the diagnosis of acute appendicitis can be a challenge, as 20–30% of patients present with atypical symptoms.¹² Acute appendicitis can present with central diffuse pain in elderly patients, who also have a higher threshold of pain.⁵ Usually history of short right upper abdominal pain and murphy's sign in clinical examination for acute cholecystitis are less accurate in elderly patients.⁵ In the literature, there are some case reports of the concurrent presentation of acute appendicitis and cholecystitis.^{1,3–11} Acute cholecystitis can present as acalculous^{1,3,7} or calculous.^{4–6,8–11} The most frequent diagnostic modality reported in the 11 case reports was a CT scan of the abdomen.^{1,3,5} The accuracy of CT in diagnosing acute appendicitis was over 90%.¹³ In general, CT scan is superior to clinical examination.⁵ There was no anatomical abnormality or relation mentioned in the reviewed case reports.^{1,3–11} The majority of patients with abdominal pain have single pathology, none the less double pathologies should be considered.⁶

Carter¹⁴ described biliary reflux or gallbladder dyskinesia associated with acute appendicitis that was relieved after an appendectomy. According to one hypothesis of the pathogenesis of concurrent appendicitis and cholecystitis, it is the result of direct bacterial invasion or translocation from the muscularis propria of a gangrenous appendix into the portal venous system.⁵ The latter can lead to impairment of bile salt excretion and bacterial contamination of the gallbladder bile, causing acute cholecystitis.⁵ This hypothesis is supported by the incidence of hyperbilirumnia in acute appendicitis.¹⁵ *Escherichia coli* is the most frequent organism found in a perforated appendix, and *E. coli* endotoxin may lead to bile salt excretion and direct damage to liver cells at a cholangiolar level.¹⁶

Laparoscopy is considered the ideal single surgical modality to perform a cholecystectomy and an appendectomy in the same setting.⁷ However, some cases have been managed with open surgical procedures (open cholecystectomy, open

Table 1 Cases of synchronous acute appendicitis and acute cholecystitis

Case	Age	Sex	Initial presentation	Diagnostic investigation	Treatment
Sedik ¹	35	Female	Right upper quadrant pain	CT abdomen	Laparoscopic cholecystectomy and appendectomy
Victory ³	40	Male	Right-sided abdominal pain	CT abdomen	Laparoscopic cholecystectomy and appendectomy
Salih ⁴	66	Female	Right-sided abdominal pain	US abdomen	Laparoscopic cholecystectomy and open appendectomy
Gandhi ⁵	67	Female	Diffuse abdominal pain	CT abdomen	Laparoscopic cholecystectomy and appendectomy
DeMuro ⁶	45	Female	Right-sided abdominal pain	CT abdomen	Laparoscopic cholecystectomy and appendectomy
Sahebally ⁷	23	Male	Right upper abdominal pain	US abdomen	Laparoscopic cholecystectomy and appendectomy
Lee ⁸	78	Male	Diffuse abdominal pain	CT abdomen	(PTGBD) and intra-venous antibiotics
Black ⁹	76	Female	Right-sided abdominal pain	Clinical diagnosis	Laparotomy
Black ⁹	69	Male	Right upper quadrant pain	Clinical diagnosis	Open cholecystectomy and open appendectomy
Padrón-Arredondo ¹⁰	43	Female	Right upper quadrant pain	US abdomen	Open cholecystectomy and open appendectomy
Shweiki ¹¹	29	Female	Right-sided abdominal pain	CT abdomen	Laparoscopic cholecystectomy and appendectomy

Abbreviations: CT; computed tomography; US, ultrasound; PTGBD, percutaneous gallbladder drainage.

appendectomy and laparotomy)^{9,10} or non-surgical treatment.⁸ To remove the gallbladder and appendix in the same setting, the placement of five ports, including a supra-umbilical optical port is proposed.⁶

Conclusion

Abdominal pain in the emergency department is usually the result of a single pathology. Emergency physicians should consider more than one abdominal pathology as the cause of abdominal pain. The concurrent presentation of acute appendicitis and cholecystitis is rare but should be considered in investigations of abdominal pain to avoid complications such as perforation and septicemia.

Disclosure

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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