Case Report
Retroperitoneal abscess and acute acalculous cholecystitis after iatrogenic colon injury: report of a case

Chengwei Dong¹², Yuxu Wang², Sanyuan Hu¹, Futian Du², Wei Ding²

¹Department of General Surgery, Qilu Hospital, Shandong University, Jinan 250012, Shandong, China; ²Department of Hepatobiliary Surgery, Weifang People’s Hospital, Weifang 261041, Shandong, China

Received January 18, 2015; Accepted March 30, 2015; Epub April 15, 2015; Published April 30, 2015

Abstract: Acute acalculous cholecystitis has a high mortality rate due to the difficulties in early diagnosis and high rate of complications like empyema, gangrene and perforation. We report a case of 20-year-old male with acute severe pancreatitis, acute renal failure and acute peripancreatic fluid collection who was transferred to our department after blood filtration treatment in ICU. After percutaneous catheter drainage for 20 hours, the patient got a high fever. Computed tomography revealed retroperitoneal colon injury. In this case, percutaneous catheter drainage was performed again and the pus cavity was flushed regularly, after which the patient’s state gradually improved. Unpredictably, septic shock appeared on the 51st day. Repeated computed tomography revealed acute acalculous cholecystitis and abscess formation. After percutaneous transhepatic gallbladder catheterization and drainage, the patient got better gradually. Three months later the retroperitoneal catheter was removed. Four months later, ultrasound examination showed normal gallbladder and the catheter was removed.

Keywords: Iatrogenic colon injury, retroperitoneal abscess, acute acalculous cholecystitis, acute peripancreatic fluid collection

Introduction
Percutaneous catheter drainage of acute peripancreatic fluid collection guided by ultrasound is safe and effective. The rate of iatrogenic injuries is usually negligible (less than 2%) for experienced doctors. Generally the injury of the surrounding organs and bleeding can be noticed [1]. Extraperitoneal colon perforation and the resulting retroperitoneal abscess have not been reported. Retroperitoneal infection resulted from colon perforation has a high mortality because of diagnostic delay and unmanageable infection [2, 3]. If acute acalculous cholecystitis (AAC) develops subsequently, conditions will become more complicated and treatment will be much more difficult. We present a case of retroperitoneal abscess and AAC induced by iatrogenic colon injury.

Case report
A 20-year-old male with acute severe pancreatitis, acute renal failure and acute peripancreatic fluid collection was transferred to our department after blood filtration treatment in ICU. One week later, the patient complained of pain and tension in the upper abdomen after a small amount of liquid diet. Abdominal examination revealed upper abdominal swelling with mild tenderness. Computed tomography (CT) of abdomen showed large amount of fluid in the lesser omental bursa and behind the descending colon. Fluid culture yielded Escherichia coli while blood cul-
ture results were negative, which confirming infection. Intravenous Biapenem (300 mg two times daily) was added to the treatment regime, which was yet ineffective.

On the 15th day percutaneous drainage was applied again with pigtail catheter (14 F) guided by ultrasound (Figure 1 Right), and the abscess cavity was irrigated regularly. Three days later, the temperature dropped to 37.8°C, blood routine examination showed WBC 9240 cells/mm$^3$ (neutrophils 69.8%). On the 31st day because of inadequate drainage, the temperature rose (38.8°C). We then replaced the catheter of descending colon and placed a catheter (14 F) in the lesser omental bursa. Both catheters were from the same puncture point (Figure 2 Left). Gradually the temperature dropped to 37.5°C.

On the 42nd day, the patient suffered from high temperature (39.0°C), dull pain in upper abdomen, loss of appetite, nausea and vomiting without obvious causes. Physical examination revealed mild jaundice, upper abdomen tenderness with negative Murphy’s sign. Pertinent laboratory values were as follows: hemoglobin 9.8 g/dl; WBC17230 cells/mm$^3$ (neutrophils 73.8%); AST 76 IU/l; ALT 83 IU/l; alkaline phosphatase 115 IU/l; total bilirubin 3.3 mg/dl; direct bilirubin 2.1 mg/dl. A chest radiograph showed no abnormalities. On the 51st day, the

Figure 1. CT angiograms showing catheter penetrating the descending colon and retroperitoneal gas (left) and catheter (14 F) in the retroperitoneal space (right).

Figure 2. Replaced catheter (14 F) in the lesser omental bursa and the space behind the descending colon (left). AAC and inflammatory exudation around the gallbladder (right).
Acute acalculous cholecystitis

Figure 3. Inflammation of the gallbladder and surrounding tissue was relieved.

The patient showed a symptom of septic shock: physiologic upset, high fever (42°C), pale face, tachycardia (heart rate was 120 beats per minute), tachypnea (breathing rate was 24 times per minute). External cooling, aggressive fluid resuscitation, dexamethasone, vancomycin combined with gentamicin were applied to combat shock. Abdominal CT and routine blood tests were performed at once. Two hours later, the condition deteriorated. Breathing rate rose to 30 times per minute, heart rate increased to 157 beats per minute, and mean arterial pressure dropped from normal to 55 mm Hg. Blood routine examination results were as follows: WBC 20000 cells/mm$^3$ (neutrophils 98.4%), HCO$_2$ - 11.9 mmol/L. Abdominal CT confirmed AAC and inflammatory exudation around the gallbladder (Figure 2 Right). Transhepatic gallbladder catheterizing drainage was made at once and 160 ml dark red pus was drained out. Four days later, the shock was relieved, and 6 days later the drainage fluid became normal bile, CT showed reduction of the inflammation (Figure 3). On the 76th day, the patient was discharged with the catheter. Three months later the retroperitoneal catheter was removed. Four months later, ultrasound examination showed normal gallbladder and the catheter was removed.

Discussion

Peripancreatic fluid collection develops in the early phase of acute pancreatitis in about 40% of all cases [4]. A mass of fluid collection may cause pain and tension, and increase abdominal pressure which can significantly worsen the efficiency of breathing [5]. The pancreatic enzymes, cytokines and inflammatory mediators contained in the effusion can lead to activation of inflammatory cells and multiple organ failure [6, 7]. Studies have showed poor outcomes of surgery to remove the effusion [8], but percutaneous catheter drainage guided by ultrasound was proved to be an ideal option because of its rapidity, repeatability, and portability, with a rate of less than 2% of iatrogenic injuries [1].

Iatrogenic retroperitoneal colon perforation is a rare but serious and feared complication for the secondary infection or abscess. Unlike the intraperitoneal region, the retroperitoneal compartments are relatively “hidden” to the examiner, and the retroperitoneal tissues may demonstrate little visible reaction to bacterial contamination. The introduction of CT has greatly improved diagnostic accuracy. CT is particularly useful to show the size, shape and extent of the abscess and therefore direct the therapy [3]. Traditionally, surgery has been the standard treatment for iatrogenic colon perforation [9]. Orsoni P et al. found that conservative method is also effective in some cases [10]. Rees JR et al. also hold the view that if adequate drainage can be achieved and infection can be controlled effectively, a conservative approach can be pursued [11]. During the treatment of the patient presented here, we also found that adequate drainage and regularly irrigation could control infection effectively and colonic perforation healed gradually.

AAC often occurs in critically ill patients, especially those who are related to trauma, surgery, sepsis, total parenteral nutrition, etc. It is difficult to diagnose because the findings of right upper quadrant pain, fever, leukocytosis, and abnormal liver tests are not specific. Usually the ultimate diagnosis of AAC relies on imaging and the most studied diagnostic criteria are GB wall thickness, pericholecystic fluid or subserosal edema, intramural gas, sloughed mucosa, sludge, and hydrops. A timely diagnosis will depend on a high index of suspicion in the appropriate patient, and the combined results of clinical findings (admittedly nonspecific), plus properly interpreted imaging [12]. Cholecystectomy is generally considered as the definitive therapy if it can be performed [13]. But for those who could not tolerate the surgery and
anesthesia for severe complications, percutaneous cholecystostomy is the preferred choice [10]. Cholecystostomy is generally plausible, rapid, and safe. If cholecystectomy is needed, cholecystostomy may provide time to optimize the patient’s condition for surgery [12, 14], while some patients may recover without further treatment [15].

In conclusion, AAC is a formidable disease, especially as a complication of severe cases. Early diagnosis is important but difficult. Percutaneous catheter drainage is useful for the treatment of retroperitoneal abscess, but adequate drainage and replacement of the catheter as occasion requires is necessary. Percutaneous catheter drainage can control the infection effectively and some patients can even recover without further surgery.

Disclosure of conflict of interest

None.

Address correspondence to: Sanyuan Hu, Department of General Surgery, Qilu Hospital, Shandong University, Jinan, Shandong 250012, China. Tel: 86-531-82169455; E-mail: syhujinan@gmail.com; Futian Du, Department of Hepatobiliary Surgery, Weifang People’s Hospital, Weifang, Shandong 261041, China. E-mail: ftdu1221@gmail.com

References