

Acalculous Cholecystitis

Satyendra Dhar, Rajive Gupta, R.K. Chrungoo, Suresh Saraf, Satish Parihar

Acute acalculous cholecystitis is an uncommon but very serious illness (1). The condition causes approximately 5-10% of all cases of acute cholecystitis. The disease may often go unrecognized due to the complexity of the patient's medical and surgical problems. Early diagnosis is essential to avoid the high rates of associated morbidity and mortality (2,3). Duncan first recognized it in 1844 when a fatal case of acalculous cholecystitis complicating an incarcerated hernia was reported. The condition can occur in persons of any age with a slight male predominance.

Etiology

The etiology of the disease remains obscure and a number of factors have been implicated. Mainly these can be divided into following groups:

- Depressed motility and starvation: surgery, burns more than three months of total parenteral nutrition (more than 3 months) narcotic analgesics, mechanical ventilation and trauma (4-9).
- Decreased blood flow through cystic artery: arteriosclerosis, congestive cardiac failure, diabetes, shock, etc.
- Infection (sepsis) / immunocompromised: AIDS (late manifestation), Candida, cholera, salmonella, campylobacter (10-12).
- Obstruction of cystic duct by extrinsic inflammation: lymphadenopathy, Metastasis, etc.

Patho-physiology

The precise mechanism is unknown; the most commonly postulated theories regarding its pathogenesis are bile stasis, sepsis and ischemia (1,13). The role of ischemia in this process, whose etiology is multifactorial, has been difficult to elucidate but may occur because of a low-flow state due to dehydration, fever, congestive heart failure, arteriosclerosis, etc.(4,9). Disturbed microcirculation may play an important role in the pathogenesis of acute acalculous cholecystitis (14). Critically ill patients are more predisposed because of increased bile viscosity due to fever and dehydration and because of prolonged absence of oral feeding resulting in a decrease or absence of cholecystokinin-induced gallbladder contraction. Over 70% of patients have atherosclerotic disease; this might explain the high prevalence of the condition in elderly men (13). Immunocompromised patients can develop primary infections caused by opportunistic organisms that result in primary infective cholecystitis (10-12).

Clinical features

Clinical examination is often not helpful, as many patients are receiving mechanical ventilation and have decreased mental awareness (2). The most frequent signs and symptoms are right upper quadrant abdominal pain, nausea, vomiting, fever, abdominal mass and jaundice (4).

Investigations

1. Biochemical markers are nonspecific and contribute to the delay in diagnosis and treatment (2).

From the Postgraduate Department of General Surgery, Government Medical College, Jammu (J&K) India.

Correspondence to : Dr. R. K. Chrungoo, Associate Prof., Postgraduate Deptt. of Surgery, Government Medical College, Jammu (J&K).

CBC count, liver function tests, and blood culture tests are some of the main laboratory tests that should be performed.

2. The diagnosis is usually made by radiological tests (1). The role of the various imaging modalities in acute acalculous cholecystitis is still somewhat controversial. Mirvis *et al.* (15) showed that sonography and CT are over 90% specific and sensitive for diagnosing acute acalculous cholecystitis, while cholescintigraphy is highly sensitive but only 38% specific.

3. Ultrasonography is an effective and accurate diagnostic test for acalculous cholecystitis (9). Computed tomographic or sonographic evidence of gallbladder wall thickness greater than or equal to 4 mm, pericholecystic fluid or subserosal edema without ascites, intramural gas or a sloughed mucosal membrane is considered diagnostic criteria for acute acalculous cholecystitis (16,17). The sonographic Murphy's sign is strongly positive. No stones or biliary sludge are visible in the gallbladder.

4. The color flow Doppler study demonstrates abnormally increased arterial blood flow to the wall of the gallbladder fundus consistent with acute inflammation.

5. Hepato-biliary scintigraphy with Tc99m-IDA shows nonvisualization of the gallbladder with prompt excretion of radio-pharmaceutical via the common duct into the duodenum.

Differential diagnosis

1. Acute pancreatitis.
2. Hepatitis.
3. Hypoalbuminemia.
4. Congestive heart failure.

Treatment

Best treatment varies, depending on underlying disease and the patient's condition (3).

When the diagnosis of acalculous cholecystitis is established, options range from conservative medical therapy to immediate surgical intervention because of the high risk of rapid deterioration and gallbladder perforation (3).

2. Surgical treatment

- Percutaneous transhepatic cholecystostomy is indicated using a pigtail catheter successfully placed under ultrasonographic and fluoroscopic guidance, particularly in the ill, elderly, or high-risk patients, since he or she is spared open surgery, both for diagnosis and treatment (1-3; 18,19). Percutaneous cholecystostomy is a safe, effective and usually definitive procedure for the treatment of acute acalculous cholecystitis (20-21).
- Open or laparoscopic cholecystectomy. The historical treatment of choice for acute acalculous cholecystitis has been cholecystectomy, but percutaneous cholecystostomy is now the mainstay of therapy, controlling the disease in about 85% of patients (9). In major burn injury, cholecystectomy is the treatment of choice; tube cholecystostomy is reserved for critically ill patients (6). Interval cholecystectomy is usually not indicated after acute acalculous cholecystitis in survivors; if the absence of gallstones is confirmed and the precipitating disorder has been controlled (9).
- Postoperative acute acalculous cholecystitis has a more fulminant course than ordinary calculous cholecystitis. Treatment consists of immediate cholecystectomy (4,5).

Complications

1. Perforation of the gallbladder.
2. Gangrene of the gallbladder.
3. Extrabiliary abscess formation.



Conclusion

Acute acalculous cholecystitis is a virulent disease of uncertain aetiology observed most commonly in critically ill patients. Early diagnosis is essential to avoid the high rates of associated morbidity and mortality. The diagnosis is usually made by radiological tests, most often by sonographic examination of the gallbladder. Depending on the clinical situation, the gallbladder should either be drained by a surgical or percutaneous cholecystostomy under local anaesthesia or removed.

References

1. Babb RR. Acute acalculous cholecystitis-A review. *J Clin Gastrol* 1992 ; 15(3) : 238-41.
2. Boland G, Lee MJ, Mueller PR. Acute cholecystitis in the intensive care unit. *New Horiz* 1993 ; 1(2) : 246-60.
3. Chung SC. Acute acalculous cholecystitis- A reminder that this condition may appear in a primary care practice. *Postgrad Med* 1995 ; 98(3) : 199-200, 203-04.
4. Howard RJ. Acute acalculous cholecystitis. *Am J Surg* 1981 ; 141(2) : 194-98.
5. Jonsson PE and Andersson A. Postoperative acute acalculous cholecystitis. *Arch Surg* 1976 ; 111(10).
6. McDermott MW, Scudamore CH, et al. Acalculous cholecystitis: its role as a complication of major burn injury. *Can J Surg* 1985 ; 28(6) : 529-33.
7. Fisher RL. Hepato-biliary abnormalities associated with total parenteral nutrition. *Gastroenterol Clin. North Am* 1989; 18(3) : 645-66.
8. Hatada T, Kobayashi H, et al. Acute acalculous cholecystitis in a patient on total parenteral nutrition: case report and review of the Japanese literature. *Hepatogastroenterol* 1999; 46(28) : 2208-11.
9. Barie PS, Eachempati SR. Acute acalculous cholecystitis. *Curr Gastrol Rep* 2003 ; 5(4) : 302-09.
10. Hiatt JR, Kobayashi MR, Doty JE, Ramming KP. Acalculous cholecystitis: a complication of critical surgical illness. *Am Surg* 1991 ; 57(12) : 825-29.
11. Gomez NA, Leon CJ, Gutierrez J. Acute acalculous cholecystitis due to *Vibrio cholerae*. *Surg Endosc* 1999; 13(6) : 730-32.
12. Landau Z, Agmon NL, et al. Acute cholecystitis caused by *Campylobacter jejuni*. *Isr J Med Sci* 1995 ; 31(11) : 698-700.
13. Savoca PE, Longo WE, et al. Does visceral ischemia play a role in the pathogenesis of acute acalculous cholecystitis? *J Clin Gastrol* 1990 ; 12(1) : 33-36.
14. Hakala T, Nuutinen PJ, Ruokonen ET, Alhava E. Microangiopathy in acute acalculous cholecystitis. *Br J Surg* 1997 ; 84(9) : 1249-52.
15. Mirvis SE, Vainright JR, Nelson AW, et al. The diagnosis of acute acalculous cholecystitis: A comparison of sonography, scintigraphy and CT. *AJR* 1986 ; 147 : 1171-75.
16. Cornwell EE 3rd, Rodriguez A, et al. Acute acalculous cholecystitis in critically injured patients-Preoperative diagnostic imaging. *Ann Surg* 1989; 210 (1) : 52-55.
17. Deitch EA, Engel JM. Acute acalculous cholecystitis: Ultrasonic diagnosis. *Am J Surg* 1981 ; 142(2) : 290-92.
18. Eggermont AM, Lameris JS and Jeekel J. Ultrasound-guided percutaneous transhepatic cholecystostomy for acute acalculous cholecystitis. *Arch of Surg* 1985 ; 120 (12).
19. Lillemoe KD. Surgical treatment of biliary tract infection. *Am Surg* 2000 ; 66(2) : 138-44.
20. Berger H, Pratschke E, Arbogast H, Stabler A. Percutaneous transhepatic cholecystostomy in acute acalculous cholecystitis. *Hepatogastroenterol* 1989 ; 36(5) : 346-48.
21. Shirai Y, Tsukada K, Kawaguchi H, et al. Percutaneous transhepatic cholecystostomy for acute acalculous cholecystitis. *Br J Surg* 1993 ; 80(11) : 1440-42.