

Laparoscopic cholecystostomy for acute acalculous cholecystitis

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Abstract. Acute acalculous cholecystitis (AAC) can occur in up to 18% of severely injured patients. Diagnosis is made by positive ultrasound findings of gallbladder sludge, hydrox, and wall thickening. There may also be recent-onset jaundice, positive ultrasound induced Murphy's sign, and unexplained sepsis. Mortality can be as high as 50%. Laparoscopic confirmation was obtained in six ICU trauma patients when omentum was drawn up over a distended gallbladder. Laparoscopic cholecystectomy (LC) was done by first directly decompressing the gallbladder through the fundus. This trocar was replaced by a 16 French Foley catheter passed through an Endoloop into the gallbladder and secured by tightening the loop around a cuff of gallbladder. Sepsis resolved in all cases. Only one required subsequent laparoscopic cholecystectomy. LC has a low morbidity and may be life saving during the early stages of AAC. It is not indicated in gangrene or perforation of the gallbladder.

Key words: Acalculous cholecystitis — Laparoscopic cholecystostomy

Acute acalculous cholecystitis may be defined as acute inflammation of the gallbladder without gallstones and is said to be found in 6% of cases of acute cholecystitis [4]. In severely injured intensive care patients a recent evaluation found that 18% had biliary sludge, temporary hydrops, and gallbladder wall thickening. These changes of acute cholecystitis occurred a mean of 11 days after injury and they were also associated with leucocytosis, fever, and right upper quadrant signs [10].

Cholecystectomy is required for gangrene or perforation of the gallbladder. However, in acalculous cholecystitis, ultrasound-guided percutaneous cholecystostomy either directly or after positive bile culture from aspiration resulted in a dramatic improvement in 18 patients treated by McGa-

han and Lindfors [8]. Most commonly, they treated critically ill trauma patients with an unknown septic source and clinical evidence of acute cholecystitis.

Mortality from acalculous cholecystitis may be as high as 50% but decompression by cholecystostomy or percutaneous drainage may be lifesaving [6]. Long-term follow-up has shown that after the acute phase has subsided, no further surgery is necessary [11]. Diagnosis can be difficult, with an estimated failure rate of ultrasound scanning as high as 42% because of the lack of stones and inability to elicit a sonographic Murphy's sign in comatose patients [8]. Use of the laparoscope to make the diagnosis has been suggested in these patients; it has a high sensitivity rate and no morbidity [3]. Taking this a step further, we describe a simple technique for performing laparoscopic cholecystostomy developed in six patients at a level 1 trauma center (Westchester County Medical Center/New York Medical College).

Patients

There were six patients, age range 22–76. Two were female; one had a closed head injury with fractured facial bones and the other had multiple spinal fractures from C-7 through T-9 with associated high spinal cord injury. Of the men, one had a closed head injury; one had a traumatic paraplegia at the T-4 level: one had multiple injuries including closed head injury with prolonged coma, brachial plexus injury, and multiple peripheral fractures; one had a closed head injury and was on dialysis for end-stage renal disease. All these patients were respirator dependent and five required tracheostomies. In three cases, about 1 week after admission, laparoscopic cholecystostomy was done at the same time as a planned laparoscopic gastrostomy and laparoscopic jejunostomy for long-term respirator support. In each case the gallbladder was found to be draped with omentum and was tense and distended. Black bile was always obtained with sludge which reverted in a few days to golden bile, after which time the cholecystostomy tube could be pulled at leisure. The other cases developed signs of sepsis with jaun-

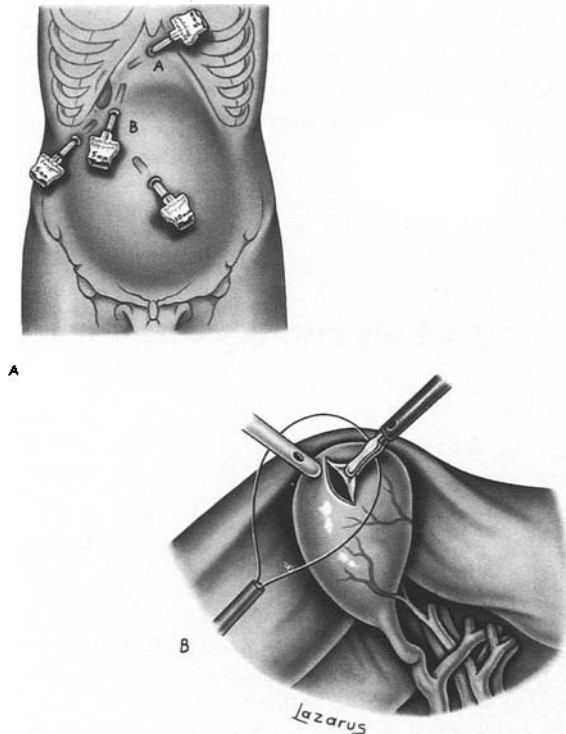


Fig. 1. A Placement of trocars for performance of laparoscopic cholecystostomy. B Foley catheter is passed through the endoloop into the previously opened gallbladder. A grasper is used to support the gallbladder opening until the Foley catheter is in place and the endoloop is pulled tight.

dice, positive ultrasound findings with sludge, distension of the gallbladder wall, and some pericholecystic fluid. One patient had omentum lying over the entire right lobe of the liver covering an extremely dilated gallbladder. Laparoscopic cholecystostomy, gastrostomy, and jejunostomy were done. Three months later this patient required a laparoscopic cholecystectomy. One closed head injury patient had a laparoscopic cholecystostomy, gastrostomy, and jejunostomy 3 weeks after admission and then rapidly recovered. One paraplegic patient had a laparoscopic cholecystostomy alone nearly 1 month after admission and then recovered.

Technique

With the patient under general anesthesia, four trocars were placed in the abdominal cavity (Fig. 1A). A 10-mm trocar was placed in the periumbilical area for the laparoscope using the Hasson technique. A 5-mm trocar was placed in the midline, two fingers breadth below the xiphoid (port A). Another 5-mm trocar was placed directly over the fundus of the distended gallbladder (port B). A third 5-mm trocar was placed in the anterior axillary line below the costal margin (port C).

A grasper was introduced via port A and the fundus of the gallbladder was picked up. A Surgiwand (a suction irrigation system combined with cautery; US Surgical Corp.) was introduced via port B. The cautery was used to enter the gallbladder and the gallbladder was immediately decompressed. The Surgiwand was removed together with port B. A 16-French Foley catheter was introduced into the peritoneal cavity via the port B site. An Endoloop (USSC) was placed via port C. The tip of the Foley catheter as well as the grasper was placed through the loop and the Foley catheter was manipulated into the gallbladder. The Foley balloon was inflated with 5 cc of fluid. The grasper was used to hold up the open fundus of the gallbladder so that on tightening the Endoloop a rim of gallbladder was secured circumferentially around the Foley catheter (Fig. 1B). The two

remaining 5-mm ports were removed and CO₂ was evacuated under laparoscopic vision until the abdominal wall came into contact with the fundus of the gallbladder. A stay suture of 2.0 silk was placed on the skin to further secure the cholecystostomy tube in the exact position to maintain the fundus of the gallbladder against the abdomen wall.

Discussion

Acute acalculous cholecystitis has a mortality approaching 50% [6]. It is very difficult to diagnose in patients with coma, high paraplegia, or quadraplegia [7, 9]. However, in the presence of unexplained sepsis, and jaundice, patients at WCMC routinely had ultrasound scans performed of the right upper quadrant. A distended gallbladder with pericholecystic edema, or the presence of sludge, was considered diagnostic for acalculous cholecystitis in these cases. Raunest et al. [10] defined distension as a gallbladder greater than 8 cm in length and 4 cm in width, and wall thickening was defined as a transverse diameter of greater than 3.5 mm; sludge was also diagnostic. Additional sonographic criteria included localized pericholecystic fluid collections, layering or a "target" or "halo" phenomenon of the gallbladder, and fragmentation of the gallbladder wall.

Decompression or removal of the gallbladder may be lifesaving in preventing progression to gangrene or rupture [6, 8]. Also, a secondary benefit of decompression of the liver is achieved, preventing ascending cholangitis from proceeding.

Endoscopic retrograde transpapillary cholecystostomy has been suggested [6], but this takes very great skill, and in addition to not being readily available, it has had a success rate of five of seven patients. The percutaneous approach had a successful decompression rate of 59–93% and a morbidity rate of 13% [2, 11]. Even with ultrasonographic and fluoroscopic control, complications such as uncontrolled bleeding could occur [11].

Haiken [5], performed laparoscopic guided tube cholecystostomy in three patients without complication. However, these were not patients with acalculous cholecystitis but patients with severe acute cholecystitis, and in all three cases pus was obtained, the gallbladder was decompressed, and the patients underwent successful interval cholecystectomy. Haiken's technique may be superior to ours in the presence of stones and when the gallbladder wall is very thick.

Arnott [1] recognized the value of laparoscopy in patients presenting with symptoms of cholecystitis but without ultrasound confirmation. However, in a similar ICU population to ours, Brandt [3] found laparoscopy was useful in distinguishing acalculous cholecystitis in four of nine patients. We are of the opinion that laparoscopy is less invasive than indirect or percutaneous approaches to the gallbladder. A direct view can be obtained, and we noted in all cases of acalculous cholecystitis that the omentum is drawn up over the distended gallbladder. This does not happen in the absence of inflammation. Having made the diagnosis, however, proceeding to an open cholecystectomy or trying to perform what may be a difficult laparoscopic cholecystectomy need not be the next step, since the surgeon is already there looking at the gallbladder. By proceeding as we did, and by intent draining the gallbladder laparoscopically, the sepsis can be resolved by simple means, as occurred in our cases. Until we obtained the Surgiwand for the

laparoscopic cholecystostomy, we did get spillage of bile on opening the fundus of the gallbladder, but we always placed a suction irrigator through right upper quadrant port B in order to minimize this problem. However, we did not attempt to completely empty the gallbladder, but merely to remove sufficient bile to prevent overflow. We also took care to raise a good collar of gallbladder fundus above the endoloop so that no spillage of bile could occur when this was tightened about the Foley catheter. Laparoscopic cholecystostomy is suggested as a simple first-stage treatment with acute acalculous cholecystitis in an ICU setting. It is specifically contraindicated in cases of gangrenous cholecystitis or in cases of existing perforation of the gallbladder. When the patient is stabilized, a decision can be made to proceed with cholecystectomy or to remove the cholecystostomy tube at a later stage.

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