

Tandem Subdiaphragmatic and Pleural Sequelae due to Lost Gallstones following Cholecystectomy

Anil Paramesh, MD, Thomas Casale, MD, Ruben Peralta, MD,
Thanh Phan, MD, Shivanna Prakash, MD, Yvan Silva, MD¹

ABSTRACT

We report two similar thoracoabdominal complications we encountered due to retained gallstones after cholecystectomy. These patients had had an open cholecystectomy after a failed laparoscopic attempt, with spillage of gallbladder debris intraoperatively. They were admitted more than 12 months later with subdiaphragmatic abscesses. Attempted computerized axial tomography (CT) guided drainage of these abscesses resulted in these patients developing pleural fluid collections, which required surgical drainage. The patients underwent exploratory laparotomies, and drainage of the subdiaphragmatic abscesses had revealed gallstones within the abscess cavity.

A detailed presentation of these cases, with review of current literature and clinicopathologic issues for discussion are described.

Key Words: Laparoscopy, Cholecystectomy, Lost gallstones.

BACKGROUND

Laparoscopic cholecystectomy is currently the surgical procedure of choice for gallstone disease. Known complications of this procedure include bowel and vascular injury, injury of the bile duct and complications of retained stones. These complications occur in less than 5% of procedures performed. Spillage of stones into the abdominal cavity has been reported in 15% - 40% of procedures performed,¹ but these are believed to be innocuous. We report two patients who suffered a similar thoracoabdominal complication due to retained intraperitoneal gallstones.

REPORT OF CASES

Case 1. A 77-year old white male had an open cholecystectomy performed after a failed laparoscopic approach in September 1995. The gallbladder was necrotic and, during dissection, a tear occurred in the fundus, causing leakage of bile and stones into the abdomen. Copious lavage and aggressive gallstone retrieval was done. His postoperative course was uncomplicated.

In January 1997, 15 months later, he was admitted with generalized weakness, weight loss of about 15-20 kgs. and intermittent bouts of fever with chills and a dull right upper quadrant pain over 12 months, which worsened over the past 2 months. The patient was afebrile, his abdomen was nontender. Laboratory tests revealed a white blood cell count (WBC) of $10.85 \times 10^9/L$, hemoglobin (Hgb) 114 g/L. Liver enzymes were within reference levels with the exception of aspartate aminotransferase (AST) 83 U/L (reference range 5 - 40 U/L). Computerized axial tomography (CT) scan of the abdomen revealed a hypodense lesion over the posterosuperior aspect of the right lobe of the liver (**Figure 1**). The patient underwent CT-guided biopsy of the lesion; this was fluid and positive for *Streptococcus viridans*. A diagnosis of pyogenic liver abscess was made, but CT drainage of the abscess was opted against by the radiologist, citing potential contamination of the pleural space. The patient underwent an exploratory laparotomy through the previous subcostal incision. A large subdiaphragmatic abscess was drained. Within this abscess, there was a single gallstone, measur-

Department of Surgery, North Oakland Medical Centers, Pontiac, Michigan, USA

¹FACS, FRCS(C)

Address reprint request to: Anil S. Paramesh, MD, Department of Surgery, North Oakland Medical Centers, 461 W. Huron, Pontiac, MI 48341 USA. Telephone: (248) 857-7314, Fax: (248) 857-6793

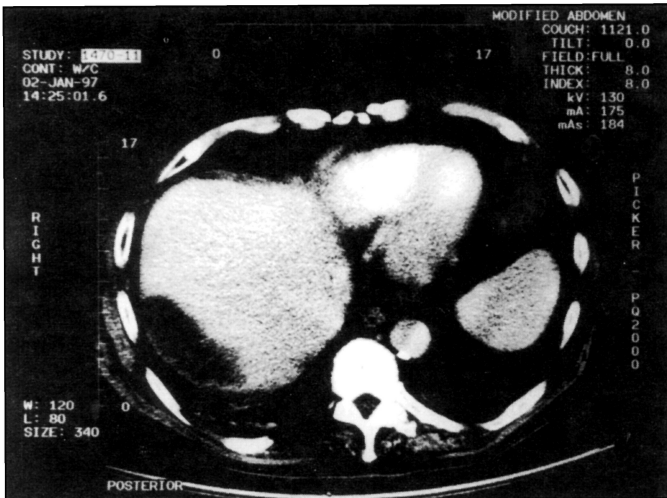


Figure 1. CT scan of the abdomen from Case 1, demonstrating a large hypodense lesion over the posterosuperior aspect of the right lobe of the liver. Within this abscess, we found a single gallstone.

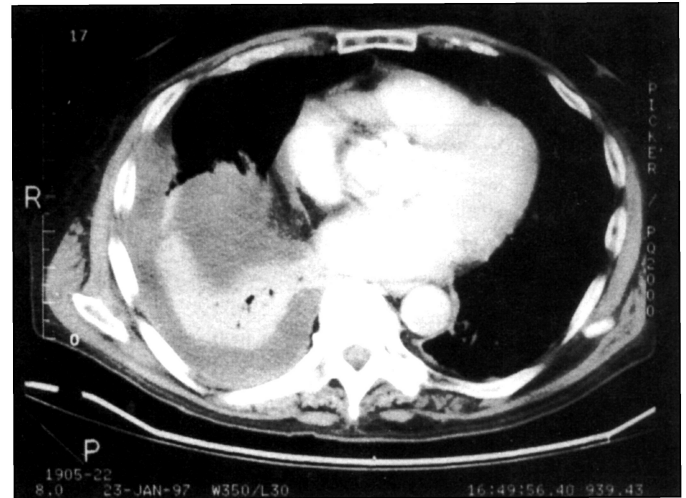


Figure 2. CT scan of the chest from Case 1, revealing a loculated empyema of the pleura on the right side, which developed after transthoracic CT aspiration of the subdiaphragmatic abscess.

ing 0.5 x 0.8 cm. The patient did well postoperatively and was discharged home on his 7th postoperative day.

The patient returned 10 days later with right-sided chest pain and intermittent fever and chills over the previous four days. He had a temperature of 38.5° C with tenderness and decreased breath sounds over his right chest wall. Laboratory tests revealed a WBC of 11.95 10⁹/L, serum alkaline phosphatase 252 (39 - 117 U/L): AST 60 (5 - 40 U/L). Chest X-ray and CT scan of his chest revealed a right-sided fluid collection (**Figure 2**). Ultrasound-guided aspiration of purulent material grew *Streptococcus viridans*. The patient underwent thoracotomy with drainage of the empyema, and decortication of the pleura. His postoperative recovery was satisfactory.

Case 2. A 78-year old white female had an open cholecystectomy after failed laparoscopic approach in September 1996. She had intraoperative spillage of bile and stones into the abdominal cavity. Her postoperative recovery was unremarkable. She was admitted 12 months later, in September 1997, with low grade fevers and a dull right upper quadrant pain which had been present since her surgery and was progressively worsening. She was afebrile, with tenderness over the right upper quadrant. WBC was 9.4 10⁹/L, Hgb 106 g/L, serum alkaline phosphatase 596 (reference range 39 - 117 U/L). CT scan revealed a hypodense lesion over the superior aspect of the liver (**Figure 3**).

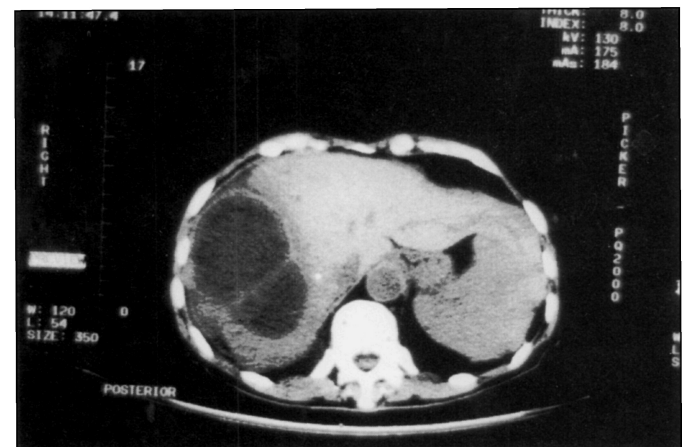


Figure 3. CT scan of the abdomen from Case 2, demonstrating an abscess over the superior surface of the right liver. Transthoracic CT aspiration could not be successfully performed as the abscess was multiloculated.

CT-guided drainage of the subdiaphragmatic abscess grew out *Escherichia Coli*. The abscess was multiloculated, and all of the pus could not be drained. Subsequent to this procedure, the patient developed a large right-sided pleural effusion. The patient underwent an exploratory laparotomy with drainage of the subdiaphragmatic abscess. Multiple small gallstones were found within the abscess cavity (**Figure 4**). The patient also had a chest tube inserted for drainage of the pleural effusion, and



Figure 4. Operative photograph from Case 2, demonstrates the subdiaphragmatic abscess cavity with multiple gallstones seen within.

evaluation of the fluid revealed no organisms growing from it. Postoperative recovery was satisfactory and the patient went home on the 10th postoperative day.

DISCUSSION

The natural history of gallstones placed intra-abdominally has been studied in animals, and these suggest that gallstones undergo partial lysis or sterile fibrotic encapsulation.¹ However, there are numerous reports of gallstones being the nidus of intra-abdominal abscesses¹⁻⁵ bowel obstructing phlegmons and cutaneous fistulae.^{2,6} The relation of infection of biliary debris to these complications is unclear.⁷ Cultures of the bile during our initial operations were not taken, but it would have been interesting to note if these organisms were the same that were isolated from the abscesses.

There is insufficient evidence to support conversion of a laparoscopic procedure to a laparotomy based solely on the spillage of bile, or even the leaving of multiple stones intraperitoneally after the procedure. One cannot be complacent, however, with a suspected stone drop during a laparoscopic cholecystectomy. Methods of removing spilt stones include individual removal with forceps in case of large stones and suction and irrigation with a wide bore device in case of multiple small stones.⁶ These stones may also be placed in an intraperitoneal bag and removed en masse.^{6,8} The application of hemoclips, sutures and endoloops intraoperatively on a torn gall-

bladder, as well as placing the gallbladder inside an endoscopic bag immediately upon dissection, has also been described.⁹

Percutaneous drainage of a subdiaphragmatic abscess is an accepted method of treatment today. Percutaneous drainage offers lower invasiveness and cost and has equal efficacy in drainage of intra-abdominal abscesses when compared to surgical drainage.¹⁰ Transpleural drainage may be associated with increased complications but has a success rate similar to that of extrapleural drainage.¹¹ Laparoscopic drainage of subdiaphragmatic abscesses have also been described.¹² However, after reviewing our cases retrospectively, we doubt whether these subdiaphragmatic abscesses could have been drained laparoscopically due to their location over the posterosuperior aspect of the liver. Also, in Case 2, the abscess being multiloculated would have made such laparoscopic attempts difficult. The treatment of an empyema secondary to a laparoscopic cholecystectomy may require a decortication with removal of stones which may have eroded through the diaphragm.⁵ Both of our patients required drainage of pleural fluid collections, although Case 2 appeared to have developed a large sympathetic effusion.

It is good surgical practice to attempt to remove all debris spilt intraoperatively during a laparoscopic cholecystectomy, but this does not necessitate conversion to a laparotomy in most cases. It is also important for the surgeon to be mindful of delayed complications in patients presenting with vague symptoms after a laparoscopic cholecystectomy.

References:

1. Shocket E. Abdominal abscess from gallstones spilled at laparoscopic cholecystectomy. Case report and review of literature. *Surg Endosc.* 1995;9(3):344-347.
2. Catarci M, Zaraca F, Scaccia M, Carboni M. Lost intraperitoneal stones after laparoscopic cholecystectomy: harmless sequelae or reason for reoperation? *Surg Laparosc Endosc.* 1993;3(4):318-322.
3. Cullis SN, Jeffrey PC, Mclauchlan G, Bornman PC. Intraperitoneal abscess after laparoscopic cholecystectomy. *Surg Laparosc Endosc.* 1992;2(4):337-338.
4. Gallinaro RN, Miller FB. The lost gallstone. Complications after laparoscopic cholecystectomy. *Surg Endosc.* 1994;8(8):913-914.
5. Willikes CL, Widmann WD. Empyema from lost gallstones: a thoracic complication of laparoscopic cholecystectomy. *J Laparoendosc Surg.* 1996;6(2):123-126.

6. Memon MA, Jenkins HJ, Fitzgibbons RJ. Spontaneous erosion of a lost intra-abdominal gallstone through the back eight months following laparoscopic cholecystectomy. *JLS*. 1997;1(2):153-157.
7. Brunt PH, Lanza RJ. Subhepatic inflammatory mass after laparoscopic cholecystectomy. *Arch of Surg*. 1994;129:882-883.
8. Patterson EJ, Nagy AG. Don't cry over spilt stones? Complications of gallstones spilled during laparoscopic cholecystectomy. *Canadian J Surg*. 1997;40(4):300-304.
9. Leslie KA, Rankin RN, Duff JH. Lost gallstones during laparoscopic cholecystectomy: are they really benign? *Canadian J Surg*. 1995;37(3):240-242.
10. Bufalari A, Giustozzi G, Moggi L. Postoperative intraabdominal abscesses: percutaneous versus surgical treatment. *Acta Chirug Belgica*. 1996;96(5):197-200.
11. McNicholas MM, et al. Percutaneous drainage of subphrenic fluid collections that occur after splenectomy: efficacy and safety of transpleural versus extrapleural approach. *Am J Roentg*. 1995;165(2):355-359.
12. Robles PJ, Lancaster B. Laparoscopic drainage of right subdiaphragmatic abscesses: report of one case. *J Laparoendosc Surg*. 1996;6(1):55-60.