

Lost Gallstones as a Cause of Recurrent Sub-Phrenic Abscess After Laparoscopic Cholecystectomy: Laparoscopic Treatment Aided by Intraoperative Ultrasound Scanning

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Abstract

An 86-year old man was referred 2 years after his laparoscopic cholecystectomy (LC) to the chest multidisciplinary team with cough, thrombocytosis and a normal chest radiograph. A chest computed tomography (CT) scan identified a right upper quadrant intrabdominal collection better defined on abdominal CT scan as a right sub-phrenic collection with no obvious cause seen. Initial treatment with a percutaneous ultrasound (US) guided drain insertion and antibiotics resulted in an apparent resolution followed by a recurrence of a large collection within 4 months necessitating a second drain which dislodged within 3 days. A laparoscopic drainage aided by intra-operative US was then performed. Three spilled stones were found in the abscess cavity. Cultures from all three procedures yielded the same organism, *Escherichia coli*. The occurrence of a recurrent abscess following a laparoscopic cholecystectomy should raise the suspicion for spilled stones, percutaneous drainage may not definitively treat the problem.

Keywords: Laparoscopic Cholecystectomy (LC); Computed Tomography (CT); Ultrasound (US)

Background

Intraoperative spillage of gallbladder contents can occur in up to a third of laparoscopic cholecystectomy procedures [1,2]. These contents have been demonstrated to contain live bacteria and should not be ignored as it can be a source of long-term debility to a patient. Recurrence of a post-cholecystectomy abscess should increase the suspicion of a spilled stone as its focus and stone retrieval in addition to abscess drainage is of more benefit.

Case Presentation

An 86 year old man first presented two years after his difficult laparoscopic cholecystectomy (LC) to the chest physicians with cough and thrombocytosis. His chest XR was normal and he had a high resolution Chest CT which only showed mild bronchiectatic changes bilaterally and an incidental large 10 x 8.7 cm lesion possibly in the right lobe of the liver. A contrast CT of the abdomen was done which better

defined it as a right sub-phrenic collection (Figure 1) measuring 10 x 10 x 6 cm and no obvious cause was radiologically identified and it was thought to be related to the scattered diverticula present throughout his colon. The upper GI surgeons reviewed and were suspicious of a spilled stone as the cause. A 10Fr locking pigtail percutaneous drain was inserted under US guidance which drained 210 ml of pus (culture yielding *E. coli*). The drain was left in situ, he was discharged with the drain which was removed after 17 days on outpatient basis. 2 months after drain removal he started feeling lethargic and was losing weight. Another CT of the abdomen was done four months after drain removal, it showed a recurrent collection (10 x 9.5 x 8 cm) (Figure 2). He had another percutaneous drain inserted, about 300 ml of pus was drained, culture again yielded *E. coli*. Drain became inactive after three days of insertion. CT imaging to re-evaluate this showed a smaller collection (8.5 x 8.5 x 5 cm) along with a dislodged drain tip and a decision was made to proceed with a laparoscopic drainage the next day.



Figure 1: Axial CT image at first presentation.



Figure 2: Axial CT image at recurrence.

3 ports were used (umbilical (10 mm), RUQ and epigastric ports (5 mm each), the liver was densely adherent to the diaphragm (Figure 3) and the transverse colon to the liver. Intra-operative ultrasonography was used to localize the abscess collection which was not readily visible due to dense adhesion of liver to the diaphragm guiding the division of the adhesion and access to the cavity. The abscess cavity was opened (Figure 4), three small black pigment stones (Figure 5) were seen in the cavity which was irrigated, suctioned dry and a size 20 Fr Robinson drain was left in the cavity (Figure 6). Culture again yielded *E. coli*. He was discharged home with his drain and antibiotics. Drain was removed about two weeks later and follow-up US scan arranged after 3 months confirmed resolution of his problem. One year after his laparoscopic drainage, he has remained well.



Figure 3: Intraoperative picture at laparoscopy, dense liver adhesion to diaphragm.

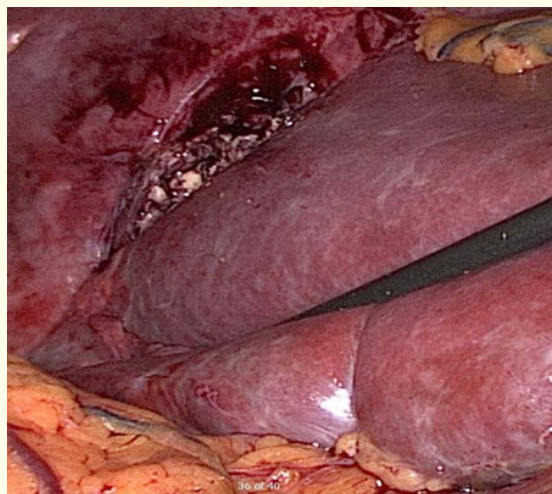


Figure 4: Intraoperative picture; exposure of abscess cavity.

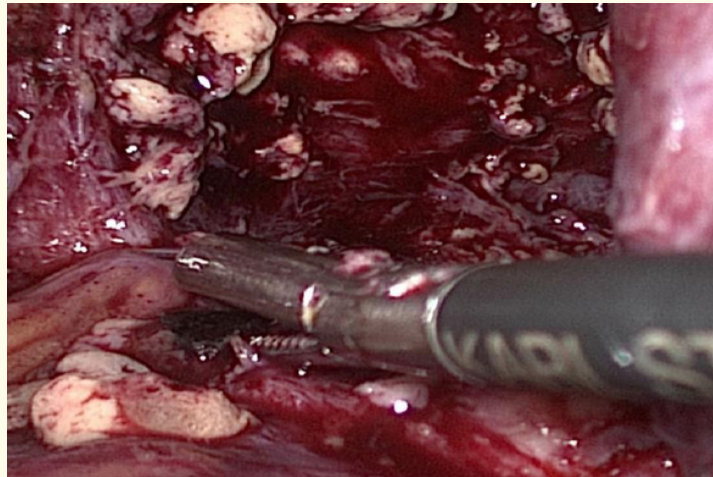


Figure 5: Intraoperative picture at laparoscopy, dense liver adhesion to diaphragm.

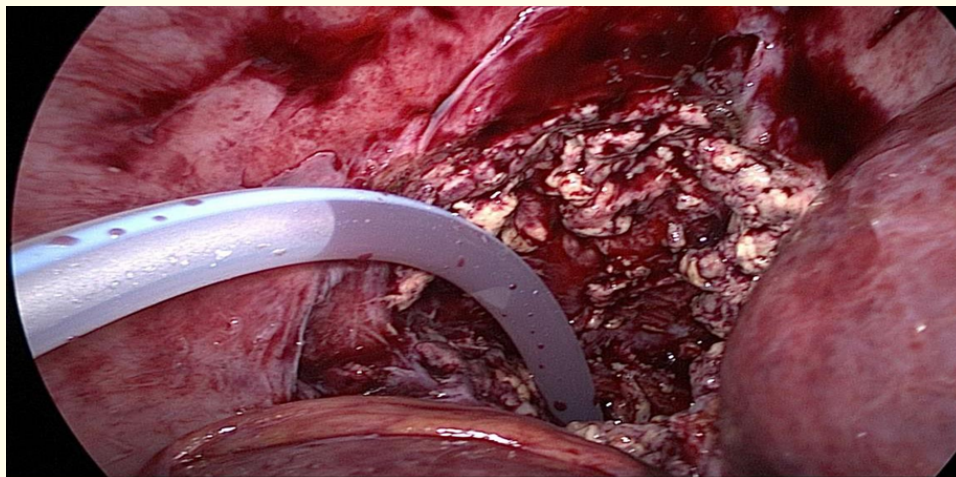


Figure 6: Intraoperative picture; cleaned abscess cavity with drain inserted.

Investigations

Preoperative CT images aided diagnosis (Figure 1 and 2), ultrasound scan aided percutaneous drainage but laparoscopy (Figure 3-6) aided both diagnosis and definitive treatment as the spilled stones could be retrieved.

Differential diagnosis

The initial CT considered colonic diverticular disease as a possible source of his colon. However, no pericolic collection or inflammation was evident to support this.

Outcome and follow-up

One year after his laparoscopic drainage, he has remained well.

Discussion and Conclusion

Iatrogenic gallbladder perforation and spillage of gallstones during laparoscopic cholecystectomy is a common intraoperative complication occurring in up to a third of laparoscopic cholecystectomy procedures [1,2] and these stones are more readily missed compared to open cholecystectomy. Various complications including an intra-abdominal collection can follow gallstones lost in the peritoneal cavity after spillage. Gallstones have been reported to contain living organisms with infective potential including enteric and non-enteric pathogens [3]. Initial drainage is most often image guided percutaneous drainage, however, recurrence should increase suspicion for a missed gallstone as a nidus for the infection [4,5]. A laparoscopic treatment approach allows a thorough inspection and washout of the cavity as well as retrieval of any spilled stones. We found the addition of intraoperative US scan aided identification of the abscess collection even when the liver is adherent to the diaphragm. Intraoperative US scan was an invaluable tool in intraoperative localization of this subphrenic posterior collection improving the versatility of the laparoscopic approach. In recurrence after a successful non-operative treatment, a spilled stone should be considered. It is necessary to retrieve this nidus for a complete resolution to occur [5] and an operative treatment may be required to achieve this with the laparoscopic approach being minimally invasive in achieving this. It is key during LCs to retrieve all spilled stones to avoid significant long-term

complications that may occur.

Learning Points/Take Home Messages

- Recurrent intrabdominal abscess after laparoscopic cholecystectomy should raise concerns about spilled stones even if they are not identified on imaging.
- Repeated non-operative treatment approaches may not treat the problem.
- Laparoscopic approach is a useful tool and adding intraoperative ultrasound improves its versatility.

Patient's Perspective

He is very satisfied with the complete resolution the laparoscopic approach offered to him.

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