

Dropped Gallstones: A Case of Persistent Right Flank Abscess Requiring Surgical Management

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Abstract

Gallstone spillage is not an uncommon occurrence during laparoscopic cholecystectomy. Once thought to be harmless, the consequences of dropped gallstones, including intra-abdominal abscess, are now recognized as a cause of significant morbidity. Additionally, patients with complications due to such an event may have delayed diagnosis due to remote, unusual presentation and failure of imaging to detect the gallstones. We report the case of a patient who presented with recurrent right flank abscesses. The patient presented multiple times and improved symptomatically with IV antibiotics and percutaneous drainage. However, each time his symptoms returned within 2 weeks of discharge. He ultimately underwent diagnostic laparoscopy, which allowed removal of the nidus of infection. A sizeable gallstone was found within the sub-hepatic abscess, despite no evidence of gallstones on prior computed tomography or record of biliary spillage in the operative report from his laparoscopic cholecystectomy. Although there are a number of treatment options available when it comes to managing abscesses due to dropped gallstones, this case emphasizes the important role of the surgical team in removing the source of infection and definitively treating the patient. This case also underscores the importance of keeping dropped gallstones in the differential diagnosis even when documentation of gallstone spillage is lacking from the operative report.

Keywords

Dropped gallstone, Gallstone spillage, Recurrent flank abscess, Sub-hepatic abscess, Peri-hepatic abscess, Hepatorenal abscess

Introduction

We have all seen it happen with a perforated gallbladder - spillage of biliary content and stones as the gallbladder is separated from the liver bed or pulled through the trocar incision, but the consequences of such spillage may be underappreciated. Laparoscopic cholecystectomy (LC) has become the gold standard in the treatment of symptomatic cholelithiasis and is the most commonly performed abdominal procedure in the United States [1]. However, similar to all operative procedures, LCs have known complications including ones not regularly encountered with open cholecystectomies, mainly gallstone spillage and biliary tract injury [2]. Spilled stones were once thought to be harmless, and while the majority of spillage incidents are asymptomatic, there can be serious complications.

Case History

General surgery was consulted to see a 59-year-old male presenting to the emergency room with right-sided

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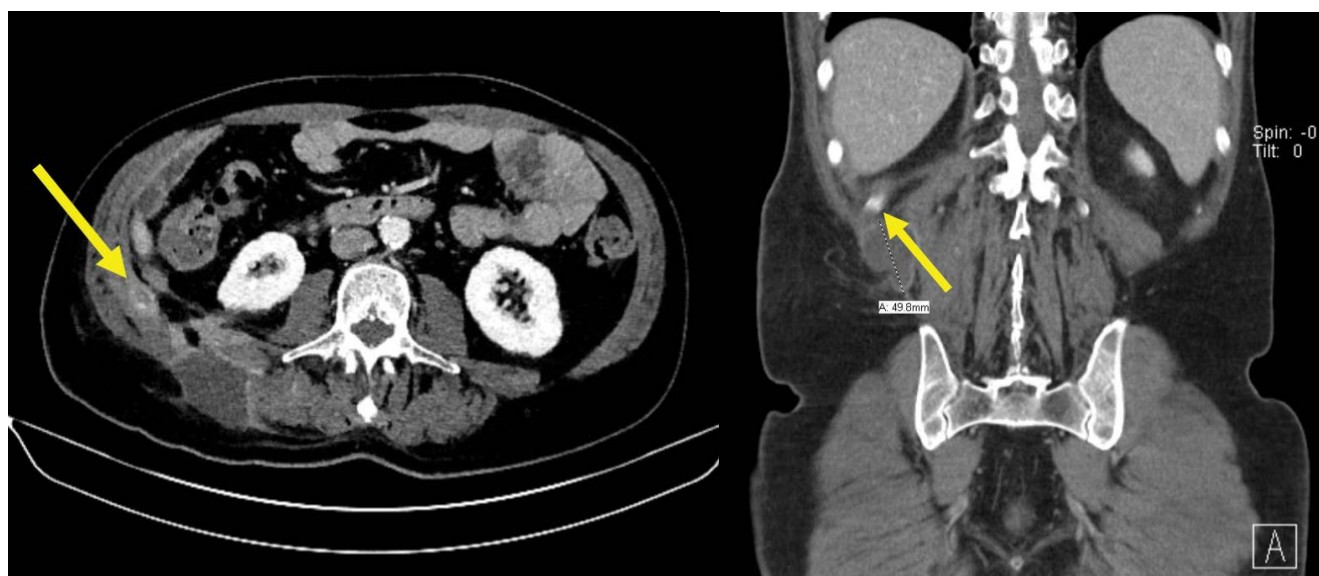


Figure 1: Pre-operative CT scan demonstrating right flank abscess (yellow arrow).

flank pain, malaise, and low grade fever, associated with a known right flank abscess. His condition caused him significant pain and was interfering with quality of life. He had a history of an uncomplicated LC at an outside hospital two years prior, with no indication of dropped stones, perforation, emphysema, or bile duct stone in the operative report. The patient had no significant past medical history and was not immunocompromised. During physical examination he was found to have fullness, induration and tenderness to palpation near the right mid-axillary region overlying the sixth rib. Complete blood count and complete metabolic panel were within normal limits. A recent outpatient ultrasound at an outside facility was only notable for an enlarged lymph node in the gastrohepatic ligament. Abdominal computed tomography (CT) at the time of admission demonstrated the presence of a 5 cm multi-lobulated subcutaneous abscess with a continuous tract to a retroperitoneal abscess. No stones were visualized on CT (Figure 1).

The patient had been hospitalized twice over the preceding six weeks but the surgery team had not been consulted. Instead he had received antibiotic therapy (initially levofloxacin and metronidazole, then linezolid and ertapenem) and had percutaneous drains placed by interventional radiology (IR) to drain the abscess during both admissions. He improved symptomatically and the abscess regressed, however each time the drain was pulled, he soon after experienced a resurgence of symptoms and repeat CT demonstrated re-accumulation of the flank abscesses. Cultures from the abscess were positive for *E. faecalis*. A peripherally inserted central catheter (PICC) line was placed for antibiotic administration and he subsequently developed a PICC-associated deep vein

thrombosis (DVT), which was treated with Xarelto. On the second day of admission, the managing team opted for non-operative treatment and a pigtail catheter placed in the patient's right flank by interventional radiology for the third time resulting in minimal drainage. Failure of the abscess to resolve completely after repeated drainage pointed to a nidus of infection that was not being adequately addressed. Given the patient's surgical history and location of the abscess a retained stone was a likely source. However, the diagnosis was not definitive as we did not visualize any stones on imaging and review of the LC operative report did not mention any spillage of gallstones. Tuberculosis was also in the differential as the patient had a history of travel to Nepal. On the fourth day of admission, the patient underwent diagnostic laparoscopy. The drain placed by interventional radiology assisted in localizing the retroperitoneal abscess once we were in the abdomen. The abscess, in a sub-hepatic, retroperitoneal location, was unroofed, purulent fluid was drained, and a 1 cm yellow cholesterol gallstone was extracted (Figure 2). There was no bilious material or gas found within the abscess. The pigtail catheter was removed after the remaining abscess material had been debrided and the area was copiously irrigated. The patient recovered well post-operatively and was discharged home on post-operative day 1. He continued antibiotics until follow-up with infectious disease as an outpatient, at which time he was symptom free and showed no signs of abscess recurrence.

Discussion

In cases of LC performed for acute cholecystitis, the gallbladder wall is edematous and fragile, making it quite easy to tear [3]. Gallstone spillage is reported to occur in 6-30% of LCs and stones may remain in the peritoneal



Figure 2: Abscess after it was unroofed, revealing a gallstone (circled) and purulent material within the abscess.

cavity in up to 2.4% of cases [4]. Complications from spilled stones have been shown to occur in 0.08-2.3% of patients [2,4-8]. Risk factors for complications include acute cholecystitis, multiple stones (more than 15), stones greater than 1.5 cm in size, spillage of pigmented stones, peri-hepatic location of spilled stones, male sex, and old age [3,5]. Complications may be seen more commonly in the elderly due to a weakened immune response [5]. Abscess formation is by far the most common issue following gallstone spillage, accounting for 60% of complications [5]. Unretrieved gallstones harbor viable enteric and non-enteric bacteria, which lead to inflammation and infection [9]. Dropped gallstones can also lead to a myriad of other complications, including peritonitis, septicemia, cellulitis, colocutaneous fistula, lung abscess, empyema, infertility, and bladder obstruction [5]. Dropped gallstones can erode neighboring tissues over time leading to fistula or sinus tract formation [10]. Although the most typical locations for dropped gallstones are peri-hepatic and near port sites in the abdominal wall, stones may be widely disseminated within the abdomen and pelvis due to the pneumoperitoneum and irrigation [5,10]. A review of the literature reported that the majority of abscesses due to dropped gallstones occur in an intraperitoneal location or in the abdominal wall/trocar site, however 11% of abscesses occur in a retroperitoneal location [11]. It is likely that, in our patient, stones spilled into Morrison's pouch during LC, which then proceeded to erode into the retroperitoneum over the course of two years.

Complications of dropped gallstones can present distant from LC and maybe difficult to diagnose due to varying clinical presentations and locations [10]. Diagnosis is frequently delayed because of remote or

unusual presentation. The median time to presentation is approximately 5 months, however delayed presentation up to 20 years has been seen [7,10]. The diagnosis is frequently missed on initial presentation and not realized until the abscess recurs [10].

Although this patient's imaging studies never demonstrated evidence of stones, computed tomography (CT), ultrasound, and MRI can be helpful in establishing the diagnosis [5]. Typically, stones with high calcium content appear on CT, however pure cholesterol stones and stones with lower calcium content may not be seen [6]. Unfortunately, radiopaque and radiolucent stones frequently go undetected with standard imaging [10]. Radiologists often report the finding of rim-enhancing intra-abdominal collections on CT without noting the presence of gallstones [8].

Treatment of recurrent abscess due to dropped gallstones depends on location, size of the stones, and the patient's health [10]. Stones causing complications must be removed as they may serve as the nidus for recurrent abscess and fistulae. Most cases in the literature are treated with open surgical drainage [8]. Some authors recommend a surgical approach for all patients to ensure complete evacuation and avoid recurrence [6,10]. It can also be helpful to have radiologists perform preoperative CT-guided needle localization of the retained stones. Percutaneous ultrasound-guided drainage of the abscess may also be considered as a less invasive measure prior to attempting surgical intervention. The percutaneous approach works best for superficial abscesses with small stones, but can also be attempted for deeper abscesses in patients who would not tolerate surgery well [10].

Endoscopic removal of stones through a percutaneous drainage tract may be possible in patients with stones less than 1 cm in size, while stones greater than 1 cm may be fragmented prior to removal with ultrasonic lithotripsy and endoscopy [8,10]. As in our patient, percutaneous image-guided drainage and antibiotics will often only provide temporary relief until the actual nidus of infection, i.e. the stone, is removed with an open or laparoscopic approach.

Ideally all gallbladders would remain intact during removal, however this is difficult due to the fragility of the wall and enlargement of the organ secondary to inflammation. In some cases, spillage is preventable with careful dissection and use of a retrieval bag when pulling the gallbladder through the port site incision [5]. Aspiration of fluid from a tense gallbladder can also help reduce the chance of perforation. When biliary spillage does occur, it should be recorded in the operative note and the patient informed should complications arise [10]. Gallstone spillage is not an indication to convert to an open procedure, however attempts should be made to retrieve any spilled stones [5]. Irrigation and suction should be performed to minimize material left in the abdominal cavity. The majority of surgeons believe that biliary spillage and its potential complications should be included as part of the informed consent for all laparoscopic cholecystectomies [5].

Conclusions

Although the incidence is low, complications due to dropped gallstones can be a significant cause of morbidity, especially when there are multiple failed non-operative attempts at management prior to surgical intervention. As documented in this case, retroperitoneal abscesses can lead to severe pain and discomfort resulting in a significant amount of time spent in the hospital and away from work. A high index of suspicion for dropped gallstones must be maintained in patients with a history of LC presenting with peri-hepatic abscesses, even if evidence of stones on imaging is lacking. Percutaneous drainage may be helpful, but often is not definitive, ultimately requiring surgical intervention. Early involvement of a surgical team in cases of retroperitoneal abscess can prevent repeated unsuccessful

attempts at percutaneous drainage and shorten the time to definitive treatment.

Conflict of Interest

All authors declare no conflict of interest.

References

1. Demirbas BT, Gulluoglu BM, Aktan AO (2015) Retained abdominal gallstones after laparoscopic cholecystectomy: A systematic review. *Surg Laparosc Endosc Percutaneous Tech* 25: 97-99.
2. Assaff Y, Matter I, Sabo E, et al. (1998) Laparoscopic cholecystectomy for acute cholecystitis and the consequences of gallbladder perforation, bile spillage, and "loss" of stones. *Eur J Surg* 164: 425-431.
3. Jabbari Nooghabi A, Hassanpour M, Jangjoo A (2016) Consequences of Lost Gallstones During Laparoscopic Cholecystectomy: A Review Article. *Surg Laparosc Endosc Percutan Tech* 26: 183-192.
4. Woodfield JC, Rodgers M, Windsor JA (2004) Peritoneal gallstones following laparoscopic cholecystectomy: incidence, complications, and management. *Surg Endosc* 18: 1200-1207.
5. Yethadka R, Shetty S, Vijayakumar A, et al. (2014) Attitudes and Practices of Surgeons towards Spilled Gallstones during Laparoscopic Cholecystectomy: An Observational Study. *Int Sch Res Not* 2014: 1-5.
6. Morrin MM, Kruskal JB, Hochman MG, et al. (2000) Radiologic features of complications arising from dropped gallstones in laparoscopic cholecystectomy patients. *Am J Roentgenol* 174: 1441-1445.
7. Horton M, Florence MG (1998) Unusual abscess patterns following dropped gallstones during laparoscopic cholecystectomy. *Am J Surg* 175: 375-379.
8. Shum JSF, Fung KH, Yang GPC, et al. (2010) Combined percutaneous and endoscopic approach in management of dropped gallstones following laparoscopic cholecystectomy. *J Radiol Case Rep* 4: 1-5.
9. Hazrah P, Oahn KTH, Tewari M, et al. (2004) The frequency of live bacteria in gallstones. *HPB (Oxford)* 6: 28-32.
10. Ramamurthy NK, Rudralingam V, Martin DF, et al. (2013) Out of sight but kept in mind: Complications and imitations of dropped gallstones. *Am J Roentgenol* 200: 1244-1253.
11. Sathesh-Kumar T, Saklani A, Vinayagam R, et al. (2004) Spilled gall stones during laparoscopic cholecystectomy: a review of the literature. *Postgrad Med J* 80: 77-79.