

# Intrathoracic Gallstones: a Case Report and Literature Review

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## ABSTRACT

**Background:** Laparoscopic cholecystectomy is one of the most commonly performed procedures in general surgery. There have been very few reported thoracic complications from this surgical procedure.

**Methods:** We report the case of a patient who underwent a laparoscopic cholecystectomy with gallstone spillage 34 months before presenting to the thoracic surgery service. The patient first complained of streaks of hemoptysis at 6 months from the time of the original procedure. A lower lobe infiltrate was noted and treated successfully with oral antibiotics. Over the next 2 years, the patient's symptoms waxed and waned.

**Results:** Due to the chronic infiltrate in his lung, a thoracotomy was performed that revealed erosion of the stone through the right diaphragm with formation of a lung abscess.

**Conclusion:** A high index of suspicion for a gallstone-related problem should be entertained by the practitioner when presented with a patient who has a right lung infiltrate and a history of open or laparoscopic cholecystectomy.

**Key Words:** Cholelithiasis, Laparoscopic cholecystectomy, Lung abscess.

## INTRODUCTION

Gallbladder perforation during laparoscopic cholecystectomy occurs in 10% to 32% of patients, with gallstone spillage in 0.2% to 20% of cases. There have been very few reported thoracic complications from this common problem.<sup>1</sup>

Before laparoscopic cholecystectomy, cholelithoptysis and intrathoracic complications from gallstones were rare because the operative field was packed off to facilitate the open surgery. Introduction of a pneumoperitoneum and intraoperative irrigation facilitates distant migration of gallstones, specifically to the subphrenic space.

A review of the literature reveals 11 reported cases of gallstones being found in the thoracic cavity following cholecystectomy. Eight cases presented as cholelithoptysis and the latest one as massive hemoptysis from a gallstone associated abscess. We believe these findings reiterate the need for fastidious stone removal at the time of initial cholecystectomy. Furthermore, while most patients with this problem present with cholelithoptysis, a high index of suspicion should be entertained by the practitioner when encountering a patient who has a right lung infiltrate and a history of open or laparoscopic cholecystectomy.

## CASE REPORT

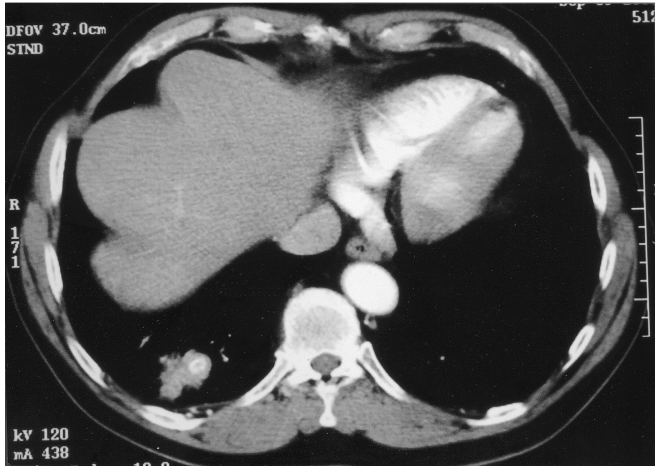
A 73-year-old man with a past medical history of hypertension and chronic obstructive lung disease presented with a 4-month history of biliary colic and mild pancreatitis. After 3 days of conservative management with nothing by mouth and intravenous antibiotics, his pancreatitis resolved, and he underwent laparoscopic cholecystectomy. Intraoperatively, there was reported spillage of gallstones, with most being retrieved laparoscopically. He did well postoperatively and was asymptomatic for 6 months until he developed low-grade fevers and streaks of hemoptysis. Computed tomography of the chest revealed a 5x7-cm pulmonary infiltrate in the posterior basilar segment of the right lower lobe associated with a 5x9-mm oval calcification at the level of the right diaphragm (**Figure 1**). There was no clear radiographic evidence of a

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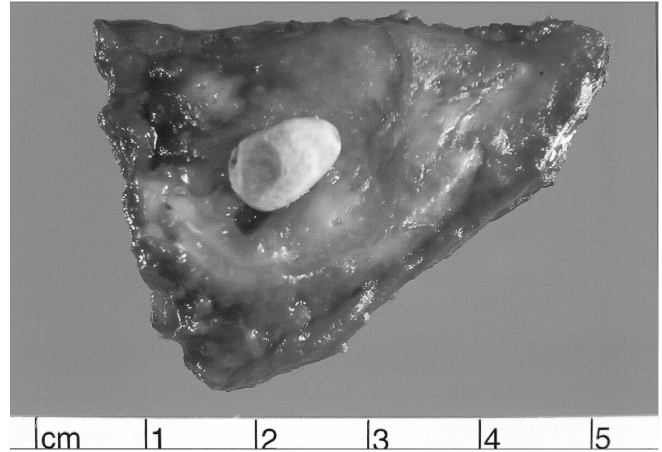
**Figure 1.** Computed tomography of the chest shows eccentric calcification of a soft tissue mass in the lower lobe of the right lung.

subdiaphragmatic abscess. His symptoms were treated successfully with oral antibiotics.

A repeat CT scan 2 months later demonstrated marked improvement of the pulmonary infiltrate, but the persistence of a calcified nodule on the surface of the diaphragm. Over the next 2 years, the patient developed episodic bouts of scant hemoptysis every 2 to 3 months that resolved spontaneously. Thirty-four months after his laparoscopic cholecystectomy, after an episode of self-limited hemoptysis, he underwent a surveillance CT scan that revealed a new 5x3-cm opacity in the posterobasal segment of his right lower lobe. Flexible bronchoscopy showed no endobronchial lesions. A presumptive diagnosis of pneumonia was made, and oral antibiotic therapy was initiated. An interval CT scan 2 months later demonstrated no change in the lesion. He was at this point referred to the thoracic surgery service. Further evaluation with a mediastinoscopy showed no evidence of malignancy. At the time of exploration, the right lower lobe was densely adherent to the diaphragm. To ensure an oncologic resection, a 2-cm section of diaphragm was resected. Frozen section showed no malignancy. The final pathology was returned as chronic pulmonary abscess and foreign body giant cell reaction to a gallstone. (**Figure 2**). The patient's postoperative course was uneventful.

## DISCUSSION

Laparoscopic cholecystectomy is now the standard of care for the surgical management of cholelithiasis. Gallbladder perforation occurs in 10% to 32% of patients who have



**Figure 2.** Transection of the gross lung specimen shows a gallstone encapsulated by surrounding fibrous reactive tissue.

laparoscopic cholecystectomies. Gallstone spillage is estimated to occur in 0.2% to 20% of cases with very few causing complications. A case review of 1130 consecutive laparoscopic cholecystectomies performed at 2 different institutions demonstrated a 0.3% complication rate from intraoperative stone spillage at 13-year follow-up.<sup>1</sup>

Complications from gallstone spillage vary from trocar-site wound infections to overt intraabdominal abscess as well as gynecological and intrathoracic complications.<sup>2</sup> Thoracic complications of retained gallstones with pleurobiliary and bronchobiliary fistulas were reported as early as 1955.<sup>3</sup> Some of these complications present in an insidious fashion several years after the cholecystectomy. The mean time to onset of complications is 6 months, but a case report exists of a gallstone-associated subphrenic abscess presenting 10 years after the cholecystectomy.<sup>4,5</sup>

Our case represents a complication of a spilled gallstone at the time of laparoscopic cholecystectomy that eroded through the right diaphragm and caused pneumonitis presenting as intermittent hemoptysis. Although our patient never had an overt intraabdominal abscess, clinically and by imaging, he had a prolonged right subdiaphragmatic inflammatory process that allowed the intrathoracic migration of the gallstone. Preventative measures included the use of a plastic bag when handling the gallbladder. If stone spillage occurs, a serious attempt to retrieve as many stones as possible with a larger forceps should be made followed by copious amounts of irrigation with a large bore suction catheter. This should be performed laparoscopically without conversion to an open procedure, as overall complication rate of stone spillage is 0.3%.

Before the advent of laparoscopic cholecystectomy, cho-

**Table 1.**  
Complications of Intrathoracic Gallstones

Investigator	Presenting Symptom	Onset	Calcified nodule on CXR	Location	Intra-abdominal Fluid Collection	Treatment
Schwegler 1975 <sup>6</sup>	Hemoptysis	36 m	Yes	RLL	Yes	RLL lobectomy
Lee 1993 <sup>7</sup>	Cholelithoptysis/massive hemoptysis	8 m	No	RLL	Yes	Laparotomy/bronchoscopy
Lee 1993 <sup>7</sup>	Cholelithoptysis	9 m	Yes	RLL	Yes	Lung wedge resection
Downie 1993 <sup>8</sup>	Cholelithoptysis/hemoptysis	12 m	No	RLL	Yes	Bronchoscopy/antibiotics
Thompson 1995 <sup>9</sup>	Cholelithoptysis/hemoptysis	NS	No	RLL	Yes	Bronchoscopy/antibiotics
Barnard 1995 <sup>10</sup>	Cholelithoptysis/hemoptysis	13 m	Yes	RML	Yes	Antibiotics/RML lobectomy
Breslin 1996 <sup>11</sup>	Cholelithoptysis/hemoptysis	2 m	No	RLL	No	Antibiotics
Chan 1998 <sup>12</sup>	Cholelithoptysis	6 m	No	RLL	Yes	Antibiotics
Baldo 1998 <sup>13</sup>	Cholelithoptysis/hemoptysis	60 m	No	RLL	No	Spontaneous resolution
Chopra 1999 <sup>14</sup>	Cholelithoptysis	30 m	No	RLL	Yes	Antibiotics
Werber 2003 <sup>15</sup>	Abscess with massive hemoptysis	6 m	Yes	RLL	Yes	RLL wedge resection
Fontaine 2004	Hemoptysis	34 m	No	RLL	Yes	RLL wedge resection

lelithoptysis and intrathoracic complications from gallstones were rare. Broncholithoptysis, “coughing up stones,” was classically due to calcified peribronchial lymph nodes that eroded through the bronchial wall. They were composed of calcium phosphate or calcium carbonate. These cases are usually associated with histoplasmosis or tuberculosis.

There are 11 case reports in the literature of gallstones in the thoracic cavity following cholecystectomy (**Table 1**). Nine cases presented as cholelithoptysis, and the latest one as massive hemoptysis from a gallstone-associated abscess.

Three possible routes of intrathoracic migration of gallstones exist: the lymphatic channels of Ranvier, congenital diaphragmatic defects, and transdiaphragmatic tracts that form from local infection/inflammation.

**CONCLUSION**

As seen in our case, prolonged chest symptoms, especially with findings in the RLL, following a laparoscopic cholecystectomy should raise the suspicion of intrathoracic gallstones. One must search for an intraabdominal collection and consider antibiotic treatment, percutaneous drainage, or laparotomy. Thoracotomy is rarely required and only indicated for obstructing pneumonia, refractive hemoptysis, or nodules of uncertain cause.

If stone spillage occurs during a laparoscopic cholecys-

tectomy, documentation in the chart would be valuable to clinicians following the patient, allowing them to have a high clinical suspicion when abdominal or thoracic symptoms occur.

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