# Robotic removal of spilled gallstones after laparoscopic cholecystectomy:
## Resolving a 7-year saga of chronic abdominal pain using new technology

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## Background

- Laparoscopic cholecystectomy has become the gold standard for acute calculous cholecystitis.
- Spillage of gallstones occurs from perforation of the gallbladder either before or during laparoscopic intervention.
- Can result in intra-abdominal abscess, fistula formation, and chronic pain syndrome
- Incidence of perforation is estimated to be 40%, incidence of gallstone spillage ranging as high as 16%.[1]
- Majority patients are asymptomatic from retained spilled gallstones, complication rates range from 0.3% - 19%.[2,3]. If symptomatic or complications will often ultimately require laparotomy for intervention.[3]
- To our knowledge, this is the first robotic approach for removal of dropped gallstones and intra-abdominal abscess

## Case Study

This is a 59-year old male, elective laparoscopic cholecystectomy by another outside hospital surgeon 4 years prior for biliary colic, complicated by a 7-year saga of chronic abdominal pain due spilled gallstones.

- **Perioperatively** no PMHx or PSHx, remarkable for severe cholecystitis and spillage of biliary contents that was reportedly suctioned and removed
- **Postoperatively**, had intermittent episodes of subjective fevers and epigastric/flank pain, which resulted in multiple inpatient and outpatient visits over 7 years.
- **Differential diagnosis** included spilled gallstones, pyogenic abscess and H. Pylori infection, malignancy, renal cysts, and was treated with multiple IR drainages, H. Pylori regimens, and outpatient work-ups
- He sought a second opinion with our clinic, where a diagnosis of chronic peri-hepatic abscess from dropped gallstones was made via MRI.

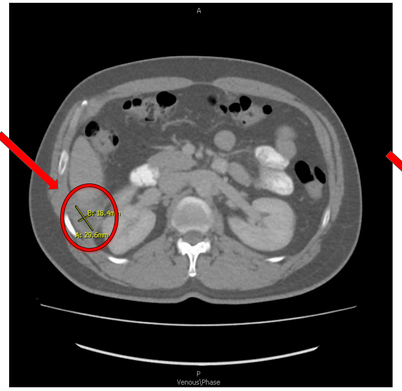


**Figure 1.** Equivocal CT-AP imaging, axial (1 year after surgery) red-arrow representative of infra-hepatic abscess vs. potential retained stones. Radiology at this time felt the findings were more consistent with abscess.



**Figure 2.** More convincing MRCP 7 years after surgery, that visualizes more clearly dropped gallstones. Red-arrow demarks the gallstones within the abscess cavity.

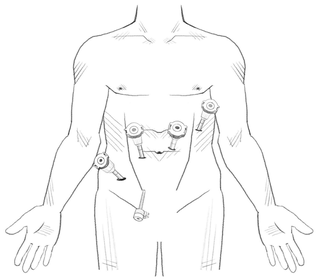


**Figure 3.** An illustration of robotic 8-mm port placements with arms 1, 2, 3, 4 with fenestrated bipolar, 30-degree camera, hook cautery, and tip-up grasper respectively, with a RLQ 5-mm port placement as an assistant port.

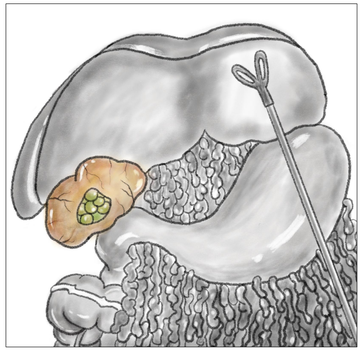


**Figure 4.** An illustration of the anatomically difficult, acute angle of Morison's pouch with abscess cavity.

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## Operative Approach

He was brought to the operating room for a robotic diagnostic laparoscopy. Using the Da Vinci Xi system, densely adherent and chronically inflamed tissue was encountered in the right upper quadrant (Figure 3). Extensive lysis of adhesions was performed and a window into the chronically inflamed Gerota's fascia at Morison's pouch was safely achieved, with multiple stones removed, and surgical drain left in place (Figure 4). The drain was removed and the patient has had complete resolution of abdominal pain at postoperative visit.

## Discussion

We present a case of a man with multiple risk factors for developing a complication for dropped gallstones, the take-home points include:

1. The surgeon must ensure minimal gallstone spillage, which may include use of copious irrigation or may be an additional 5-mm port placement to aid in manipulating surrounding organs and retrieval of stones.
2. MRI should have been considered early in the work-up of this man's pain syndrome, especially since the first postoperative CT scan was equivocal in determining the presence of spilled gallstones. MRI may be more sensitive to identifying non-calcified gallstones.[2]
3. We demonstrate the ability for a robotic approach to safely manage and address this difficult-to-reach anatomical space. Given the high incidence of requiring open approach for this complication, this provides an alternative to managing an infrahepatic abscess cavity.[3] Robotic approaches may be considered in the perioperative planning for these types of patients, with a low threshold to convert to laparotomy.

**References**

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**Disclosures**

The authors declare that they have no relevant or material financial interests that relate to the research described in this poster