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Postoperative Cholecystitis From Nathanson Liver Retractor During Robotic-Assisted Laparoscopic Partial Nephrectomy

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POSTOPERATIVE CHOLECYSTITIS FROM NATHANSON LIVER RETRACTOR DURING ROBOTIC-ASSISTED LAPAROSCOPIC PARTIAL NEPHRECTOMY

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Abstract

Introduction

Proper visualization of the surgical field during any procedure is one of the most imperative elements of surgery. The tools used to obtain this goal come with their own set of risks. This report describes a patient who developed postoperative acalculous cholecystitis (PAC) after use of a Nathan liver retractor. PAC is a rare complication of urologic surgery and is often more severe than acalculous cholecystitis (AC), leading to significant morbidity.

Case Description

A 66-year-old female underwent right-sided robotic-assisted laparoscopic partial nephrectomy for a 3.3 cm renal mass.

The patient was found to have a redundant liver. A Nathanson liver retractor was inserted under direct visualization in order to obtain adequate exposure of the right kidney.

The renal mass was successfully resected. Upon removal of the liver retractor, the retractor made contact with the gallbladder. No structural damage to the gallbladder or liver was observed.

The surgical sites were closed and a 19-French Blake drain was placed. On the second postoperative day, the patient developed right flank pain radiating to the epigastrium, anorexia, and vomiting. New bilious fluid was noted in the abdominal drain. Fluid total bilirubin was 20 times serum levels. Liver function tests were found to be mildly elevated.

A right upper quadrant ultrasound revealed cholecystitis and hepatic cysts. Cholescintigraphy was suggestive of common bile duct obstruction with no evidence of a bile leak. A computerized tomogram demonstrated gallbladder wall defects.

A general surgery consult was obtained. On postoperative day three, the patient continued to experience right upper quadrant pain, however fluid from the abdominal drain was no longer bilious. The patient underwent diagnostic laparoscopy with cholecystectomy and excision of hepatic cyst for ruptured hepatic cyst and cholecystitis. No bile leak was visualized.

Outcomes

The patient suffered from PAC and ruptured hepatic cyst due to use of the Nathanson liver retractor during urologic surgery. Complications from the use of a liver retractor have been documented previously, however we believe this is the first recorded case of liver retractor-induced PAC.

Conclusion

Liver retraction may be unavoidable during robotic-assisted laparoscopic right renal surgery. In this report we reviewed previous incidences PAC and liver retractor-induced injury following urologic surgery. Surgeons should be aware of potential complications from the use of surgical instruments.



Figure 1. Right Superiomedial Upper Pole Renal Mass



Figure 2. Nathanson Liver Retractor



Figure 3. Bilious Fluid from RLQ JP Drain

Figure 4. CT with Hepatic Cysts Adjacent to Gallbladder with Gallbladder wall defects



Case Details

- A 66-year-old female with no previous history of biliary disease underwent right-sided robotic-assisted laparoscopic partial nephrectomy with intraoperative ultrasound for a 3.3 cm right upper pole renal mass.
- Due to the superior, posteriomedial location of the mass, it was required that the kidney be mobilized in its entirety. The liver was found to be redundant and required retraction.
- A Nathanson liver retractor was inserted into the abdomen under direct visualization.
- At no point during the placement of the retractor did it make contact with the gallbladder or cause injury to the liver.
- After approximately 60 minutes of use, the Nathanson liver retractor was removed from the abdomen under direct visualization.
- Upon removal, the retractor made contact with the gallbladder.
- No structural damage to the gallbladder or liver was observed.
- The postoperative course progressed as expected the day of surgery and on postoperative day one. The patient tolerated a diet; renal function and hemoglobin were stable. Abdominal drain output was low, approximately 30 cc per 12 hours, and serosanguineous.
- On postoperative day two, the patient developed right flank pain radiating to the epigastrium, anorexia, and vomiting.
- Increased bilious green output was noted in the abdominal drain.
- The patient was made NPO and started on intravenous antibiotics.
- A liver function panel and fluid bilirubin were obtained from the JP drain. The JP fluid total bilirubin was elevated 20 times serum levels (20.8 mg/dL). Liver function was slightly elevated.
- General surgery was consulted and right upper quadrant ultrasound was obtained, which demonstrated multiple hepatic cysts adjacent to the gallbladder, gallbladder wall thickening and pericholecystic fluid, consistent with cholecystitis.
- Cholescintigraphy was suggestive of common bile duct obstruction with no evidence of bile leak.
- Computerized tomogram demonstrated gallbladder wall defects.
- On postoperative day three, the patient underwent diagnostic laparoscopy with cholecystectomy and excision of hepatic cysts by the general surgery team.
- The patient was found to have a ruptured hepatic cyst medial to the gallbladder and acute cholecystitis.
- The defect in the hepatic cyst was identified intraoperatively after mobilization of omentum covering the cyst.
- It is unclear if the defect was present preoperatively, or as a result of the exploratory laparotomy.
- During the procedure, biliary staining was observed on the right upper abdominal contents.
- Upon direct visualization of the gallbladder, no perforation or bile leak was identified. The gallbladder did appear to be inflamed and was thus removed.
- The patient tolerated the procedure well and the postoperative course was uneventful.
- Right upper quadrant pain resolved. Diet was advanced and she was discharged to home on postoperative day five from her initial partial nephrectomy.

Discussion

- Partial nephrectomy has been cited as an independent risk factor for perioperative complications in laparoscopic surgery for urological cancer.
- Complications from liver retraction have been cited as occurring in up to 25% of patients.
- Although prior instances of liver injury from Nathanson liver retractor have been documented, we believe this to be the first recorded case of liver retractor-induced postoperative acalculous cholecystitis.
- 23%-47% of cases of PAC are acalculous and occur in elderly males.
- Acalculous cholecystitis is associated with a poor prognosis as it has a high association with gangrene and perforation.
- The mortality rate in critically ill patients with PAC is estimated to be as high as 53%.
- Symptoms suspicious for PAC include fever, right upper quadrant pain, nausea, anorexia, and abdominal distention.
- Prompt diagnosis and treatment are necessary and work-up should not be delayed if PAC is suspected.

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