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Case Report

Management of Late Hemorrhage from Hepatic Artery Pseudoaneurysm after Gallbladder Cancer Surgery: A Case Report

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Abstract

Gallbladder cancer carries a poor prognosis, with surgical resection being the only curative option. However, complex anatomy can lead to serious postoperative complications.

We present a case of a 58-year-old male who developed a hepatic artery pseudoaneurysm following radical laparoscopic cholecystectomy for gallbladder cancer. The procedure was complicated by an aberrant bile duct injury, requiring hepaticoduodenostomy. He had a high-flow biliary fistula postoperatively. On postoperative day 7, he presented with hemorrhage and hemodynamic instability. CT angiography revealed a pseudoaneurysm of hepatic artery, and emergency surgical exploration was performed after failed coil embolization. The pseudoaneurysm was repaired, and segment 6 resection was performed for anastomotic dehiscence and necrosis. The patient recovered, received adjuvant chemotherapy, and experienced no further complications.

This case emphasizes the need for multidisciplinary management in complex biliary surgery and highlights the potential for rare but serious complications like pseudoaneurysms.

Keywords: Biliary Fistula, Hepaticojejunostomy, Hepatectomy, Bleeding, Cholecystectomy

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Gallbladder cancer is a rare malignancy with poor prognosis, and surgical resection remains the only curative treatment. However, the best surgical approach is still debated, particularly regarding the need for extended lymphadenectomy, hepatectomy, and complete extrahepatic bile duct resection.[1] Regardless of these debates, the complex anatomy of the biliary tree and its proximity to vital structures pose challenges, including the risk of pseudoaneurysm formation from surgical trauma, which can cause delayed and severe pulsatile bleeding. This case report depicts a rare presentation of early postoperative hemorrhage due to a hepatic artery pseudoaneurysm in a gallbladder cancer patient and highlights the role of combined management with interventional radiology and surgery. Institutional Re-

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view Board (IRB) approval was not required by IRB for the preparation of this report, but written informed consent was obtained from the patient for publication.

Case Report

A 58-year-old male with a history of subtotal gastrectomy with Billroth II anastomosis for peptic ulcer perforation presented with abdominal pain and 9 kg weight loss over 5 months. Imaging revealed a 25x23x24 mm gallbladder mass, connected to segment 6 of the liver, suggesting malignancy. MRI confirmed a gallbladder mass with fistulation to the duodenum and MRCP showed low insertion of the segment 6 bile duct into main bile duct (Fig. 1).

The patient underwent laparoscopic radical cholecystectomy with gallbladder bed resection and lymphadenectomy, complicated by segment 6 bile duct injury but no vascular damage. The injury was identified intraoperatively and reconstructed with a laparoscopic hepaticoduodenostomy. The right hepatic artery was located near the gallbladder bed and common bile duct with a short trunk of cystic artery which was ligated from the root by energy a device during cholecystectomy.

Bile fistula, 300 ml daily, was developed at the 3rd day of the surgery possible due to the tight hepaticoduodenostomy, it was planned to treat conservatively. On postoperative day 7, the patient presented with hemorrhagic drainage of 500 ml from the liver bed drain and he had lethargy. A CT angiography revealed a 4-centimeter pseudoaneurysm close to the right hepatic artery (Fig. 2). Coil embolization via mesenteric angiography was attempted but failed due to the artery's anatomical configuration.

Surgical exploration was performed emergently after failed embolization due to hypotension. Pseudoaneurysm of the hepatic artery was detected; and repaired with 5-0 polypropylene sutures after the excision of the pseudoaneurysm. Hepaticoduodenostomy leakage and additionally cystic duct leakage due to the necrosis of the remnant were seen; segment 6 resection with T tube placement to the cystic duct root was performed and duodenum orifice was controlled by 16 French Petzer drain placement.

In the early postoperative period, T-tube was non-functioning and high flow biliary fistula was treated by placing an external PTC catheter. Postoperative follow-up showed no bleeding or cholangitis recurrence. Histopathology confirmed poorly differentiated adenosquamous carcinoma with perifibromuscular connective tissue invasion but no lymph node metastasis (pT2bN0, AJCC 2017). Patient was discharged at the 4th week of the surgery and started the adjuvant chemotherapy at the 8th week of the surgery. The patient had received adjuvant chemotherapy without any complications and remains free of late surgical complications and recurrence.

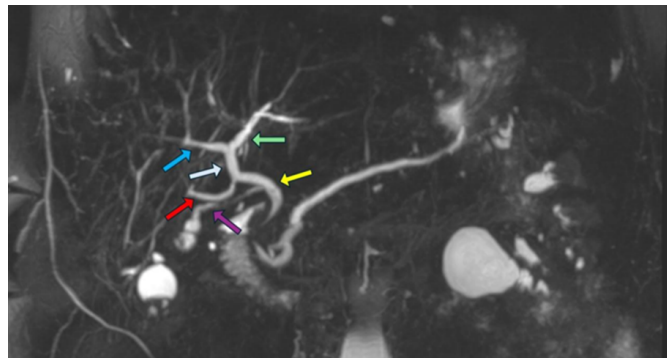

Figure 1. Digital reconstruction of Preoperative Magnetic Resonance Cholangiopancreatography Image.

Red Line: Bile duct of Segment 6 of liver. (Note the low insertion at common hepatic duct level). Blue Line: Right lobe bile duct. Green line: Left lobe bile duct. White Line: Common hepatic duct. Purple line: Cystic duct. Yellow line: Common bile duct.

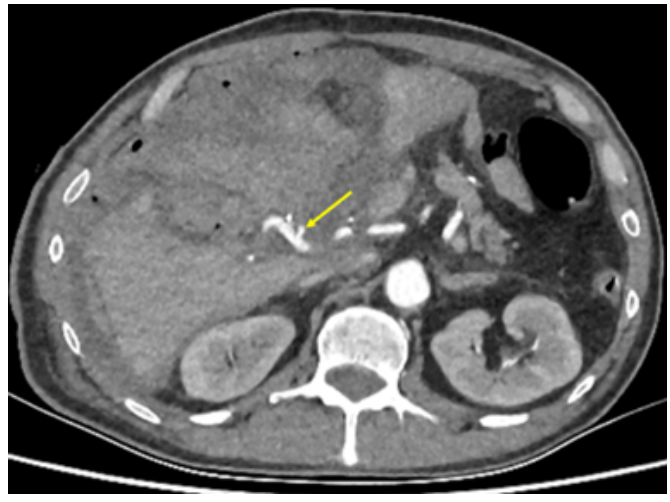

Figure 2. Hepatic artery pseudoaneurysm which caused post operative bleeding. (Shown in yellow arrow).

Discussion

Pseudoaneurysm is a false arterial dilatation caused by trauma, where the false lumen does not connect to the true lumen. Postoperative pseudoaneurysm bleeding is typically pulsatile, intermittent, and delayed. Most common reason for the visceral pseudoaneurysm is iatrogenic trauma of the artery; particularly after laparoscopic dissection by energy devices, as seen in this case involving a hepatic artery pseudoaneurysm.

Hepatic artery pseudoaneurysms are rare and can pose significant challenges in diagnosis and management. Data on bleeding and reintervention rates in gallbladder cancer

surgery are limited; but Arteaga et al. and Frankhauser et al. reported acute bleeding mortality rates of 3–4% and re-intervention rates of 3–5% in hepatopancreatobiliary surgery.[2,3] Dou et al. found lower blood loss in laparoscopic gallbladder cancer surgery compared to conventional approaches, consistent with our institutional experience.[4]

The laparoscopic approach was chosen for its minimally invasive benefits, including reduced recovery time and postoperative pain. However, the complex biliary anatomy, especially with advanced disease or anatomical variations, increases the risk of bile duct injury.[5,6] Limited visualization and instrument maneuverability in laparoscopy can delay injury recognition and management.[7] In this case, the Segment 6 bile duct drained directly into the common hepatic duct, running parallel to the cystic duct (Fig. 1). Despite these challenges, the procedure was successfully completed laparoscopically. At our institution, most hepatopancreatobiliary surgeries are performed laparoscopically, with success rates comparable to open procedures, allowing for precise anatomical assessment and management.

The pseudoaneurysm underscores the complexity of biliary surgery, especially with prior anatomical distortion.[8] The right hepatic artery's proximity to the gallbladder bed and common bile duct contributed to its formation. Management required a multidisciplinary approach. Coil embolization failed due to challenges in catheterizing the artery, reflecting the difficulties of endovascular procedures in complex vascular anatomy.[9] Persistent bleeding necessitated surgical exploration and repair.

The surgery was complicated by adhesions, bilioenteric anastomosis avulsion, and Segment 6 necrosis. Hemostasis and biliary drainage required meticulous dissection and reconstruction. Temporary T-tube and a PTC catheter drainage managed the biliary fistula, allowing the patient to start adjuvant chemotherapy within the optimal 6 to 8 weeks. Despite no lymph node metastasis, the diagnosis of adenosquamous carcinoma necessitates adjuvant therapy and long-term monitoring due to its aggressive nature.[10]

Conclusion

This case highlights the importance of meticulous surgical technique and careful patient selection in managing gallbladder cancer. The development of a pseudoaneurysm and the need for additional surgery emphasize the risk of serious complications in advanced gallbladder disease. A successful outcome was achieved through a multidisciplinary approach, combining surgery, radiology, and psychological care. Despite initial complications and a second, more extensive surgery, the patient recovered well, underscoring the value of comprehensive patient care.

Disclosures

Informed consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

Conflict of Interest: None declared.

Financial Disclosure: None.

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