

Upper gastrointestinal bleeding secondary to right hepatic artery pseudoaneurysm following open extended cholecystectomy with segmental resection of transverse colon: A case report

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Hepatic artery pseudoaneurysm (HAP) is an infrequent but life-threatening complication after extended cholecystectomy, which mandates early recognition. We present a case of a 54-year-old female who presented with repeated episodes of upper gastrointestinal bleeding (UGIB) after extended cholecystectomy and was evaluated with endoscopy and CECT abdomen and pelvis with no clue for diagnosis. Finally, conventional angiography was able to identify the cause of UGIB as a right hepatic artery pseudoaneurysm, and embolization was done, following which the patient was stable and discharged. This case highlights the importance of having a high index of suspicion for HAP when initial investigations are negative.

Keywords: Extended cholecystectomy, Gastrointestinal bleeding, Hepatic artery, Pseudoaneurysm

Introduction

Upper gastrointestinal bleeding (UGIB) is blood loss originating proximal to the ligament of Treitz, in the esophagus, stomach, or duodenum. The most common manifestation of UGIB is melena or hematemesis. It is a potentially life-threatening condition with a wide range of etiologies, including peptic ulcer disease, variceal hemorrhage, and malignancies.¹ However, upper GI bleeding secondary to a hepatic artery pseudoaneurysm (HAP) is a rare occurrence.² It usually results from procedures such as liver biopsy, transhepatic biliary drainage, cholecystectomy, and hepatectomy. The right hepatic artery is particularly vulnerable due to its proximity to the gallbladder fossa, making it susceptible to inadvertent injury during an extensive hepatobiliary procedure.³ HAP has rarely been reported following open extended cholecystectomy. We report a case of a 54-year-old female who presented with upper gastrointestinal bleeding due to a right hepatic artery pseudoaneurysm following open extended cholecystectomy with segmental resection of the transverse colon. It emphasizes the importance of early recognition, comprehensive diagnostic evaluation, and the critical role of endovascular interventions in improving patient outcomes.

Case presentation

A 54-year-old female, a non-smoker, non-alcoholic, with no known comorbidity initially presented to an outside institution one and half month ago with upper abdominal pain in the absence of fever, jaundice, or melena. Her CECT of the abdomen and pelvis demonstrated features consistent with carcinoma of the gallbladder with locoregional infiltration of the liver and involvement of the hepatic flexure of the colon (Figure 1).

Article History

Received on - 2026 Feb 22

Accepted on - 2026 May 15

Online Access



DOI: 10.60086/

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Citation: Pradhan S, Shah GK, Pandit R, Maharjan N, Singh Bhandari R. Upper gastrointestinal bleeding secondary to right hepatic artery pseudoaneurysm following open extended cholecystectomy with segmental resection of transverse colon: A case report. JNSG 2026;1(1):23-26.

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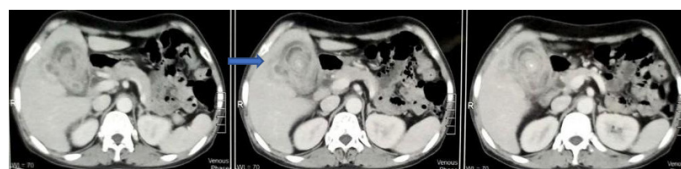


Figure 1: CECT abdomen and pelvis showing gallbladder calculus along with heterogeneous enhancing diffuse wall thickening (marked by arrow) with fat stranding with locoregional infiltration of liver and abutting hepatic flexure of colon.

She subsequently underwent an open extended cholecystectomy with segmental resection of the transverse colon in the same institute. Her postoperative period was uneventful apart from a superficial surgical site infection, which was managed

with dressing and antibiotics, and she was discharged on postoperative day 12.

One week prior to her referral to our institution, she presented to an outside emergency department with multiple episodes of hematemesis. She was admitted to the intensive care unit, transfused two units of packed red cells for a hemoglobin of 7 gm/dl. She was evaluated with ultrasound of abdomen and pelvis which was normal. Upper GI endoscopy revealed superficial gastric ulcers with mild duodenitis (Figure 2). She was commenced on a triple regimen and discharged after six days. However, she was readmitted the following day with recurrent hematemesis, melena, and syncope. Repeat CECT abdomen and pelvis demonstrated post-cholecystectomy changes with a few enlarged periportal and peri gastric lymph nodes but failed to identify a bleeding source (Figure 3). She was subsequently referred to our hospital.

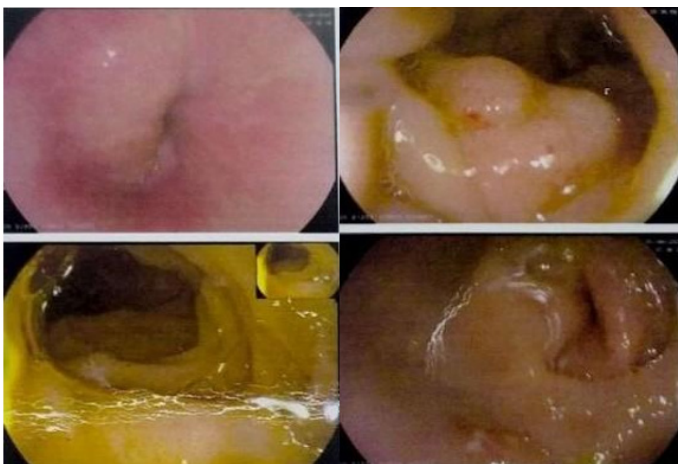


Figure 2: Upper GI endoscopy showing erythematous patches with a few superficial ulcers at the antrum. Also seen are erythematous patches over D1.



Figure 3: CECT abdomen and pelvis showing post-cholecystectomy status with a few enlarged periportal and peri gastric lymph nodes.

On arrival, the patient was hemodynamically stable with only scanty melena and a static hemoglobin level, and was managed conservatively. On the third night of admission, she developed hematemesis with hemodynamic compromise requiring vasopressor support. Her Hb level further dropped to 6.5 necessitating transfusion with one unit of packed red cells. Conventional angiography performed the following day showed a pseudoaneurysm of the right hepatic artery (Figure 4A), which was successfully embolized using a combination of coils, glue, and lipoidal based agent. Check angiography confirmed complete occlusion with no residual contrast flow into the pseudoaneurysm (Figure 4B).



Figure 4: Angiography of the right hepatic artery demonstrating a pseudoaneurysm (marked by arrow) before (A) and after embolization (B).

Following embolization, the patient was monitored in the Intensive Care Unit. Hemodynamic stability was maintained without vasopressor support, hemoglobin remained stable, and she experiences only minor further episodes of melena without hematemesis. She was stepped down to the general ward after three days and was discharged following clinical recovery with no further evidence of UGIB.

Discussion

A pseudoaneurysm is an abnormal dilation resulting from a breach in the arterial wall, in which blood extravasates through the intima

and media and is confined by the surrounding tissue or thrombus. Among visceral artery pseudoaneurysms, the splenic artery is most commonly affected.⁴ Hepatic artery pseudoaneurysm, while rare, constitutes a potentially fatal entity that warrants prompt recognition.

This case report demonstrates a case of right hepatic artery pseudoaneurysm developed after an open extended cholecystectomy likely resulted from iatrogenic injury to the right hepatic artery, presenting as upper gastrointestinal bleeding. The predisposing factors for pseudoaneurysm formation during hepatobiliary surgery include mechanical or thermal arterial injury, bile duct injury with bile leak, local infection, or difficult dissection in the setting of severe inflammation or anatomical variation.⁵ In this patient, the extended cholecystectomy with segmental resection of the transverse colon for presumed gallbladder carcinoma likely placed the right hepatic artery at risk due to its close anatomical proximity to the operative field. Iatrogenic injury during dissection, compounded by bile leakage and subsequent local inflammation, may have contributed to weakening of the arterial wall, ultimately resulting in pseudoaneurysm formation. Such vascular injuries, although under-recognized, are not uncommon in the context of cholecystectomy. The true prevalence of hepatic artery injury after cholecystectomy remains uncertain because many cases are asymptomatic; however, an autopsy series demonstrated hepatic artery injury in about 7% of patients who had undergone open cholecystectomy.⁶

Hepatic artery pseudoaneurysms mostly go undetected, but when symptomatic, hepatic artery pseudoaneurysms most often present with hemobilia, abdominal pain, or jaundice. Only 22% of the patients exhibit the classic Quincke's triad of biliary colic, jaundice, and gastrointestinal bleeding.² The patient presented with UGIB one week before her final admission, which was managed conservatively based on endoscopic findings of superficial gastric ulcers and mild duodenitis. These findings, however, did not explain her recurrent bleeding episodes. This scenario underscores the diagnostic dilemma: conventional upper gastrointestinal endoscopy can sometimes fail to detect a bleeding source when the etiology is vascular in origin, such as a pseudoaneurysm. Moreover, while CECT was performed, it was unable to localize the bleeding source limitation that is recognized in cases of intermittent hemorrhage or small vascular lesions. Mesenteric angiography is the gold standard for diagnosing visceral pseudoaneurysms.⁷ The same diagnostic method was able to detect right HAP in our case, also indicating the requirement of a high index of suspicion for vascular complications, especially when clinical deterioration occurs after an initial negative workup.

Several therapeutic approaches are used in the management of pseudoaneurysms, with endovascular treatment being considered the first line.⁸ Trans arterial embolization is most frequently used with coils, n-butyl cyanoacrylate, lipiodol, or their combinations. Covered stents are used when endovascular approaches are not feasible because of difficult anatomy and when preservation of the parent artery is essential. Other techniques, such as USG-guided thrombin injection or compression, have a limited role in visceral pseudoaneurysms. Surgery is reserved for hemodynamically unstable patients or when endovascular approaches have failed.

The pseudoaneurysm in our case was successfully embolized using a combination of coils, glue, and a lipiodol-based agent. The choice of multiple embolic agents can enhance the likelihood of complete occlusion while preserving the perfusion of the adjacent liver parenchyma. The patient improved well after embolization, with stable vital signs, hemoglobin maintained, and no further bleeding, showing how effective this minimally invasive treatment can be. Several studies further reinforce the role of trans arterial embolization as a safe and effective treatment modality for hepatic aneurysms.^{9,10}

Conclusion

Hepatic artery pseudoaneurysm should be considered in any patient presenting with recurrent UGIB following major hepatobiliary surgery, particularly when initial endoscopy and cross-sectional imaging are unrevealing. Early CT angiography and a low threshold for conventional angiography are essential to avoid diagnostic delay and facilitate timely endovascular intervention.

Conflict of Interest: None

Funding: None

Declaration: None

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