



## Ischemic Stricture of the Common Bile Duct Following Embolization of the Proper Hepatic Artery: A Case Report

Achiri Inass\*, Sahel Yassine and Mouaqit Ouadii

Department General Surgery, Hassan II University Hospital, Fès, Morocco

### Abstract

Bile duct injuries represent a serious and challenging complication that could be caused by various mechanisms including inflammatory, tumoral, traumatic, ischemic or iatrogenic causes. These bile duct disruptions lead to strictures and stenosis of the common bile duct leading to redundant jaundice and recurrent episodes of cholangitis. We present in this article the case of a 63-year-old male patient that was hospitalized in our unit of general surgery at the Hassan 2 university hospital in Fez with a history of cholangitis due to an aneurysm of the proper hepatic artery fistulized into the biliary tract which was embolized in 2021. Since then, the patient was admitted a few times due to recurring episodes of cholangitis which were linked to an ischemic cicatricial stricture of the common bile duct following embolization of the proper hepatic artery. Given the diagnosis, the patient underwent a surgery which consisted of a hepaticojejunostomy on a Roux-en-Y limb (RYHJ). The article highlights the efficacy of surgery in the treatment of these bile duct injuries, while highlighting diagnostic challenges and the need for proper knowledge of the severe biliary complications after hepatic artery embolization resulting in common bile duct damage.

**Keywords:** Common bile duct stenosis; Cholangitis; Hepaticojejunostomy; Hepatic artery embolization

### Introduction

Ischemic stricture of the main bile duct is a rare but serious complication, most often occurring in the context of hepatic vascular compromise. Among iatrogenic causes, there is the embolization of the proper hepatic artery—a procedure commonly employed in the management of hepatic conditions such as hemorrhage, tumors, postoperative complications or aneurysms—leading to secondary biliary ischemia. Since the bile ducts rely almost exclusively on the arterial blood supply from the hepatic artery, any disruption in this vascularization can compromise biliary integrity and result in potentially severe strictures. This article discusses the rare case of a 63-year-old patient suffering from ischemic stenosis of the common bile duct following an embolization of the proper hepatic artery.

### Clinical Case

The patient is 63 years old. With no notable pathological history.

The history of the disease dates back to 2021 where the patient was admitted for an episode of cholangitis consisting in fever, icterus and right upper quadrant pain, due to which he underwent an abdominal CT angiogram revealing an aneurysm of the proper hepatic artery fistulized in the biliary tract complicated by intrahepatic bile duct dilatation and haemobilia.

The patient then benefited from an embolization of the proper hepatic artery during which a microcatheter was first advanced into the gastroduodenal arteries and the middle pancreatic artery, which were embolized with coils. This was followed by the injection of two vials of Onyx 18 into the hepatic artery, and subsequent occlusion of the hepatic artery with coils (Figure 1).

The patient did not develop any immediate postoperative complications and was therefore discharged.

In the following years, the patient was admitted twice for cholangitis, the first one was in 2023 where the symptoms spontaneously resolved, and the second time was in June 2025 where he

### OPEN ACCESS

#### \*Correspondence:

Achiri Inass, Department General Surgery, Hassan II University Hospital, Fès, Morocco,  
E-mail: inass.achiri@usmba.ac.ma

Received Date: 31 Oct 2025

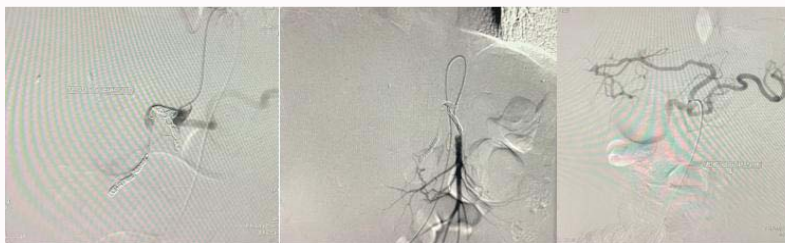
Accepted Date: 19 Nov 2025

Published Date: 21 Nov 2025

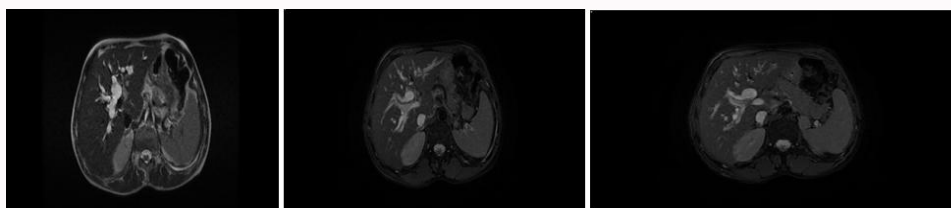
#### Citation:

Inass A, Yassine S, Ouadii M. Ischemic Stricture of the Common Bile Duct Following Embolization of the Proper Hepatic Artery: A Case Report. *World J Surg Surgical Res.* 2025; 8: 1609.

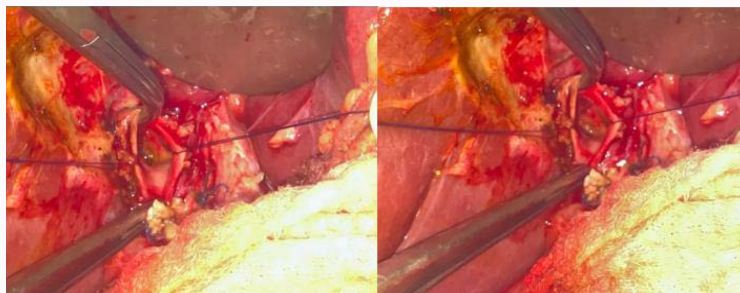
**Copyright** © 2025 Achiri Inass. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



**Figures 1:** Embolization images showing the progression of the microcatheter into the celiac trunk to embolize the proper hepatic artery with coils.



**Figure 2:** Abdominal MRI showing a dilation of the intrahepatic bile ducts upstream of an ischemic fibrotic stricture of the main bile duct, classified as Bismuth type II.



**Figure 3:** Intraoperative image showing the confluence area after opening the common bile duct.

underwent an ultrasound and an abdominal CT scan, which showed a dilation of the main bile duct measuring 17 mm upstream of 2 distal common bile duct stones.

An Endoscopic Retrograde Cholangiopancreatography (ERCP) with sphincterotomy was performed, allowing for balloon extraction of two stones; however, attempts to cannulate the common bile duct and intrahepatic bile ducts were unsuccessful.

Following this failed ERCP, the patient was maintained on dual antibiotic therapy with a third-generation cephalosporin and metronidazole, and a MRCP was performed, which showed significant dilatation of the intrahepatic bile ducts upstream of an ischemic fibrotic stricture of the main bile duct, classified as Bismuth type II, with a non-obstructive stasis stone located proximally to the stricture (Figure 2).

Upon this diagnosis, the patient was referred to our department of surgery for treatment.

#### On clinical examination

The patient was conscious, normotensive, afebrile, anicteric.

The abdominal exam showed no signs of hepatocellular dysfunction nor tenderness or guarding in projection of the right upper quadrant.

Biological tests conducted upon admission showed the following

results: HB 13.3, WBC 6100, CRP 1, TB 5, DB 3, GGT 220, ALP 145, AST/ ALT were normal.

The treatment plan consisted in a hepaticojejunostomy on a Roux-en-Y limb (RYHJ) which took place as follows:

- In supine position, under general anesthesia, a right subcostal laparotomy was performed.
- Exploration of the abdominal cavity:
- Careful dissection of the hepatic pedicle was carried out.
- Mobilization of the common bile duct.
- Opening of the common bile duct at its choledochal portion.
- Puncture and aspiration with bile sampling.
- Ligation and closure of the distal end of the transected common bile duct.
- Preparation of the jejunal loop:
- Isolation of the jejunal loop approximately 40cm from the Treitz ligament.
- Transection of the jejunum using GIA stapler.
- Bilio-digestive anastomosis:
- End-to-side biliary-jejunal anastomosis performed with

continuous suture using 4/0 Vicryl.

- Jejunum-jejunal anastomosis: side-to-side, performed with a continuous suture using 4/0 Vicryl.
- Drainage:
- Placement of a drain near the bilio-digestive anastomosis.
- Drain secured to the skin.
- Abdominal closure (Figure 3).

## Discussion

Ischemic common bile duct stricture caused by embolization of the hepatic artery is a recognized complication that results from the interruption of the arterial blood supply to the bile ducts, leading to ischemic injury. The bile ducts receive their blood supply primarily from branches of the hepatic artery, and embolization procedures targeting the hepatic artery, due to aneurysm of the proper hepatic artery fistulized in the biliary tract in our case. This ischemia can cause bile duct necrosis, strictures, and subsequent complications like bile duct dilatation, bile retention, or biloma formation [1].

The frequency of ischemic bile duct strictures following hepatic artery embolization varies but has been reported to be between approximately 0.5% to 7.8%, depending on the extent and site of embolization. Proximal embolization involving the main hepatic artery or its primary branches poses a higher risk compared to embolization of more distal, segmental arteries. Studies indicate that bile duct injury occurs in about 3% to 7% of patients undergoing embolization procedures, with risks increasing with repeated or proximal embolization. The severity and risk of strictures also correlate with the degree of arterial compromise and ischemia caused by the embolization [2,3].

The clinical signs of ischemic stricture of the common bile duct primarily reflect bile duct obstruction and impaired bile flow caused by ischemic injury [4]. Common symptoms include jaundice, pruritus, pale or clay-colored stools, and dark urine. These result from buildup of bilirubin and impaired bile excretion. Patients may also experience abdominal pain, particularly in the upper right quadrant, and symptoms of cholangitis such as fever, chills, and abdominal tenderness, indicating bile duct infection. Other possible signs may include nausea, vomiting, malaise, and weight loss. In some cases, recurrent episodes of cholangitis, which was the case of our patient, or biliary sepsis [5].

Diagnosis of ischemic stricture of the common bile duct involves a combination of clinical evaluation, laboratory tests, and imaging studies. Liver function tests typically show elevated conjugated bilirubin, alkaline phosphatase, and gamma-glutamyl transferase levels. Imaging modalities play a crucial role: magnetic resonance cholangiopancreatography (MRCP) is highly sensitive and non-invasive, useful for visualizing the site and extent of the stricture. Endoscopic retrograde cholangiopancreatography (ERCP) is the gold

standard, allowing for direct visualization, tissue sampling for biopsy to rule out malignancy, and therapeutic interventions. Additional techniques like endoscopic ultrasound (EUS) combined with ERCP enhance diagnostic accuracy. Histological assessment may be necessary to exclude malignant causes and confirm the ischemic nature of the stricture [6].

Treatment is generally tailored based on the complexity and the patient's clinical status. Endoscopic management is the first-line approach, involving balloon dilatation and stent placement to relieve obstruction. Long-term follow-up is necessary to monitor for stricture resolution or recurrence. In refractory or complex cases, percutaneous radiologic interventions or surgery may be required. Recent studies emphasize the importance of minimally invasive approaches with endoscopic therapy as the mainstay, reserving surgery for cases unresponsive to other treatments. Emerging therapies include radiofrequency ablation and regenerative treatments, though these are still under investigation [7,8].

## Conclusion

Ischemic stricture of the common bile duct is a rare but serious complication that can follow hepatic artery embolization, particularly in cases involving proximal arterial branches. This case highlights the diagnostic complexity and clinical challenges associated with such injuries, which often present with recurrent cholangitis. Imaging modalities like MRCP and ERCP play a crucial role in diagnosis, but definitive treatment—especially in cases of complex or refractory strictures—often requires surgical intervention. In this case, a hepaticojejunostomy on a Roux-en-Y limb proved to be an effective solution, reinforcing the value of surgical management in select cases where endoscopic approaches fail.

## References

1. Guo J, Zhang X, Kong J. Prediction of bile duct injury after transarterial chemoembolization for hepatocellular carcinoma: Model establishment and verification. *Front Oncol.* 2022;16:12:973045.
2. Xu H, Yu X, Hu J. The Risk Assessment and Clinical Research of Bile Duct Injury After Transcatheter Arterial Chemoembolization for Hepatocellular Carcinoma. *Cancer Manag Res.* 2021;13:5039-52.
3. Lu H, Liang B, Xia X, Zheng C. Predictors and risk factors of bile duct injury after transcatheter arterial chemoembolization for hepatocellular carcinoma. *BMC Cancer.* 2024;24:1085.
4. Jackson W. Ischemic Cholangiopathy. 2025.
5. <https://emedicine.medscape.com/article/186850-clinical?form=fpf>
6. <https://www.ncbi.nlm.nih.gov/books/NBK559217/>
7. <https://emedicine.medscape.com/article/186850-treatment?form=fpf>
8. Bofill A, Cárdenas A. A practical approach to the endoscopic management of biliary strictures after liver transplantation. *Ann Hepatol.* 2024;29(2):101186.