

## Track Seeding from Percutaneous Biliary Drainage in a Case of Cholangiocarcinoma: Impact on Transplant Eligibility

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### To the Editor,

Cholangiocarcinoma (CCA) carries poor prognosis, with a 5-year survival of less than 20% without treatment. Until recently, liver resection was the only curative approach for intrahepatic (iCCA) and perihilar (pCCA) tumors, offering a 5-year survival rate of 25–40% [1], but most patients are ineligible due to advanced disease. Liver transplantation (LTX) for pCCA has been reconsidered after the promising results provided by the Mayo Clinic group, which implemented a neoadjuvant protocol comprising multimodal chemoradiotherapy for LTX candidates [2]. Since then, multiple studies have validated these results with a 5-year survival of over 60% [3]. Despite being considered a standard treatment for pCCA by the Organ Procurement and Transplant Network (OPTN), LTX is limited due to shortage of potential donors. This letter highlights the occurrence of peritoneal seeding after percutaneous biliary drainage in a case of pCCA, excluding LTX and impacting the definitive treatment.

A 38-year-old man presented with obstructive jaundice, weight loss, elevated CA 19–9 over 2000 U/ml, and a baseline total bilirubin of 14.2 mg/dl. AFP was normal. MRCP

revealed a dominant stricture involving the confluence of right and left hepatic ducts with upstream biliary dilatation (Fig. 1) and an ill-defined 2.7 × 2.0 cm enhancing mass (Fig. 1) concerning for cholangiocarcinoma. ERCP confirmed Bismuth type 4 perihilar stricture with malignant cytology. A plastic stent was placed to drain the right hepatic lobe. The patient was not a candidate for resection due to locally advanced disease however was eligible for LTX and was placed on the Mayo Clinic chemoradiation protocol. Despite endoscopic biliary drainage (EBD), his bilirubin remained at 7.6 mg/dl. Bilateral percutaneous biliary drains were then placed (Fig. 2), reducing bilirubin to 1.5 mg/dl and facilitating his eligibility for chemoradiation.

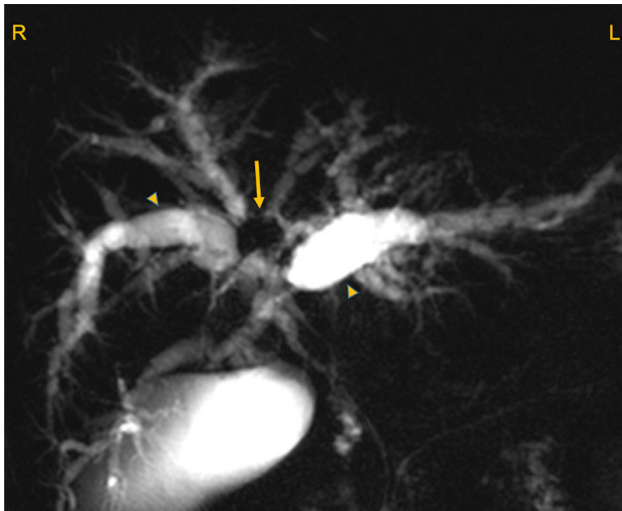
While awaiting LTX, the patient underwent multiple biliary drain exchanges at close intervals due to retraction and leakage, followed by routine exchange two months later. Fourteen weeks after initial biliary drain placement, he developed gangrenous cholecystitis, requiring an open cholecystectomy. During surgery, numerous perihepatic adhesions and at least four peritoneal nodules were found and biopsied, confirming metastatic adenocarcinoma. Retrospective MRI evaluation, performed just before surgery, revealed a metastatic deposit along the catheter track (Fig. 3). The patient was delisted from the transplant list and transitioned to palliative care. He is stable and alive 6 months after bilateral metal stent placement and biliary drain removal.

Decompression of the biliary system to reduce the bilirubin levels is critical for administering chemotherapy and enhancing surgical outcomes [1]. EBD is preferred over percutaneous transhepatic drainage (PTBD) for long-term outcomes due to lower rates of seeding metastasis, despite a higher procedural complication rate. A recent RCT was terminated early in favor of EBD due to a higher all-cause mortality rate in the PTBD group [4]. The incidence of seeding metastasis among patients undergoing PTBD ranges

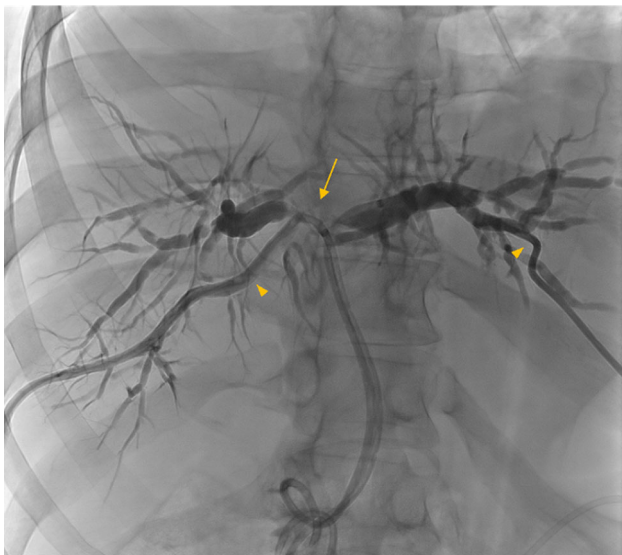
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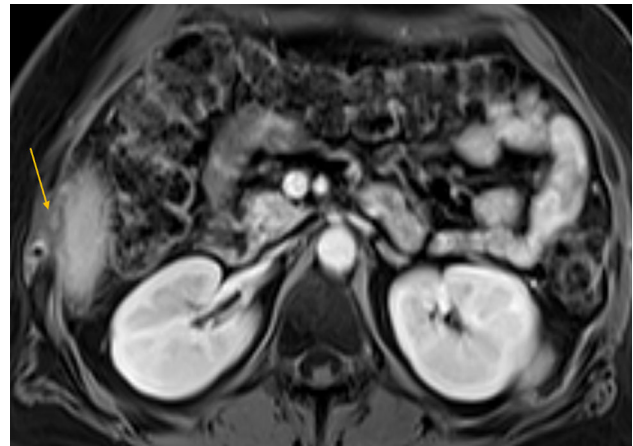
**Fig. 1** MRCP demonstrating dilatation of the right and left hepatic ducts (arrowheads) due to the perihilar mass (arrow)



**Fig. 2** Cholangiogram demonstrating the perihilar stricture (arrow) with left and right internal and external biliary drains (arrowheads)

from 2.6 to 6.3% [5], with catheter insertion potentially leading to cancer cell dissemination along the track facilitating metastasis. While the UNOS and institution-specific guidelines for LTX in CCA do not allow transperitoneal biopsy while awaiting LTX due to the risk of tumor track seeding, there are no specific recommendations regarding the placement of biliary drains for decompression.

This letter emphasizes that PTBD for pCCA poses a risk of seeding metastasis with potentially detrimental outcomes, advocating for EBD as the preferred biliary decompression method. In alignment with the University of Pittsburgh Medical Center LTX policy, which excludes patients with a history of prior open biopsy, we recommend



**Fig. 3** Axial T1 post-contrast MRI image demonstrates an enhancing perihepatic nodule along the catheter track (arrow) consistent with track seeding

increased caution and scrutiny when considering biliary drains in these cases, as they may adversely affect future LTX eligibility. Additionally, we suggest extending the exclusion criteria to encompass prior PTBD.

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**Declarations**

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical approval and consent** For this type of study, formal consent is not required.

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