

# Haemorrhagic and Non-Haemorrhagic Complications of Percutaneous Transhepatic Biliary Drainage (PTBD): A pictorial review

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## Objectives:

The purpose of this study is to evaluate the spectrum of complications after PTBD insertion.

## Materials and Methods:

A retrospective review of records of all adult patients who had new PTBD insertion done at the Department of Radiology in PYNEH from 1<sup>st</sup> July 2019 to 31<sup>st</sup> June 2024.

## Materials and Methods:

514 patients (average age 71; range 35-98) had new PTBD insertions performed in the study period.

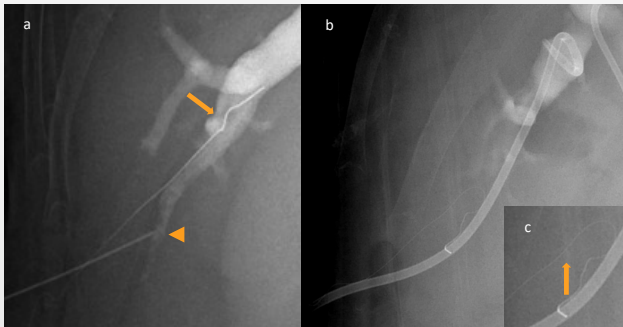
Indications include malignant biliary obstructions, bile duct stone, bile duct stricture and bile leak.

Out of the 514 cases of new PTBD insertion, 489 cases (95.1%; Left PTBD: 241 Right PTBD: 248) were technically successful and 25 cases were failed (4.9%). 135 (26.3%) cases have non dilated intrahepatic ducts which contribute 21 cases of failed PTBD insertions. The technically successful rate for new PTBD insertions with dilated intrahepatic ducts and non dilated intrahepatic ducts are 98.9% and 84.4% respectively.

Over the study period of 5 years, 12 major complications (2.3%) were observed. These include hepatic artery pseudoaneurysm, portal vein injury, retained foreign body, bile leak and biliary sepsis. The overall complication rate of non-dilated intrahepatic ducts group is not higher than the dilated intrahepatic ducts group.

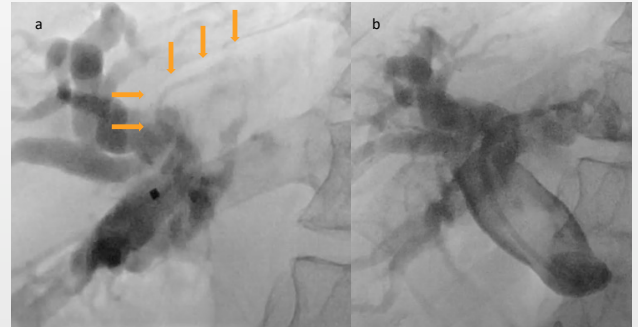
## Retained broken PTBD wire

Buckling of tip of a 0.018" guidewire noted (*Figure a, arrow*) during manipulation. The wire fractured upon removal with the distal part retained and the proximal part elongated. The more distal part of the IHD was punctured with another needle (*Figure a, arrowhead*). Retrieval of the fractured wire was performed, with part of the wire remained retained in the liver parenchyma after several attempts (*Figure c, arrow*).



## False tract to portal vein

After insertion of the introducer set, contrast injection showed opacification of portal vein (*Figure a, arrow*) instead of the biliary system, suggesting creation of false tract. Tract embolization with Gelfoam pledgets was performed. Cholangiogram after subsequent successful PTBD insertion showed filling defects along the dilated common bile duct, indicating haemobilia (*Figure b*).



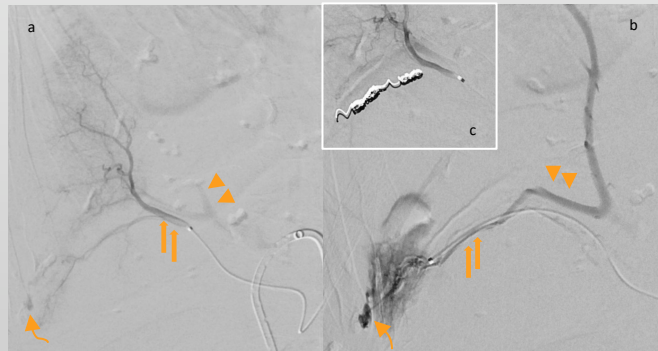
## Hepatic artery pseudoaneurysm

Case of post-ERCP bile leak. PTBD was performed for biliary diversion. Patient developed haemobilia 1 month after the procedure. Right hepatic artery angiogram showed contrast flow into the biliary tract with extravasation into the peritoneum (*Figure a, arrow*). A pseudoaneurysm (*Figure b, arrow*) was noted 3-4mm cranial to the right PTBD tract after selective angiogram. Successful coil embolization of the pseudoaneurysm was performed (*Figure c*).



## Arterioportal fistula formation

Haemoperitoneum after PTBD insertion. Angiogram showed contrast extravasation (*curved arrow*) from an inferior branch of right hepatic artery, with arterioportal fistula (APF) formation (*Figure a, b; hepatic artery branch: arrow; portal vein branch: arrowhead*). Coil embolization of the culprit artery was performed, with resolved contrast extravasation and angiographic improvement of the APF (*Figure c*).



## Conclusion:

The overall complication rate for PTBD insertion is not high, however, the consequences can be significant. Familiarity with the possible complications and their imaging feature can help interventional radiologists to detect and treat the complications.