

**College of Health and Medical Technologies**  
**Department of Radiology Technologies**  
**Radiological procedures- 1**



# **BILIARY DRAINAGE**

**2 nd stage**

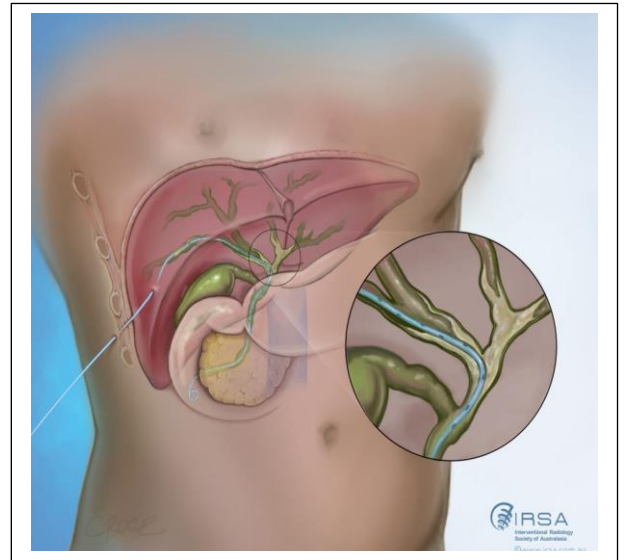
**LECTUER 6**

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**MSc Radiographic Imaging**

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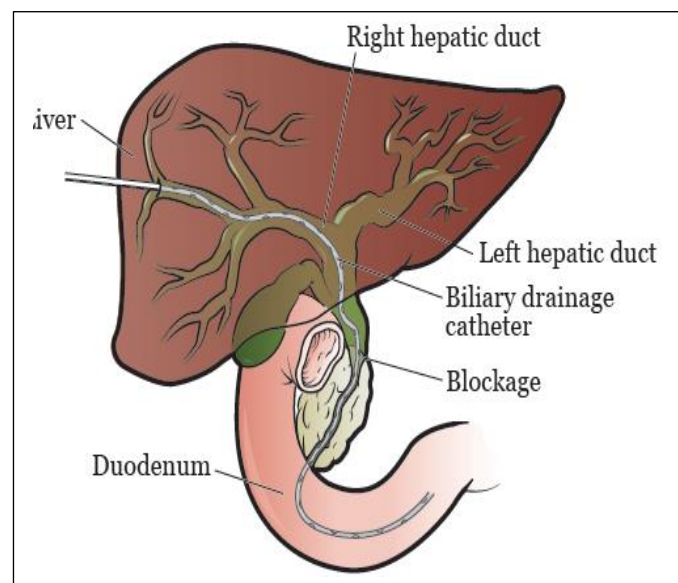
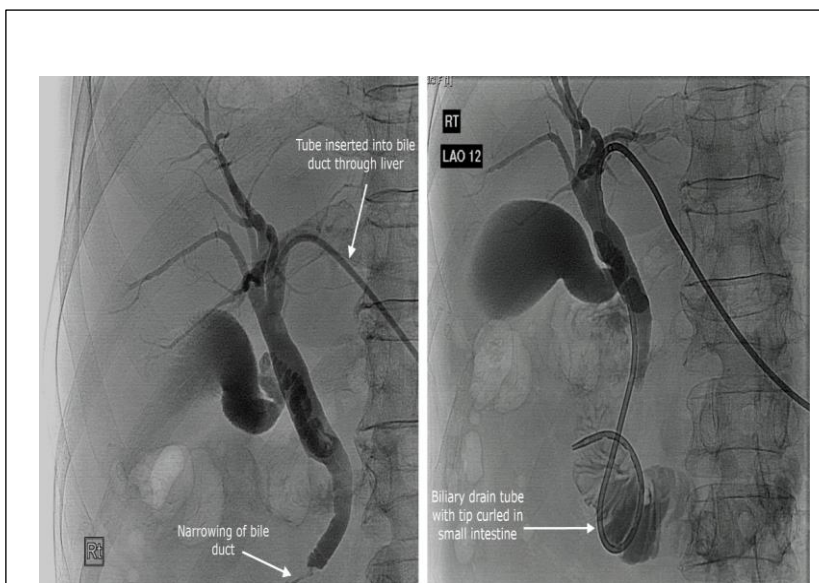
## EXTERNAL BILIARY DRAINAGE

This is achieved following transhepatic cannulation of the biliary tree as described previously. The procedure may be performed to relieve jaundice or sepsis prior to surgery or as a further percutaneous intervention.



## INTERNAL BILIARY DRAINAGE

This can be achieved following transhepatic (as described previously) or endoscopic cannulation of the biliary tree. A percutaneous drainage catheter may allow internal or external drainage with side holes above and below the point of obstruction. At ERCP an endoprosthesis or stent is placed to drain bile from above a stricture or to prevent obstruction by a stone in the duct.



## **Indications**

1. Malignant biliary stricture
2. Benign stricture following balloon dilatation

## **Contraindications**

As for PTC.

## **Contrast Media**

LOCM 200 mg I mL<sup>-1</sup>; 20–60 mL.

## **Equipment**

1. Wide-channelled endoscope for introduction of endoprosthesis by ERCP
2. A biplane fluoroscope facility is useful but not essential for transhepatic puncture
3. Set including guidewires, dilators and endoprosthesis Patient Preparation

## **Technique**

### **Transhepatic**

1. A percutaneous transhepatic cholangiogram is performed.
2. A duct in the right lobe of the liver that has a horizontal or caudal course to the porta hepatis is usually chosen. This duct is studied on US to judge its depth, and then a 22G Chiba needle is inserted into the duct under US or fluoroscopic guidance. A coaxial introducer system is used over a 0.018 guidewire to allow 0.035 wire and catheter access into the bile ducts. If the duct is not successfully punctured, the Chiba needle is withdrawn but remains within the liver capsule, allowing a further puncture attempt. Once a 0.035 wire is established in the bile duct, a sheath can be inserted— e.g. 7-F. Bile can be drained through the side arm of the sheath while a catheter is manipulated over the wire. For internal drainage or stent insertion, the wire and catheter must be passed through the stricture into the duodenum or postoperative jejunal loop. For external drainage, a suitable catheter can be inserted over the wire after the sheath is withdrawn. A variety of wires and catheters may be needed to cross difficult strictures. Failing this, external drainage is instituted, and a further attempt is made to pass the stricture a few days later.
3. An internal/external catheter may be placed across the stricture and secured to the skin with sutures.
4. A metal biliary stent may be positioned and deployed across a malignant stricture to facilitate internal drainage of bile. Balloon dilatation may be required before or after stent deployment in some cases. A temporary external drainage tube may be left in place for 24–48 h.

## **Endoscopic**

1. Cholangiography following cannulation of the biliary tree
2. Endoscopic sphincterotomy
3. A guidewire is placed via the channel of the endoscope through the sphincter and pushed past the stricture using fluoroscopy to monitor progress
4. Following dilatation of the stricture, the endoprosthesis (plastic stent) is pushed over the guidewire and sited with its side-holes above and below the stricture. Metal biliary stents can also be placed at ERCP when appropriate.

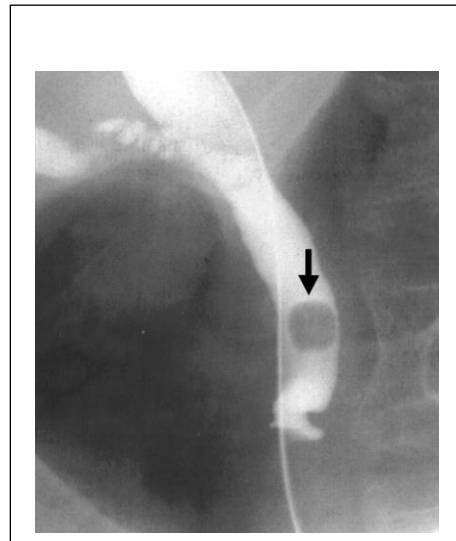
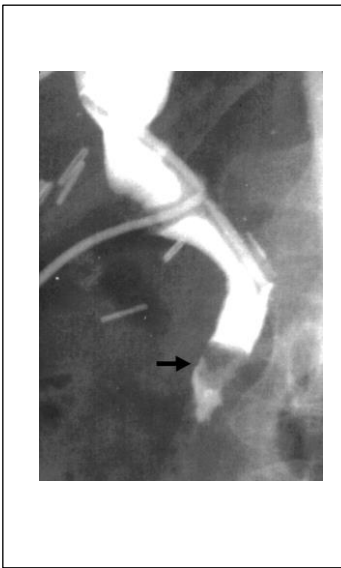
## **Aftercare**

1. As for percutaneous transhepatic cholangiography
2. Antibiotics for at least 3 days
3. An externally draining catheter should be regularly flushed through with normal saline and exchanged at 3-monthly intervals. (It is rare to leave a drain in situ for such a long period.)

## **Complications**

1. As for PTC, ERCP and sphincterotomy
2. Sepsis—particularly common with long-term, externally draining catheters
3. Dislodgement of catheters, endoprotheses
4. Blockage of catheters/endoprotheses
5. Perforation of bile duct above the stricture on the passage of guidewire.

# PERCUTANEOUS EXTRACTION OF RETAINED BILIARY CALCULI (BURHENNE TECHNIQUE)



## **Indications**

Retained biliary calculi seen on the T-tube cholangiogram (incidence 3%).

## **Contraindications**

1. Small T-tube (<12-F)
2. Tortuous T-tube course in soft tissues
3. Acute pancreatitis
4. Drain in situ (cross connections exist between the drain tract and the T-tube tract)

## **Contrast Medium**

HO�M or LOCM 150 mg I mL<sup>-1</sup> (low-density contrast medium is used to avoid obscuring the calculus).

## **Equipment**

1. Fluoroscopy unit with spot film device
2. Steerable catheter system with wire baskets

## **Patient Preparation**

1. Prophylactic antibiotics and pre-medication 1 hour prior to the procedure
2. Analgesia during the procedure

## **Technique**

1. The patient lies supine on the x-ray table. A PTC is performed if a biliary drainage catheter is not already in situ.
2. The drainage catheter is removed over a guidewire and a sheath inserted into the ducts (7 or 8-F).
3. Contrast is injected to identify presence and location of stones and strictures.
4. If there is a stricture, advance a biliary manipulation catheter and guidewire (0.035) across it. Commence balloon dilatation over the guidewire (e.g. 8, 10 and possibly 12 mm).
5. Attempt to dislodge stones with balloons into the Roux loop.
6. If this is unsuccessful, pass the Dormier basket through sheath and attempt to catch the stone in the basket.
7. Advance the basket into the Roux loop and release the stone into the loop.
8. Remove the basket.
9. Pass the guidewire, remove the sheath and place the biliary drainage catheter.
10. Intermittently inject the contrast media to clarify the position of the stones.

## **Aftercare**

1. Pulse and blood pressure half-hourly for 6 h
2. Bed rest for 4–6 h.

## **Complications**

### **Due to the contrast medium**

1. Allergic reactions—rare
2. Pancreatitis.

### **Due to the technique**

1. Fever
2. Perforation of the T-tube tract.

**GOOD LUCK**