

Percutaneous Biliary Interventions

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KEYWORDS

• Percutaneous • Biliary • Interventions

KEY POINTS

- Many types of percutaneous biliary procedures are performed by interventional radiologists.
- Indications and specific treatment options for percutaneous biliary intervention in the setting of benign and malignant disease are discussed.
- Preprocedure evaluation, including review of imaging and symptoms related to biliary obstruction, are discussed.
- When a percutaneous approach versus endoscopic or surgical intervention is indicated is reviewed.

INTRODUCTION

Biliary obstruction can result from benign or malignant etiologies. As a result of biliary obstruction, patients may present with jaundice, pruritus, or with cholangitis if there has been prior biliary intervention. The indications for intervention and ultimate management of benign and malignant biliary obstruction are different, and it is important for the patient, caregiver, and operator to have a clear and common understanding of the goals of intervention.

Commonly performed percutaneous biliary interventions include cholangiography, external or internal/external biliary drainage, stent placement, biliary stone retrieval and bile duct biopsy. Well-accepted indications for percutaneous biliary intervention include diagnosis and decompression of a stricture, access to remove bile duct stones, diversion of bile in the setting of a bile leak, to lower the bilirubin to allow for chemotherapy, and to treat pruritus or cholangitis. A general list of possible procedures and their indications is provided in [Table 1](#).

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Procedure	Indication	Relative Contraindications
PTC	Anatomic characterization	Coagulopathy Allergy to iodinated contrast Ascites
PTBD	Cholangitis Pruritus Symptoms related to jaundice (anorexia, nausea) Decrease serum bilirubin for chemotherapy Preoperative optimization Bile leak	Same as PTC Multiple segmental or subsegmental isolations (in which case drainage is unlikely to provide palliation except of pruritus)
Percutaneous balloon dilatation	Definitive treatment of benign strictures	Same as PTBD Sepsis, cholangitis
Percutaneous metallic stent placement	Definitive treatment of benign or malignant strictures Exclude bile leak	Same as PTBD Sepsis, cholangitis Surgical candidate
Percutaneous transcatheter brush biopsy	Diagnose cause of biliary stricture	Sepsis, cholangitis Coagulopathy

Abbreviations: PC, percutaneous cholangiography; PTBD, percutaneous biliary drainage.

TECHNICAL CONSIDERATIONS

Preprocedural Planning

Before any biliary intervention, a detailed clinical history of prior biliary intervention and recent high-quality cross-sectional computed tomography (CT) scan or magnetic resonance imaging (MRI) should be reviewed. Careful review of imaging helps to define the bile duct anatomy, evaluate for parenchymal atrophy and portal vein patency, and for the presence of ascites. With good quality imaging, the presence of segmental or lobar isolation of bile ducts can often be predicted. By following the bile ducts in an orderly fashion, segment by segment, from the periphery to the hilus, a mental 3-dimensional model of the biliary tree can be constructed to plan intervention. This information is critical, not only for procedure planning, but to adequately inform the patient and referring team about the likelihood of success and realistic outcomes, including the possibility of having an external catheter versus an internal stent.

Preprocedure cross-sectional imaging can sometimes also define the nature of the obstruction. Magnetic resonance cholangiopancreatography (MRCP) has a diagnostic accuracy of more than 90%, with benign strictures showing regular, symmetric, and short segment narrowing; malignant strictures, in contrast, tend to be irregular, asymmetric, and long segment.¹ When distinction between benign and malignant cannot be made on cross-sectional imaging, a biopsy may be warranted.

The level of obstruction can be defined as high or low. Low bile duct obstruction involves the common bile duct, below the insertion of the cystic duct. Typically, low bile duct obstruction is best managed endoscopically because the placement of a single (plastic or metal) stent can effectively drain the entire biliary tree. If an endoscopic approach is not possible, for example, because of prior surgery, or not successful, a percutaneous approach can be considered.

High bile duct obstruction occurs at or above the common hepatic duct. The Bismuth-Corlette classification describes types of high bile duct obstruction from

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