

Cholangioscopy in Liver Disease



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KEYWORDS

• Cholangioscopy • ERCP • Biliary stricture • Biliary tract neoplasms • Biliary stones

KEY POINTS

- Cholangioscopy is an adjunct to endoscopic retrograde cholangiopancreatography (ERCP) and can be used for the diagnosis and therapy of a variety of biliary diseases.
- Cholangioscopy is effective in the management of difficult biliary stones and aids in the diagnosis of biliary tumors.
- Cholangioscopy provides direct visualization to guide selective biliary access and the delivery of other therapies. Multiple cholangioscope platforms exist.
- Cholangioscopy may be associated with a higher complication rate than conventional ERCP.

INTRODUCTION: NATURE OF THE PROBLEM

Miniature endoscopes and catheters have been developed that permit direct visualization of the bile ducts, referred to as cholangioscopes or choledochoscopes. For the purpose of this article, these devices are referred to as cholangioscopes, and the procedure as cholangioscopy. Cholangioscopes are usually passed through the working channel of a standard therapeutic duodenoscope during endoscopic retrograde cholangiopancreatography (ERCP).

The first cholangioscope was described in 1941,¹ and the per oral approach was subsequently introduced in the early 1970s.^{2,3} Further improvements in the technology have resulted in smaller diameter cholangioscopes that include a working channel, the ability to deflect the tip of the scope,⁴⁻⁶ disposable catheter-based delivery systems with a reusable optical fiber,⁷ and direct cholangioscopy using slim gastroscopes without the use of a duodenoscope.⁸

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This article reviews cholangioscopy performed during ERCP and provides a brief overview of direct cholangioscopy utilizing slim gastroscopes.

INDICATIONS AND CONTRAINDICATIONS

Cholangioscopy is most established for and used primarily for the treatment of difficult bile duct stones using electrohydraulic or laser lithotripsy probes and for the evaluation of indeterminate biliary strictures. These are strictures in which a diagnosis was not certain after ERCP with sampling techniques such as brush cytology or forceps biopsy.⁶⁻¹⁹ Cholangioscopy can be used to directly visualize and sample lesions seen on cholangiography, either with direct biopsy through the cholangioscope's working channel, or to target areas for fluoroscopic biopsy through the duodenoscope (eg, cholangioscopy-assisted biopsy).¹² It can also be used to evaluate equivocal fluoroscopy findings on cholangiography, assess the extent of biliary tumors before surgery, identify stones not seen by conventional cholangiography, assess for clearance of stones during ERCP, and for surveillance of primary sclerosing cholangitis (PSC).^{13,14} It may also be used to guide advanced imaging with biliary confocal microscopy and selective ductal access, such as cystic duct or difficult to negotiate intrahepatic segments.

Most available cholangioscopes range from 3.1 to 3.4 mm in diameter; thus, the bile duct must be of sufficient caliber to allow passage (Table 1).⁶ Downstream strictures may require balloon dilation to permit passage of the cholangioscope. Because in 1 study cholangioscopy may be associated with a higher rate of cholangitis than ERCP alone, it should be avoided in patients with active cholangitis.²⁰ A more recent study did not confirm this increased risk, however (see Table 1).²¹

PREPARATION

Before ERCP, patients typically take no food by mouth for 4 to 8 hours and sometimes longer if there is known or suspected delayed gastric emptying.²² Alternatively, clear liquids can be taken up to 2 hours before elective procedures requiring general anesthesia or sedation/analgesia (American Society of Anesthesiologists guidelines).²³

Most medications can be continued up to the time of endoscopy and are usually taken with a small sip of water. Some medications may need to be adjusted before upper endoscopy, such as medications for diabetes, owing to decreased oral intake

Table 1
Indications and contraindications to cholangioscopy

Indications	Contraindications
Therapy of difficult bile duct stones	Surgically altered anatomy making bile duct inaccessible
Indeterminate biliary strictures	Ascending cholangitis
Evaluation of equivocal findings during endoscopic retrograde cholangiopancreatography	Small duct <5 mm in diameter
Assessment of biliary tumor extent before surgery	
Assess for residual stones in dilated bile ducts not seen on cholangiography	
Surveillance of dominant stenoses in primary sclerosing cholangitis	

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