IR Endoscopy: How to Start Your Practice

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Why Endoscopy in IR?

• What is endoscopy?
  An **endoscope** is an illuminated optical, typically slender and tubular instrument used to look deep into the body and used in procedures.

• What is Interventional Radiology?
  ‘**Interventional** radiology, sometimes known as vascular and **interventional** radiology (VIR), is a radiology specialty which provides minimally invasive **image-guided** diagnosis and treatment of disease’.

  Fits right into our skill &ability to use multi-modality Imaging guidance (Fluoroscopy, CT, MRI, Ultrasound, Optical, navigational)
Choledochoscopy
Advantages for Interventional Radiology

• Revenue, more procedures
• We already perform transhepatic procedures- natural extension
• Combined flouroscopy/ endoscopic examination
• Failed / ineligible ERCP/ peroral patients
• Help patient with dismal disease/ no option patients
IR Endoscopy
Cholangioscopy – most common

• Percutaneous transhepatic cholangioscopy (PTCS) allows direct visualization of the biliary tree for diagnostic and therapeutic interventions.

• Cholangioscopy is an extension of procedures already performed by Interventional Radiology.

• Entrenched in IR division since the 1990, several around the USA and internationally (notably Asia)
Indications

• Direct visualization of filling defects and masses seen on diagnostic cholangiography and cross-sectional imaging
  • Evaluate longitudinal tumor extension for surgical planning in patients with cholangiocarcinoma

• Biopsy of biliary mass under direct visualization

• Treatment of choledocholithiasis with a variety of tools, including laser lithotripsy

• Less common indications: Biliary stricture dilatation and local ablative therapy for biliary tumors

1-5
How to get started:

1. Practice building: Are there potential patients?
2. Equipment: what options?
3. What Therapeutic options?
4. Cases
Practice Building
Start with patients with least options

1. Altered anatomy from surgery, such as Roux-en-Y hepaticojejunostomy or pancreaticoduodenectomy (Whipple procedure) inaccessible to ERCP
2. High biliary sites with Hepatolithiasis – challenging to treat, especially with stones distributed high within the liver
3. Cholelithiasis- non surgical candidates with medical comorbidities
Getting the right equipment: Scope System

• 2.8 to 6.0 mm in diameter
• 35 to 70 mm in length
• 2.0 to 2.6 mm accessory channel
• Additional therapeutic instruments, including lithotripsy fibers, baskets, forceps, balloon dilators, and guidewires
• Use flexible fiberoptic choledochoscopes

• Olympus, Pentax
Cholangioscope System

Two access ports

Irrigation system

Posterior port (arrowhead) is used for passage of wires and instruments (working channel)
• control section: dial for up/down 2-way 180° tip deflection
• 1 instrument channel
• Fiberoptic
• air/water and suction channels
• connector section
Cholangioscope Imaging System

1. Monitor
2. Light source
3. Image processor
4. Irrigation pump
To Treat?
Break up Stones
Laser Lithotripsy

• Laser lithotripsy is used to fragment stones. Modern Lithotripsy
• Laser several advantages, including greater precision in targeting stones and much smaller caliber probes
Laser Lithotripsy

3F laser fiber (Boston Scientific, Lumenis)

We use a 20-watt holmium-YAG laser (VersaPulse PowerSuite 20W Holmium Laser, Boston Scientific) with foot pedal to activate pulsed laser (arrow).

**Laser settings:**
- Pulse energy: 0.8 J per pulse
- Pulse frequency: 10 Hz
- Power: 8-10 Watts
- Never more than 5 seconds per pulse

New Approach (especially Gallstones): stone dusting setting (low energy, high frequency)
Problem of costs and equipment

- Turn around of sterilization (3-7 days)
- Number of cases in one day (one per day; depending on # scopes)
- Cost: scope plus imaging chain ($60-90K; equivalent to Ablation system)
- Need for easier equipment and start up cost
- If you need to share with Urology or GI: turf, conflict
Major recent step: single use disposable scope

- LithoVue™ Single-Use Digital Flexible Ureteroscope (Boston Scientific)

HUGE BENEFITS:
- No need to share scope with OR or GI: avoid conflict/ turf battles
- No sterilization
- Light source embedded in handle (no light box)
- Image Monitor with integrated image processes
- No problems with turn around time (3 days up to one week)
- Much reduced capital investment and running costs (acquire, repair, sterilize, reprocess, prepare and manage)
- Simpler system, less buttons
Newer technology: Single use/Disposable scope:

- all-in-one solution
- LithoVue™ Single-Use Digital Flexible Ureteroscope
- 9.5F outer diameter
- A digital CMOS imager in the tip
- LED light source is integrated, no need for light source, built into the lightweight, control handle
- workstation’s monitor with integrated image processing on a compact, rolling cart.
- fully compatible with laser lithotripsy through working channel
Tract Formation – Based on Complexity of PTCS

**Simple Diagnostic PTCS**
- 2 weeks with 8-10F drain
- Perform PTCS with 9F access sheath or bare tract

**Complex PTCS (Large core bx, Stone cases)**
- 2 weeks with 8-10F drain
- Upsize to 12F drain and wait additional 2-4 weeks
- Serially dilate over stiff wire to 16F access sheath to perform PTCS
Cholangioscopy Procedure

**Biopsy**
- Position Multipurpose (MPA) or Lieberman guide catheter
- Advance clamshell biopsy device through catheter

**Basket Stone Removal**
- Position Multipurpose (MPA) or Lieberman guide catheter
- Deploy basket within the distal tip of the catheter. Expose basket slightly distal to the stone using the “pin-pull” technique to retract the catheter.
- Stone may fall into the side openings of basket. Spinning basket at the level of the stone may help to capture it. Retract basket through the access sheath to extract the stone.

**Laser Lithotripsy**
- Place laser fiber through working channel of scope.
- The laser fiber tip should be positioned just proximal to the stone, which will allow the laser light to reflect off the surface of the stone, thus marking the target for lithotripsy.
CHOLANGIOSCOPY CASE
44 year old woman with history of biliary duct injury status post cholecystectomy for cholelithiasis requiring hepaticojejunostomy complicated by HJ anastomotic stricture.
Stone – Small & multiple
Stone + ischemia Stricture S/P lab chole injury
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Inflamatory pollips/papilloma,
Inflammatory mass at HJ
Also: Gallbladder interventions

72 yr old, critical Aorticstenosis
Gallstone and Cholecystitis
WHAT ELSE? Gateway to new interventions

1. cholecystoscopy and lithotripsy, newer outcomes primary and 2nd outcome success rates of 85% and 100%.
2. assistance with ureteroplasty and NUS stent placement
3. transgastric approach for foreign body removal with duodenal

Can you get paid for doing these procedures?

Transhepatic Choledochoscopy
New procedures, new Revenue
Available CPT codes

Diagnostic percutaneous cholangioscopy
- CPT code 47552
- biopsy 47553
- stone removal 47554
- Dilation 47555
- Dilation with drain placement 47556.
Conclusion

• The role of the Interventional Radiologist continues to expand in the treatment of biliary disease with scopes.

• PTCS provides direct visualization of the biliary system for diagnostic and therapeutic interventions, especially when prohibitive for a peroral approach.

• highly effective in treating obstructive stones in the biliary system, which may require laser lithotripsy.

• Overall, safe and effective procedure when performed by an experienced interventionalist with an understanding of techniques to reduce complications.