The Connecticut Society of Gastroenterology Nurses & Associates

Presents:

Hands-On ERCP Workshop 2017

October 13th, 2017
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Guidewires / Papillotomes

By
Donna Jacobs, BS, RN, CGRN
Jane Carey, BSN, RN, CGRN, CAPA

Objectives

At the conclusion of this presentation, the participant will be able to:
1. Describe the benefits of various wires
2. Describe various sphinctertomes
I. INTRODUCTION
   A. Purpose of guidewires
   B. History of guidewires
      1. Sizes
      2. Lengths
      3. Shapes
      4. Types
   C. Complications with wires
      1. Bleeding
      2. Perforation
      3. Failed device placement

II. Nursing Role with Sphinctertomes
   A. Purpose of sphinctertomes
   B. Exchange
   C. Complications
   D. Needle knife indication
      1. Technique and safety
      2. Complications
   E. ERCP: Matching wires and Papillotomes
      1. The straighter the better (except for Dash)

III. Nursing Role in Exchanges
   A. Three Areas to Watch
   B. Why pre-moisten wires?
   C. Flushing Accessory equipment
      1. The wetter the better
      2. Water lubricates for wires to pass freely
   D. Watch Three Areas and Communicate
   E. Complications

IV. Nursing Role with Sphincterotomes
   A. Purpose of Sphincterotomes
B. Exchange
C. Complications

V. Hands on Demonstration/Return Demonstration
   A. Questions and Answers

I. A. Introduction
   The purpose of using a guidewire is to help gain and maintain access in the duct. Guidewires are radiopaque, for visualization under fluoroscopy, and vary in diameter, length, shape, and types. Accessory ERCP equipment will follow the direction of the wire.

B. History of Wires
   Guidewires come in four sizes: 0.018, 0.021, 0.025, and 0.035. The larger the wire the stiffer the wire.

   **Coil wire**-This was the first wire to evolve. It was a 0.035 wire and it held the contrast in its grooves. It is sticky and long. Because of the difficulty working with these a search for smaller wires to be used with smaller tip catheters was needed.

   0.018 wires were made with no coating. To add a coating to this wire would increase the diameter size > 0.018. This wire tends to be floppy. The larger the diameter the stiffer the wire. This wire you typically cannot cut over. This wire is good for tight strictures.

   **Coated guidewires** came next. This was to enable the endoscopist to perform a sphincterotomy/papillotomy.

   **Tracer hybrid** wires has the coating over the wire and a floppy tip. The protector wire has the coating. **Glidewire** - Next generation was a floppier tip. This is hydrophilic throughout. It is floppier when wet and is good for strictures *not* sphincterotomies. This wire did not pass the insulation process.
The **Metro** wire is a hydrophilic tip only.

**Angled** wires were made to divert into new directions i.e. away from pancreas. They are curved at the end. They can be used in the pancreas to push the wire up and knuckle it through to follow the main duct. Or, when in the CBD and the wire keeps going in one direction so the angled wire will help divert it into the desired direction.

**Jag Wire** - they have yellow and black stripes. They are easier to view wire movement on exchanges. **Mark 5**- are similar to the jag wire but are marked with numbers to view movement in or out of the duct.

**Pre-loaded sphincterotome** - **Dash sphincterotome**. Guidewire already set in sphinctertome, eliminates one exchange. There is no need to flush this wire.

**Torque Devices**- are found on some wires. This will torque, pull, push wires. Look at the product for this feature. This is more effective on short wires. This is used mostly by radiologists due to their need for fine wire work. The shorter the wire the easier it is to torque.

**Fusion System**- similar to rapid exchange. Catheter is closed; wire passes along side of cannula and enters at end.

**Wire Lengths**-
- 185 Fusion Ultra short wire
- 200cm Glide wire
- 260cm short wire
- 480cm long wire

**ADV**-Short wires offer MD better control. This contributes to better patient care as the nurse is able to provide more attention to the patient i.e. IVCS needs.

**DADV**- Short wire provide the access but now must do exchange.

**Hydro exchange**- the catheter is placed in the scope- put the wire up the duct. Because the wire is too short for exchange, the RN
fills a 60cc syringe and leur locks it to the end of the catheter- while the RN pushes the water the MD pulls the catheter back enabling the wire to stay in place. **Long Wires** are more cumbersome, but sometimes easier.

II. **Nursing Role in Exchanges**

**There are three things to watch during an exchange.**

1) Watch the video screen-make sure the wire is not moving in, out, looping, or bowing. This is where spiral or numbered wires help.

2) Watch the endoscopists’ hands. You should be pulling and pushing at the same speed.

3) Watch fluoroscopy. Not much should be needed if watching the wire. Only an occasional flickering should be needed.

**Always, always, always communicate.**

Flush the wire port of the sphinctertome, balloon, or accessory device being used. With wires remember “the wetter the better, the straighter the better”. There are exceptions to every rule i.e. dash. Water is a natural lubricant and creates friction in the catheter. This makes it easier to pass wires in cannulas, sphinctertomes, balloons, etc. **Watch the three areas when making the exchange and communicate.**

Complications with wires are bleeding, perforation, failed device placement, infection.

III. **Nursing Role with Sphincterotomes**

Sphincterotomes are used to gain access into the papilla to facilitate drainage and to allow for wire advancement, stone extraction and stent placement.

**Not all wires are sphincterotome compatible.**

- **Always read the package inserts.** It will tell you if you can cut over the wire (perform sphincterotomy/papillotomy).
- **Know your equipment.** Select the correct equipment for the right job.
Can you cut over it? Is it the right size?

**Double Lumen Sphincterotome** - One lumen for contrast injection or guidewire insertion.

**Triple Lumen Sphincterotome** - One lumen for contrast injection and one lumen for guidewire insertion.
SIX STEPS TO SAFER, SIMPLER WIRE GUIDE USE.

1. DON'T FORGET TO FLUSH!
To avoid the difficulty of inserting wire guides through catheters after contrast injection, flush the catheter with approximately 2-3 cc of sterile water.

2. WIPE WIRE GUIDE BEFORE AND AFTER.
For safer, easier movement, all wire guides should be wiped with a moistened 4" x 4" gauze before they are inserted or removed.

3. TAKE IT SLOW AND EASY.
Relax! Keep the kinks out of the procedure by advancing the wire guide in 1-2 cm increments. Don't rush it!

4. KEEP AN EYE ON THE ACTION...
Carefully monitor and acknowledge the wire guide tip under fluoroscopy and, if applicable, endoscopic markings for migration during catheter exchanges.

5. GET A LITTLE HELP ON THE SIDE.
To inject contrast with a wire guide in place, use a side arm adapter and a 10 cc syringe. Use the cap on the side arm adapter to seal the ERCP catheter injection port. Flushing with sterile water is a must after the use of contrast.

6. REMEMBER, SLIPPERY WHEN WET.
The Tracer™ wire guide is pre-loaded in an injectable holder. To activate the Tracer's Slip-Coat™, place a 20 cc syringe pre-filled with sterile water onto the luer lock hub. Inject sterile water through the holder until it flows from the Tracer's tip.
Cytology Brushing/Dilatation

By:
Rita Botelho, RN, CGRN
Judith C. Grippo, BSN, RN, CGRN, CAPA

Objectives:

At the end of this presentation, the participant will be able to:
1. Discuss the use of cytology brushes and biliary dilators
2. Describe technique in using cytology brushes and biliary dilators
BILIARY DILATION

Biliary dilatation can be accomplished by hydrostatic balloon or catheter. Both types of accessories can be passed over a wire guide. The dilating catheter provides a sheer-force method, which involves forcing a dilator through a narrowed area, using axial force to enlarge the lumen. The balloon dilator involves inflating a balloon within the lumen thereby providing a radial force that accomplishes the dilation.

BALLOON DILATORS

- Balloon Dilators are inflation devices housed on a catheter. They are used to provide specific ATM or pounds per square inch of pressure to dilate strictures of the biliary tree.
- Balloon Dilators come in a variety of sizes. Inflated diameter is listed first followed by the length of the balloon.
- The inflation pressure, duration, and frequency of dilation are at the discretion of the physician.
- A pressure type syringe is needed to inflate the balloon to desired size. The syringe should be filled with sterile water, saline or dilute contrast. Do not use air or gaseous substances to inflate the balloon. (COOK Endoscopy, 2006, 1-3)
- Do not inflate the balloon prior to introduction into scope.
- The entire balloon must be extended outside the scope and be fluoroscopically visualized and positioned before inflation.(COOK Endoscopy, 2006, 3)
- The dilation balloon is always placed over a Guidewire. The balloon should be flushed with sterile water or saline prior to placement over wire.
- The balloon must be thoroughly deflated, with all fluid removed, before withdrawal. Maintain constant negative pressure while withdrawing balloon.
CATHETER DILATORS

- Dilating Catheters come in a variety of sizes from 3 French to 12 French. Sequential or graduated catheters may be used to achieve the desired size. All dilators have radiopaque markers near the tip.
- Placement of the correct size Guidewire is imperative.
- After the Guidewire has been secured within the duct, the dilator is slowly advanced until the largest part of the dilator has traversed the obstruction.

CYTOLOGY BRUSHING

- Biliary brush cytology is the most frequently used and simplest method to obtain the diagnosis of cancer. Although this method has a specificity of close to 100%, it has only moderate cancer sensitivity with ranges of 18% to 60%.
- The type of tumor responsible for biliary strictures has a direct correlation to the cancer detection rate. Cytology brushing yields a higher sensitivity for cholangiocarcinomas than pancreatic cancers.
- Low yield results have been associated with an inadequate cellular sampling and many malignancies are extrinsically located in the biliary tree. Therefore, obtaining malignant cells is difficult.
- There are many varieties of cytology brushes available. Designs include brushes of different sizes and stiffness, which can be used over Guidewires. Outer sheaths range from 6 to 8 French.
- In one study conducted by Fogel, et al., the use of a longer and larger cytology brush with stiffer bristles does increase the cellular yield but does not increase the cancer detection rate. (Fogel et al., 2006, 76)
- Meticulous technique ensures a greater chance of success. Vigorous manipulation of the brush while in contact with the duct will increase cellular yield.
STOP and BRUSH the slides as soon as the brush is withdrawn from the scope. If your institution uses another method of setting the sample, do this immediately.

Follow your institution’s policy regarding sending the cytology brush along with the slides.

The cancer detection rate is increased with the use of more than one method of sampling i.e., brushing and biopsy or FNA. (TECHOLOGY ASSESSMENT COMMITTEE, 2006, 743)

Complications are rare but could include perforation and pancreatitis. (TECHOLOGY ASSESSMENT COMMITTEE, 2006, 743)

References:


Objectives:

At the conclusion of this presentation, the participant will be able to:

1. Identify indications for use of the lithotripter
2. Describe technique for use of the lithotripter
ERCP Stone Extraction

Most gallstones (85%) are formed from “supersaturated cholesterol.” They can range in size from a few millimeters to several centimeters. Gallstone disease is a common problem affecting up to 20% of the U.S. population. The bile duct can be cleared of stones 90% of the time by ERCP.

The remaining 15% of gallstones are “pigment stones” which are black or brown and are composed of biliary pigments, cholesterol, and/or calcium salts. The ratios vary, and they are often associated with biliary strictures, infection, or other reasons when biliary stasis is seen.

The extraction device selected by the MD is dependent on the size of the bile duct, the size of the stone, and the size of the papillotomy. The following guidelines may assist in the MD’s preference of whether a balloon, basket, or lithotripsy is used to extract stones:

<table>
<thead>
<tr>
<th>Narrow, skinny CBD</th>
<th>Favors using a Balloon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dilated CBD or &gt; 10mm stones</td>
<td>Favors using a Basket</td>
</tr>
<tr>
<td>Multi-stones</td>
<td>Favors using a Balloon</td>
</tr>
<tr>
<td>Larger Stones (&gt; 15mm)</td>
<td>Favors using the Mechanical Lithotripter</td>
</tr>
<tr>
<td>Size of the Papillotomy</td>
<td>Influences whether or not a basket is used</td>
</tr>
</tbody>
</table>

Balloons and Baskets come in a variety of sizes, designs, and capabilities. Balloons can usually assist in removing most stones. One disadvantage in using balloons is that when faced with larger stones, the balloon may break, or in a very dilated duct, it may slip around the stone. Special attention in removing multiple stones with a balloon is necessary in preventing a “Box Car” effect. Multiple stones should be removed starting with those closest to the papilla.

Baskets offer the opportunity to manually extract stones, as well as the ability to crush softer stones.

Specialty Baskets include Wire Guided Baskets, to help access smaller or difficult ducts (there may be disease or anatomy challenges), or Non Wire Guided Baskets. Non Soehendra Compatible Baskets (for basic stone removal, or if there is a small stone and a wide duct to work with) and Soehendra Compatible Baskets also exist. It is up to the MD to decide which type of basket is indicated for each patient. Each facility will determine which baskets will be stocked.

If it is determined that balloons and or baskets have not been successful, a basket is stuck, or very large or hard stones exist, a variety of specialty lithotripter devices can be used. Mechanical lithotripsy includes several types of devices. Depending on the lithotripsy device selected, it may be used through the scope, or less commonly, with the scope removed. Additionally, high-energy shock waves can crush stones.
Boston Scientific Trapezoid RX Lithotripter Compatible Basket

The Trapezoid is a device used to facilitate the removal of biliary calculi. Once advanced through the endoscope and into the common bile duct, this device serves as a crushing and or retrieval tool whereby the stone fragments or whole stone may then be removed through the duodenal papilla.

General Description

- Can be inserted with or without guide wire in place
- Acts as a simple basket to retrieve or crush soft stones by alternately squeezing and opening the basket
- Can be converted to a lithotripter to crush harder stones
- The tip of the basket will break off if stone is too hard to crush
- Basket is made of Nitinol which provides memory for shape
- Baskets are 3 cm wide, 2.5 cm, 2.0 cm; and 1.5 cm
- The Trapezoid may be inserted over a .035 wire

Using Basket

- MD will cannulate duct, make papillotomy and position wire directly above stones - while watching under fluoroscopy
- Remove papillotome leaving wire in place
- Prime basket with contrast - leaving tip of basket open a bit so contrast can purge through
- Open basket slightly to see the opening for back loading the wires
- Backload wire into basket
- Wire runs side saddle to catheter for about 20 cm before exiting
- MD advances basket, RN holds wire to maintain position in the bile duct
- Keep wire and basket directly above stones - watch on fluor - sweep stones into basket
- If basket is used over a wire, the wire can be retracted into the wire guide to allow greater flexibility of basket in capturing stone.
- Use handle to open and close basket as needed
Crushing Stone with Lithotripter

- Use with Microvasive Alliance II
- Load basket handle flat into Alliance body with directional switch in neutral position
- The neutral position allows for free movement of the basket in and out
- In the neutral position, pull the Alliance handle towards you to position the basket to capture the stone
- Watching fluoro, still in neutral, start closing the basket
- Turn the directional switch away from you, pointing to the stone, and squeeze the handle to crush the stone
- If the handle is squeezed too many times, or if there is a very hard stone, the distal tip of the basket will break off and its wires will separate
- Put lever in the neutral position to open basket and go after another stone
- You will then need to retract the broken wires (broken basket) from the endoscope

The silver basket tip is biocompatible; however, it should be retrieved, often with a balloon.
Olympus Emergency Lithotripter Handle

The Olympus Emergency Lithotripter Handle is used to crush hard biliary calculi in the event of a basket impaction. The device comes complete with a handle and coil sheath. This emergency tool is compatible with the Olympus Lithotriptor and all Olympus retrieval baskets. The device is reusable and may be autoclaved according to manufacturer’s instructions.

Using the Emergency Olympus Lithotriptor Handle

- The plastic outer sheath of the basket is removed
- Once the coil sheath is screwed into the handle and secured, the wires of the basket are back loaded into it
- The wires are threaded into the hole on the center rod and wrapped around the rod by rotating the lever (on right)
- Move the ratchet on the right forward, making only a forward movement of the cable
- Apply continuous, clockwise, even torsion to the rotating lever, bringing the basket to the sheath which will then crush the stone and release it
- The basket and device can be removed from the patient

To release basket from handle, turn ratchet backwards and rotate lever counter clockwise until basket unravels
## Olympus LithoCrush V Handle

### General Description

- This unit is the newest generation Olympus lithotripter for crushing stones and emergency basket retrieval
- This handle is compatible with all Olympus baskets, including the LithoCrush V Basket as well as other Soehendra compatible baskets
- The basket rotates for selective cannulation and capture of stones
- Olympus baskets have a characteristic “V” marking on the catheter. When this marking is at the biopsy port, it indicates the basket is located at the elevator.

### Connecting the Olympus LithoCrush V Handle to LithoCrush V Basket

- Remove the plastic protector from the basket
- Extend the basket’s pipe all the way out (you will see a black marking)
- Confirm the handle’s ratchet is in the “off” position
- Push the handle all the way in “forward”
- Turn the green screw on the handle counter clockwise to unlock release button
- Insert the basket’s pipe into the insertion hole in the handle and push forward until it stops
- Tighten the green screw
- Insert the Sheath’s Stopper into the handle until yellow marker on basket meets yellow marker on the handle; then lock in
- Pull and push on the handle holder to check proper opening, closing and positioning of basket to MD
- Check slide for extension of sheath
- Ratchet can be turned on just prior to crushing to provide an even tension when crushing biliary stones

### Detaching basket from handle

- Turn ratchet switch off
- Turn green screw on the handle counterclockwise to unlock release button
- Press yellow release button on handle and remove the entire basket for disposal
Stone Management
Balloons and Soehendra

By
Patti Pontolillo, BSN, RN, CGRN
Suzanne Colligan, RN

Objectives:

At the conclusion of this presentation the participant will be able to:

1. Describe the use of the occlusion retrieval balloons
2. Identify indications for use of the lithotripter
3. Describe technique for use of the lithotripter
Occlusion Retrieval Balloons

Occlusion retrieval balloons are used for removal of biliary stones and fragments.

Other uses for the balloon include:
- As a tamponade to control post-sphincterotomy bleeding
- Occlusion — with the balloon inflated inject contrast to fill above the balloon to allow visualization of the ductal system

When selecting an occlusion retrieval balloon, remember that:
- Balloons are available in double and triple lumen catheters
- They vary in size from 8.5mm - 18mm
- There are latex free balloons
- Balloons are made to occlude the duct not dilate it
- Exit ports vary — read the manufacturer’s information and know the physician’s preference
- **COMMUNICATE**

Potential complications include those associated with ERCP in addition to stone impaction, localized inflammation and/or pressure necrosis.
Instructions for Use:

- Remove device from package — inspect for any kinks bends or breaks. If any abnormality is detected, do not use.
- Verify balloon integrity prior to use by attaching the enclosed pre-measured syringe to the stopcock and inflating the balloon with air only. If any leakage is detected, do not use.
- If you are passing the balloon over the wire, flush the wire port with sterile water or saline to facilitate advancement. If a triple lumen balloon is used, flush the injection port with contrast to expel air. If a double lumen balloon is used, injecting over a pre-positioned wire can be accomplished by attaching a side port.
- Advance the deflated balloon through the accessory channel until it is visualized exiting the scope.
- The physician positions the deflated balloon above the stone to be removed — generally one stone at a time, starting with the lowest stone first to prevent impaction.
- Radiopaque markers are used for placement of the balloon, so know your product!
- Inflate the balloon after verifying the position using the provided syringe with air only. Turn the stopcock to 90 degrees to maintain inflation.
- The Endoscopist then gently withdraws the balloon toward the papilla, ensuring not to apply excessive pressure. If the stone does not pass easily, reassess the size of the sphincterotomy, or deflate the size of the balloon to a smaller size.
- Deflate the balloon by turning the stopcock to the open position once it is visualized in the duodenum — if the balloon hits the elevator it could break.
- Repeat process one stone at a time until duct is clear.
- Remove the balloon from the accessory channel, dispose of as directed.

References:
SOEHENDRA

The Soehendra Lithotripter is used to crush biliary calculi when other methods of stone retrieval have not been successful. It must be used in conjunction with Soehendra compatible baskets. The Soehendra can crush a stone and may also fracture the basket.

The Conquest TTC, "Through the Channel" Lithotripter Cable, is a disposable cable that is used while the scope remains inside the patient. After the handle is cut off of the basket, the plastic outer sheath must be gently pulled off before the basket wires are back loaded through the cable. You must have a working scope elevator to use this cable. A Touhy-Borst Adaptor may be used for contrast injection with this cable.

The reusable cable is used "out of the scope." With the basket handle cut as distally as possible, the scope is withdrawn from the patient slowly, and the basket is secured at the patient's mouth. The plastic outer sheath of the basket remains on and the basket is then back loaded through the cable and onto the crank handle.

Using Soehendra Compatible Baskets
- Baskets come in various sizes (2x4 & 3x6)
- Verify packaging label as Soehendra Compatible Basket
- Papillotomy is usually performed
- Papilla is cannulated with basket closed, basket is opened, visualized under fluoro and placed above stone(s)
- Basket capture stone and is pulled out
- If basket is not successful in removing/crushing stones, then lithotripsy is indicated
Crushing Stone with Lithotripsy Cable

- Cut off the clear plastic portion of the basket handle with a sharp wire cutter as close as possible to the handle
- If using the TTC, the scope stays in place and gently pull off the plastic sheath
- If using the Reusable Cable, the basket is kinked and the wire cutter is used to cut the clear plastic near the handle. The scope is then removed, leaving the basket and plastic sheath in place and secured at the mouth. The plastic sheath is advanced through the cable, through the male luer lock and through the Rotating Rod opening on handle and knotted twice.
- The MD will secure or anchor the basket in place by clamping down with the elevator when using the TTC
- This will allow the TTC cable to be advanced (by MD) down the biopsy channel without interrupting basket position
- When the wires begin to exit the cable, grasp them while the MD releases the elevator and allows the cable to continue advancing slowly
- The cable will reach the basket within the duct
- Pass the basket wires through the male luer lock on the Soehendra handle and through the Rotating Rod opening and knot twice
- Turn the crank handle (works only one way) with a slow, steady turning force; don't let go
- After the stone has been fractured, release the Soehendra handle
- Determine whether there are fragments of stones left to balloon sweep
- The Soehendra handle and the Reusable Cable should be soaked in warm water/enzymatic solution for 20 minutes, brushed to remove foreign matter, rinsed, ultrasonically cleaned, rinsed again, and sterilized according to the manufacturer's instructions.
Biliary & Pancreatic Plastic Stents

By

Janet Vernacatola, BSN, RN, CGRN
Mary Beth Castle, RN, CGRN

Objectives:

At the conclusion of this presentation, the participant will be able to:

1. Discuss indications for stenting
2. Describe technique for stenting
Types of Stents

Biliary Stents
- Pigtail Stents – these stents measure 5 Fr. or 7 Fr. in which one or both ends of the tube are coiled. Because of the small diameter, these stents provide inadequate drainage in many cases. They are primarily used to facilitate drainage when intra-ductal stones are present and cannot be removed.
- Barbed Stents – these stents measure 7 Fr. to 12 Fr. and have projections or “barbs” at each end. Barbed stents are used primarily for strictures of the common and/or pancreatic duct. Barbed stents maintain their position with infrequent dislodgement.
- Plastic Biliary Stents occlude after 3 to 4 months and will require replacement. Plastic stents are the stents of choice for benign lesions. Because of their low purchase price, they are preferred for short durations of therapy, up to 3 months.
- The larger the size of the stent, the greater the drainage. The length of the stent is dependent upon the length of the obstruction.

Pancreatic Stents
They are made from radiopaque polyethylene and are available in 3, 4, 5, 7, and 10 Fr. The length is available from 1 to 15 cm.

Indications:

Biliary
- Relief of obstructive jaundice due to a benign or malignant stricture of the bile duct
- Palliative treatment of inoperable or metastatic neoplasms of ampulla or pancreas
- Preoperative decompression to decrease complications in relation to elevated bilirubin
- Prevention of stone impaction in ampulla of patients who are at high-risk for surgery, and have had unsuccessful sphincterotomy and stone extraction
- Maintaining biliary decompression in cases of sclerosing cholangitis with stricture of the extra-hepatic bile ducts
- Post cholecystectomy biliary leak
Pancreatic
- Unresolved pancreatitis
- Idiopathic acute pancreatitis
- Pancreateas divisum with symptoms
- Pancreatic duct disruption; traumatic, carcinoma, and idiopathic
- Prevention of post-ERCP pancreatitis
- Chronic pancreatitis
- Pancreatic strictures and / or stones
- Sphincter of Oddi dysfunction

Potential Complications
- Bleeding from the sphincterotomy or the tumor
- Cholangitis
- Pancreatitis
- Trauma to the biliary tract or duodenum
- Obstruction of the pancreatic duct

Post Procedure Teaching
- Instruct patient to notify gastroenterologist if symptoms of recurrent obstruction occur:
  - Pruritus
  - Pain
  - Jaundice
  - Elevated temperature

Placement of Biliary or Pancreatic Plastic Stent

1.) Gather all appropriate equipment prior to the procedure.
   a. Type of stent needed
      i. Biliary or pancreatic
      ii. Straight (barbed) or pigtail
      iii. Size of stent: diameter and length
b. The conventional stent delivery system consists of a guide catheter, the stent itself, and a push catheter (tube).

c. The new stent delivery systems come pre-assembled, which allows for placement in a single step.

2. Stent placement:
   a. The guidewire is placed through an ERCP catheter into the duct that needs stenting and the catheter is removed over the guidewire. The guidewire should remain well above the stricture, and should be monitored frequently with fluoroscopy.
   b. A stent is then loaded onto the guidewire, making sure that the tapered end of the stent enters the biopsy port of the duodenoscope first. The stent is followed by the push catheter (tube), which guides the stent into the duct.
   c. For stents 10 Fr. or larger a therapeutic duodenoscope with a 4.2 mm chamber or greater must be used. A guide catheter, which has radiopaque markers to facilitate proper placement along the stricture, is passed over the guidewire and then the stent is deployed.
   d. During deployment of a stent it is imperative that coordination between the Endoscopist and GI assistant be maintained.
   e. The push catheter is passed along the guide catheter until it comes in contact with the stent; it then continues to push the stent into the biopsy port of the scope. During this phase the elevator on the scope is in the closed position until the stent reaches the end of the scope. The elevator is then opened and the stent is visualized endoscopically exiting the scope.
   f. It is important at this stage for the GI assistant to maintain constant tension on the guidewire and guide catheter to prevent looping in the duodenum, which is done by close endoscopic monitoring.
   g. Positioning of the guidewire and guide catheter is checked using fluoroscopy and then the stent is deployed by using the pusher and with the upward movement of the scope elevator. Proper positioning of the stent should be when the distal barb of the stent is 1 to 2 cm above the superior end of the stricture and 1 cm should protrude into the duodenum with the distal barb at the papilla. When using a double pigtail stent the proper position is when one pigtail is above the stricture and the other pigtail is in the duodenum at the papilla.
h. After proper placement has been confirmed, the Endoscopist holds the stent in place with the pusher catheter while the GI assistant removes the guide catheter and guidewire.

Self-Expanding Metal Stents

By
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Objectives:

At the conclusion of this presentation, the participant will be able to:

1. Identify two types of metal stents.
2. Describe at least one indication for the placement of both covered and uncovered metal stents.
3. Return demonstrate the equipment and verbalize the steps necessary to successfully deploy the devices.
**Biliary Metal Stents**
Endoscopic stenting is an established intervention for palliation of patients with unresectable malignant biliary strictures. Self-Expanding Metal Stents (SEMS) were introduced in the late 1980’s (Isayama, H., Komatsu, Y., Tsujino, T., Sasahira, N., Hirano, K., Toda, N, et al. 2004). Research has shown that SEMS provide longer patency when compared to plastic stents (ASGE, 2001). SEMS should be placed after determining unresectability, more than a single SEMS can be placed at one time and SEMS can be placed one inside the other. SEMS are intended to be permanent, removal is suggested only when displaced and fallen into the duodenum. SEMS are available in a variety of sizes and both covered or uncovered. Selection of the stent is based on location and disease. Covered SEMS, developed in the 1990’s, have been shown to protect against tumor in growth and retain their patency longer (Isayama, H., Komatsu, Y., Tsujino, T., Sasahira, N., Hirano, K., Toda, N, et al. 2004).

**Indications**
- Palliative treatment of inoperable malignant bile duct obstructions

**Choosing covered or uncovered**
- Uncovered
  - Hilar strictures
  - Cystic duct invasion
- Covered
  - Strictures in lower and middle part of bile duct
  - Limited tumor in growth

**Potential complications**
- Bleeding
• Cholangitis
• Pancreatitis
• Occlusion
  o Caused from tumor in growth and treated with balloon dilatation and/or additional plastic or metal stent placement
  o Biliary sludge treated with lavage, balloon extraction and/or additional plastic or metal stent placement
• Migration
  o Distal
  o Proximal
• Blockage of Cystic Duct

Equipment
• Biliary catheters/Spincterotome
• Guidewires
• Balloon dilators
• SEMS

Placement of Biliary SEMS
• Identify location and extent of stricture
• Transverse stricture with guidewire and maintain position
• Select appropriate stent size and type
• Inspect stent and delivery system for kinks, defects and expiration date
• Remove the catheter over the guidewire ensuring guidewire remains above the stricture (doing an exchange)
• Prepare the SEMS delivery system per manufacturer guidelines
• Advance the delivery system over the guidewire using fluoroscopic guidance
• Ensure proper placement by identifying radiopaque markers to bridge stricture
  o Note: SEMS should not extend more than 5mm into duodenum
• Deploy the SEMS per manufacturer guidelines under fluoroscopic guidance
• After the SEMS is correctly positioned and completely deployed, the delivery system and guidewire is removed

References


Direct Visualization System and Cautery

By
Kathleen van Gelder, MSN, RN
Shawn Simmonds, GI Tech

Objectives

At the conclusion of this presentation, the participant will be able to:

1. Identify indications for the use of direct visualization of the biliary system.
2. Identify components and assembly of direct visualization system.
3. Identify use of cautery, ERBE, in the ERCP
4. Describe the components of the ERBE machine and there indications.

Electrosurgical Cautery in the ERCP Procedure

- Using ENDO CUT 1
  ERBE machine layout
  Settings
Foot petal

- Monopolar high-frequency electrosurgical mode
  - Cutting cycle
    - Initial cutting phase & cutting phase
    - Coagulation cycle
- Papillotomy
  Papillotome

**ENDO CUT activation**

- Yellow footswitch (with activation sound signal)
  - Second signal during the cutting cycle (cut signal).
  - The footswitch should be pressed until the tissue is completely dissected.
ENDO CUT® I and ENDO CUT® Q

fractional cut

Cutting cycle

Cutting phase

Initial cutting phase

Coagulation cycle

U / Voltage

t / sec.
If cannulation is unsuccessful with the papillotome you may use a needle knife.
Papillotomy
Risks for Perforations

- Too much tension of the wire
- Too deep insertion of the papillotome
- Too much mechanical pressure by the endoscope
- A choice of cutting interval which was too long
- Continuous energy output for a too long period.
Direct Visualization

ERCP has been the procedure used to evaluate diagnosis and treat conditions of the gallbladder, bile ducts, pancreas, and liver. Endoscopic Ultrasound (EUS) has added diagnostic benefits. New technology, Spyglass direct visualization, allows us to look directly into the dark world of the bile ducts with a real time view.

Cholangioscopy has existed since 1976 and allowed examination of the bile ducts with use of a fiberoptic endoscope. Until recently, the procedure required two Endoscopists, one for each scope. SpyGlass® is designed as a single operator unit. Compared to traditional cholangioscopy, SpyGlass® has improved opticals, allows for accessory devices, increased maneuverability, and a dedicated irrigation channel. The enhanced visualization provides optically directed biopsies and catheter to stone contact for electrohydraulic lithotripsy (EHL).
SPYGLASS

Indications to Evaluation and Diagnosis:

- Gallstones
- Suspected malignancies
- Bile duct stricture
- Cystic lesions

Components:
- Capital Equipment
  - Processor
  - Monitor
  - Cart
  - EHL
- Single use Access and Delivery Catheter
- Direct Visualization Probe
- Single use Tissue Acquisition Device
- EHL probes
Spyglass DS

- Easy to assemble
- Disposable
- High Quality Images
- Improved patient outcome
Old SpyGlass setup

Connecting

focusing
Reusable vs Disposable

Old

NEW
See what your missing!
“Thank You”
From
CTSGNA

To our exhibitors who helped make the 2017 ERCP Workshop a wonderful success, and for donating the supplies used in this course!!

Note: CTSGNA does not endorse any particular product and receives materials for the purpose of teaching.