CAR Standards for Percutaneous GastroIntestinal Interventions

The standards of the Canadian Association of Radiologists (CAR) are not rules, but are guidelines that attempt to define principles of practice that should generally produce radiological care. The physician and medical high-quality physicist may modify an existing standard as determined by the individual patient and available resources. Adherence to CAR standards will not assure a successful outcome in every situation. The standards should not be deemed inclusive of all proper methods of care or exclusive of other methods of care reasonably directed to obtaining the same results. The standards are not intended to establish a legal standard of care or conduct, and deviation from a standard does not, in and of itself, indicate or imply that such medical practice is below an acceptable level of care. The ultimate judgment regarding the propriety of any specific procedure or course of conduct must be made by the physician and medical physicist in light of all circumstances presented by the individual situation.

I. INTRODUCTION AND DEFINITION

Percutaneous interventions to the gastrointestinal tract can be divided into three categories which include biliary, pancreatic and gastrointestinal. Most pancreatic interventions consist of cyst drainage and needle biopsy.

Gastrointestinal interventions consist of percutaneous gastrotomy/gastrojejunostomy for feeding and/or decompression and percutaneous cecostomies for large bowel obstruction. The most common biliary interventions consist of percutaneous biliary drainage (internal and/or external), stone extraction and expulsion in the duodenum through a transhepatic or T-tube track, common bile duct dilatation and/or stenting for benign and/or malignant strictures. Biliary interventions also include percutaneous cholecystostomy for external drainage, stone extraction and/or dissolution.

II. RADIOLOGIST QUALIFICATIONS

Physicians involved in the performance, supervision and interpretation of gastrointestinal interventional procedures should be Diagnostic Radiologists and must have a Fellowship or Certification in Diagnostic Radiology with the Royal College of Physicians and Surgeons of Canada and/or the Collège des médecins du Québec. Also acceptable are equivalent foreign Radiologist qualifications if the Radiologist is certified by a recognized certifying body and holds a valid provincial license.

As new imaging modalities and interventional techniques are developed additional clinical training, under supervision and with proper documentation, should be obtained before radiologists interpret or perform such examinations or procedures independently. Such additional training must meet with pertinent provincial/regional regulations. Continuing professional development must meet with the requirements of the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada.

III. BILIARY INTERVENTIONS

A. INDICATIONS AND CONTRAINDICATIONS

1. Indications
   - suspected obstructive jaundice
   - suspected biliary sepsis
   - cholelithiasis
   - post-traumatic or iatrogenic common bile duct obstruction or leak
   - suspected cholecystitis or hydrops in the nonsurgical (high risk) patient
   - symptomatic gallstones in the patient who refuses surgery
   - failed endoscopic biliary tract imaging

2. Contraindications
Contraindications for biliary tract interventions are relative and include:
   - bleeding diathesis: if this cannot be corrected by the administration of vitamin K or fresh frozen plasma, endoscopic approach to biliary tract drainage would then become the treatment of choice

   - a history of life threatening reactions to all available choices of iodinated contrast material would make an endoscopic or ultrasound approach neccessary
- ascites - would require prior paracentesis or a left hepatic duct approach

**B. TECHNIQUE FOR BILIARY INTERVENTIONS**

**Approach and Methods**

Biliary interventions have been carried out under fluoroscopic, ultrasound and endoscopic control.

Transhepatic biliary interventions under fluoroscopic guidance are usually from a right lateral or from an anterior approach for left hepatic duct puncture.

Drainage and opacification of the biliary tract is then carried out through either a single or double stick technique.

From then on, the various biliary interventions (catheterization, stone extraction/expulsion, stent placement, etc.) are carried out essentially along the principle of the Seldinger technique.

Even with early symptomatic relief, it is considered wise to maintain a biliary catheter in position for approximately ten days. If catheter removal is considered prior to track maturation, occlusion of the catheter track should be considered to prevent leakage into the peritoneal cavity.

**COMPLICATIONS**

Complications of biliary drainage can be divided into acute and delayed.

**Acute Complications (5 - 10% of procedure)**

The most common acute complications are related to hemobilia and sepsis. Hemobilia after percutaneous transhepatic biliary drainage has been reported as having an incidence ranging from 3.7 to 13.8%. Acute septic shock has been reported as occurring in 3-5% of patients. These major acute complications can result in a death rate ranging from 0.5% to 5.6%. Less common acute complications would include pneumothorax, bilithorax, pancreatitis, subphrenic abscess and peritonitis.

**Delayed Complications**

Delayed complications are more common and occurring in 40-50% of cases depending upon the length of time the catheter is left in the biliary tract. These include:

- cholangitis
- bile leakage
- dislodgement of catheter
- wound infection

All of these complications should be recognized early for prompt correction.

**OTHER GASTROINTESTINAL INTERVENTIONS**

**A. Indications for:**

1. Gastrojejunostomies/jejunostomies for feeding:
2. Dysphagia secondary to local or CNS causes
3. Chronic or recurrent aspiration pneumonias
4. Obstructing esophageal or gastrointestinal lesions
5. Inability to ensure adequate nutrition by either oral or nasogastric intake

Gastrojejunostomies/jejunostomies for decompression with or without concommitment feeding:

- Recurrent small bowel obstruction secondary to carcinomatosis.

Percutaneous cecostomy:

- large bowel obstruction
- cecal volvulus
- pseudo-obstruction (Ogilvy syndrome)

**B. CONTRAINDICATIONS**

The contraindications for gastrointestinal interventions are relative and include:

1. coagulopathy
- ascites
- lack of a safe percutaneous access to the stomach or cecum

**IV. TECHNIQUE AND METHOD**

Percutaneous gastrotomy/gastrojejunostomies and percutaneous cecostomies are interventions carried out mostly under fluoroscopic guidance. Many techniques have been described, some puncturing the stomach/cecum and then using a Seldinger exchange for track dilatation and catheterization. Another method is consisting of a trochar peel-away introducer for a one stick technique. For gastrotomy/gastrojejunostomies, stomach insufflation is necessary and, when possible, the patient should have a nasogastric tube inserted for this purpose.

**V. COMPLICATIONS**

Complications associated with percutaneous gastrointestinal interventions are reported at about 1-2%. They include: peritonitis, hemorrhage and wound infection. Death has been reported in 1% of cases.

**REFERENCES**


HO, CS, Yeung, EY: Percutaneous Gastrotomy and Transgastric Jejunostomy, AJR 1992; 251-257
