

Fundamental of Endoscopic Surgery: Online Study Guide

Module 4 – Upper Gastrointestinal Endoscopy

Learning Objectives

After finishing this module, you will be able to:

- Understand the indications for and contraindications to upper endoscopy
- Describe patient positioning and room setup for an endoscopic procedure
- Describe how to perform diagnostic upper endoscopy
- Describe when surveillance and screening are indicated for upper endoscopic procedures
- Describe complications that may arise from upper endoscopic procedures
- Identify normal anatomy commonly found in upper endoscopic procedures
- Identify pathology commonly found in upper endoscopic procedures

Indications

Introduction

Upper endoscopy is used to:

- Examine the mucosa of hollow organs from the esophagus to the proximal small intestine
- Discover significant abnormalities
- Remove or biopsy all lesions encountered that require further definition

Any endoscopic procedure should be done in a safe fashion without added patient risk. When a safer but equally effective method can be employed, the need for endoscopy should be questioned.

Endoscopy should only be done when the findings will change the patient's management. Endoscopy is also indicated if alternate methods of examining the organ, such as with X-ray studies, have a lower sensitivity or specificity. Periodic follow-up of healed benign disease is generally not indicated, except for research purposes, such as ulcer recurrence rates following ulcer operations.

Upper endoscopy may be performed to define abnormal barium studies, often at the suggestion of the radiologist. These studies should always be reviewed by the endoscopist prior to the procedure.

Diagnostic Endoscopy

Indications for upper endoscopy can include the following:

- Failed treatment with proton pump inhibitor (PPI) for one month
- Failed treatment of positive helicobacter pylori (*H. pylori*) antibody titer
- Poor response to stopping NSAIDs for 10 days
- Anorexia
- Anemia
- Weight loss > 10 lbs over 12 weeks
- Persistent vomiting or signs and symptoms of an upper GI obstruction
- Dysphagia
- Odynophagia
- Persistent or recurrent symptoms of esophageal reflux on appropriate therapy
- Recurrent esophageal reflux symptoms while on maintenance PPI
- Suspected post-gastrectomy ulcer or stricture
- Long-standing GERD without prior endoscopy
- Occult GI blood loss
- Hematemesis, melena, hematochezia
- Preoperative assessment for patient undergoing roux-en-Y gastric bypass

Surveillance

The following indications should trigger surveillance with endoscopy:

- Familial polyposis
 - Every 1 to 2 years
- Barrett's esophagus
 - See the next screen for more information
- Esophageal varices following sclerotherapy and banding
 - Every 6 to 8 weeks
- Gastric ulcer
 - Every 6 weeks until healed with biopsy and brushings
- Esophageal ulcer
 - Every 6 weeks until healed with biopsy and brushings

ASGE guidelines do not recommend screening for diagnoses of gastric atrophy, including intestinal metaplasia without dysplasia, treated achalasia, or a history of gastrectomy. Patients with pernicious anemia should have a single endoscopy with no follow up.

Barrett's Esophagus

Surveillance or screening esophagogastroduodenoscopy (EGD) is indicated in Barrett's esophagus for:

- Low risk
 - Short segment (less than 3 cm)
 - No dysplasia
 - Surveillance every 2 years
- High risk
 - Long segment (greater than 3 cm)
 - Circumferential
 - Surveillance yearly
- High risk
 - Low grade dysplasia
 - Surveillance every 6 months

Current literature suggests endoscopic or surgical resection or ablation for high-grade dysplasia. Follow-up EGD should not be performed on patients who have recently had a myocardial infarction.

Abnormal Radiologic Studies

The following abnormal radiologic studies should be evaluated with endoscopy:

- Suspected neoplastic lesion, ulcer, or stricture
- Mucosal wall thickening or irregularity
- Duodenitis in patients with Crohn's disease
- Equivocal duodenal findings in patients with prior history of duodenal ulcer

Contraindications

The following are contraindications for diagnostic EGD:

- Patient unable to tolerate sedation
- Inadequately resuscitated or hemodynamically unstable patient

In addition, the following are **NOT** indications for diagnostic EGD:

- Atypical, non-progressive and chronic abdominal distress due to functional problem
- Uncomplicated reflux responsive to medical therapy
- Metastatic adenocarcinoma when findings will not influence treatment plan
- Evaluation of asymptomatic benign findings on radiologic study

Preparation

Patient Preparation

The patient should take nothing orally for 6 to 8 hours prior to an upper endoscopic exam. Guidelines for obtaining informed consent should be followed, including a discussion of the procedure, indication(s), potential findings, and risks. For more information about informed consent, see FES Module 2: Patient Preparation.

Appropriate pre-procedure assessment should be performed, and the patient's dentures, if present, removed.

If topical anesthetic is desired, especially for patients undergoing unsedated endoscopy, the throat may be sprayed with several doses of a variety of topical agents.

Room Preparation

The endoscopist should check the endoscopic equipment as detailed above in Module 1: Technology.

The room should include the following supplies:

- Biopsy forceps
- Snares
- Polyp trap
- Sclerotherapy catheters
- Bipolar catheters
- Heater probes
- Dilators (Maloney, Savary, and balloon)
- Foreign body tools, such as grasping forceps, basket, and a Roth net

In addition, energy sources, such as electrosurgical generators or a heater probe box should be available.

If a PEG tube placement is planned, the kit should be available in the procedure room.

Patient Position

The patient should be placed lying down on their left side with their head slightly elevated and positioned near the endoscopic tower.

At times it is necessary to turn over the patient so that their right side is down. This is usually necessary when performing an EGD for an acute UGI bleed, because blood will pool in the fundus and may hide a Dieulafoy lesion in the fundus.

Rolling the patient so that their right side is down will empty the fundus of blood and clot and allow a complete exam.

Diagnostic EGD

Insertion

The endoscope can be inserted under direct visualization, which is the preferred method, or by blind passage.

With blind passage, the bite block is pre-loaded on the endoscope and then:

- The endoscopist pulls the base of the tongue forward with two fingers.
- The endoscopist slides the scope beneath the fingers and deflects it toward the cricopharyngeus.

The patient is asked to swallow, and the endoscope is pushed gently into the proximal esophagus.

Direct Visualization

When inserting the endoscope under direct visualization, first rotate the scope so that it deflects inferiorly in the midline when placed in front of the bite block and the controls are dialed upward.

Next, the endoscopist should:

- Place the tip of the endoscope in the neutral position
- Insert the scope until the posterior pharyngeal wall of the oropharynx is encountered.
- Dial the tip upward, pulling it around the base of the tongue and placing it at the level of the epiglottis.
- Deflect the tip gently downward, allowing it to hug the posterior hypopharynx and advance to the level of the arytenoid cartilages, which should be at about 15 cm.

Finally, ask the patient to swallow, and push the endoscope gently into the proximal esophagus. Having the patient's chin tilted toward the chest may also facilitate entry of the scope into the esophagus.

It is important to realize that the patient's swallowing will not pull the endoscope into the esophagus. The endoscope must be pushed gently into the esophagus to traverse this region.

Esophagus

Advance the endoscope straight through the esophagus into the stomach, taking care to inspect carefully at all times.

It is important to examine the distal esophagus for erosions or erythema at this stage, as the remainder of the exam may alter the appearance of this area and make later examination inaccurate.

The distances from the bite block to the level of the Z line, the gastroesophageal junction, and the diaphragmatic pinch (determined by having the patient sniff), are all crucial to determining whether the patient has a hiatal hernia or Barrett's esophagus and should be noted as you advance the scope.

Stomach

Once you enter the body of the stomach, suction dry the gastric pool of secretions. Then straighten the endoscope and hold it at a right angle to the patient.

With continued insufflation and advancement of the endoscope, you will see the antral/body junction, and then the pylorus, which will often be oriented at the 1 to 2 o'clock position on the screen.

Advance the endoscope toward the pylorus, keeping it centered at all times. As the scope advances along the greater curve of the stomach, the position of the pylorus on the viewing screen will change from the top to the center.

You may lose visualization of the pylorus as you near it. If this occurs, withdraw the endoscope until you can see the pylorus. Then make another attempt at intubating the pylorus while keeping it in view.

Often, you may need to apply gentle pressure or even mild deflection of the tip to the right to pass through into the duodenum.

Duodenum

Once the endoscope has entered the duodenum, examine the bulb carefully.

If the bulb was not seen well during this initial passage through the pylorus:

- Pulling the endoscope back 1 to 2 cm before trying to examine the bulb reduces the tendency to be pulled further into the descending duodenum.
- Re-insert the endoscope into the bulb

Upon reaching the sharp turn of the superior angle of the duodenum, flip the endoscope around the superior angle by simultaneously:

- Dialing up
- Dialing right
- Twisting the shaft of the endoscope clockwise (right-hand maneuver)

Once you have passed the superior angle of the duodenum you can see the descending duodenum with occasional visualization of the ampulla of Vater. Advance further by withdrawing the endoscope while maintaining clockwise torque on the shaft and keeping the lumen centered. The shape of the endoscope will change from the long (or greater curve) configuration to the short (or lesser curve) configuration.

From here, further advancement into the distal duodenum and proximal jejunum is possible, if necessary, to rule out celiac disease or jejunal arteriovenous malformations (AVMs).

Antrum to GE Junction

Withdraw the endoscope back into the antrum, and perform a J maneuver by deflecting the tip of the endoscope all the way up (and to the left as well if using an older endoscope).

Once you can see the incisura:

- Rotate the shaft of the endoscope counterclockwise and withdraw, pulling the endoscope into the proximal body and cardia
- Rotate the endoscope 360° around the gastroesophageal (GE) junction, achieving full visualization of this region
- Note the grade of the flap valve

Flexion and extension of the left wrist and rotation of the shaft of the endoscope help make the maneuver to view the GE junction possible with minimal effort.

Withdrawal through Stomach

Straighten the endoscope by dialing the tip down then examine the stomach while withdrawing the endoscope.

Often, at this time, biopsies are obtained, and the measurements of the position of the GE junction landmarks can be determined, if not determined on entry. Precise measurements and documentation of these measurements are critical to a quantitative EGD that is useful for the surgical care of the patient.

The endoscopist should strive to create documentation that would allow a surgeon in another community to see exactly what the anatomy and pathology of the patient are should the patient move.

If there is a lesion on the lesser curve of the stomach or periampullary region of the duodenum that is difficult to see, or cannot be approached directly, try using a side-viewing endoscope. This allows en-face visualization of the lesion with accurate biopsies and brushings.

Complications

Sedation

Complications during an endoscopic exam can arise due to excessive sedation, with loss of airway, oxygenation, or hypotension, and are discussed in Module 3: Sedation & Analgesia.

These complications can be compounded in a patient receiving an EGD, because the bite block used to protect the endoscope also pushes the jaw and tongue posteriorly. In essence, the bite block acts as a reverse jaw thrust and creates a higher risk of airway obstruction.

Aspiration

Aspiration may complicate EGD. When the patient is sedated, there is loss of protective reflexes accompanied by gastric insufflation increasing the risk of aspiration; this is especially true in patients with GERD.

Carefully observing the following may help to prevent a significant aspiration episode:

- The degree of gastric distention
- The level of sedation
- Proper head elevation
- Removal of fundic gastric pool
- Decompression prior to scope withdrawal

GI Tract Perforation

Perforation of the GI tract is a significant danger in endoscopy. The risk of perforation can be decreased by ensuring you visualize the lumen during advancement of the endoscope and avoiding excessive force during insertion.

Some regions require special attention:

- Advancement through the cricopharyngeus (blind)
- Pharynx (examine directly to avoid entry into the Zenker's diverticulum)
- Superior duodenum

Signs of possible perforation include:

- Cervical crepitus
- Substernal pain
- Abdominal pain and rigidity

If a perforation is suspected, then a water-soluble contrast upper gastrointestinal study should be promptly performed, since immediate intervention produces a better outcome.

Bleeding

Bleeding can occur if coagulopathies are not reversed prior to an EGD when biopsies or polypectomies are planned.

In addition, injudicious use of biopsy, such as in the region of exposed blood vessels or over varices can lead to disaster. Only mucosal lesions should be biopsied or removed to avoid significant bleeding or perforation.

Generally speaking, submucosal lesions are best studied by endoscopic ultrasound (EUS), with ultrasound-guided biopsies.