

## **Anesthetic considerations for POEM Procedure**

POEM= Per-Oral Endoscopic Myotomy

### Indications for procedure:

The patient's generally have symptoms of achalasia include dysphagia and chest pain. Esophageal manometry indicates an absence of peristalsis. Some patients may have a greatly enlarged esophagus, called sigmoid. These patients with sigmoid esophagus may have solid food trapped in the distal esophagus, which may require endoscopy to move this food prior to the start of the POEM procedure.

### Description of procedure:

The POEM procedure is an endoscopic procedure to improve symptoms in patients with achalasia. These patients experience dysphagia, delayed emptying of food contents in the esophagus and stomach and experience odynophagia and chest pain. The POEM procedure involves the endoscopic evaluation of the esophagus and stomach.

After irrigation of the esophagus with antibiotic containing solution, an endoscope is passed into the esophagus. Distention is accomplished using CO2 insufflation of the esophagus and submucosal tissues. An incision is then made in the midportion of the esophageal mucosa. The location of this incision is generally in the 2 o'clock to 5 o'clock position. This position avoids such posterior structures as the aorta. The posterior approach may be more useful as a redo procedure. The posterior location is identified by the pooling of fluid due to gravity. Note that the tunnel formation may be more difficult if there has been prior BOTOX injection or prior dilatation of the lower esophageal sphincter.

The equipment necessary for the poem procedure are that ERBE water jet, CO2 insufflation device, methylene blue with either hyaluronic acid or dextrose. The methylene blue dye stains the submucosa blue but will not stain the muscle, thus helping to delineate the planes for creating the tunnel. A submucosal tunnel is then made toward the stomach. This part of the procedure requires the placement of an esophageal overtube or cap. Note that there has been a complication of loss of the cap in the submucosal tunnel. The submucosal tunnel can be performed by using the waterjet or by balloon dissection. At the level of the stomach, a myotomy is performed to divide the circumferential fibers of the lower esophageal sphincter. The myotomy is intended to occur at the level of the clasp fibers of the lower esophageal sphincter near the lesser curvature of the stomach. Myotomy in this position preserves the sling fibers at the greater curvature of the stomach and thereby preserves the angle of Hiss and minimizes the chance of reflux after the POEM procedure.

Confirmation of tunnel extension through the entire GE junction and into the cardia of the stomach can be confirmed through a retro flex view of the Cardia using an endoscope. Often an Argon Beam Plasma Coagulator is employed to create the myotomy and to provide hemostasis. The esophageal mucosal layer is then closed using endoclips. The end of clips are placed starting with the distal end of the incision.

The advantages of the poem procedure over the laparoscopic approach are that a greater extent of the esophagus is able to be reached. With the laparoscopic approach, only the level of the esophagus at the level of the inferior pulmonary vein can be reached. Complications of the POEM procedure include pneumoperitoneum in 8% of patients, in one series. To date, about 1000 POEM procedures have been performed world-wide.

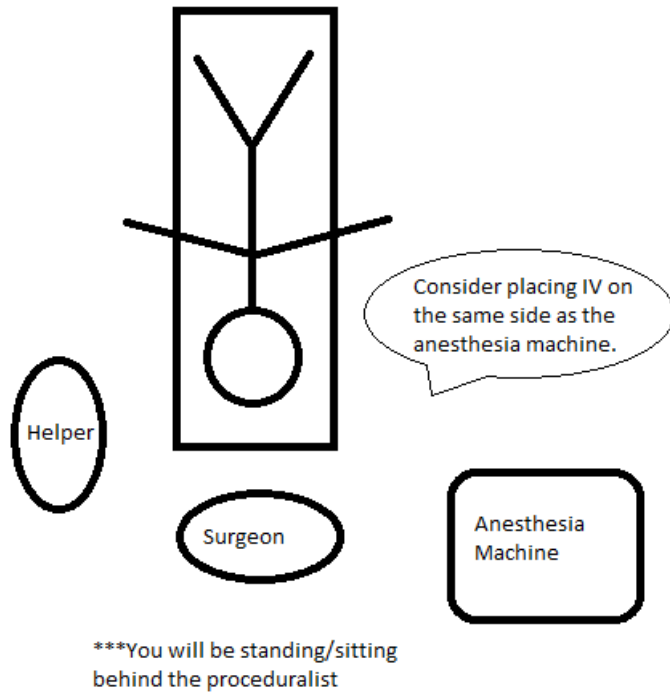
#### Anesthesia for POEM:

The anesthetic technique is a general anesthetic with the placement of an endotracheal tube. Because of the risk of aspiration of food contents, the induction is usually a rapid sequence induction using cricoid pressure. Patients are maintained on inhalational agents, muscle relaxants are given throughout the procedure. IV analgesics are given as needed, but keep in mind this type of procedure is relatively non-stimulating. The patient is NPO for 8 hours before the procedure, and may even be on a liquid diet for days before, to assure little solid and particulate matter in the stomach prior to the start of the procedure. The risk of aspiration exists at the induction and emergence of the anesthetic agent, especially during extubation.

Monitoring during the procedure includes monitoring of the peak airway pressure. The peak airway pressure should remain below 20 cm of water. Increased peak airway pressure may indicate abdominal distention. If too much tension is caused by abdominal distention, a Veress needle may need to be inserted into the abdomen to decompress the free air. The neck should be checked repeatedly for signs of crepitus. Tension pneumothorax can occur along with pneumomediastinum resulting in hemodynamic compromise.

#### Anesthetic protocol:

- Positioning:
  - Patient will be in the supine position with arms out by the side
  - After intubation, the surgeon/endoscopist will be at the head of the bed, an assistant may stand next to the surgeon
  - Consider starting the IV on the same side as the anesthesia machine (see figure)
  - Consider placing an extension on your IV tubing
- Monitoring:
  - Standard ASA monitoring
  - Consider using an axillary temperature probe to avoid monitors in the nose/mouth
  - Placement of an arterial line may be warranted to closely monitor for hemodynamic compromise secondary to complications of insufflation
- During the procedure:
  - Redose NMBs as needed, be judicious with narcotics
  - Monitor peak airway pressures (<20 cm H<sub>2</sub>O) and signs of developing crepitus
- Other considerations:
  - Lower body Bair hugger and a Foley catheter if indicated
  - The overall procedure takes between 2 to 5 hours



Recovery:

The patient is usually admitted and remains NPO for the first 24 hours postoperatively. Following this period, the patient will continue on a full liquid diet as tolerated for a week.