

Rigid Upper Esophagoscopy

Richard Davis

Introduction:

As technology developed and flexible fiberoptic upper endoscopy became more widespread, rigid esophagoscopy became less commonly used. The advantages of flexible over rigid esophagoscopy include less anesthesia requirement and less risk of perforation or other iatrogenic injury. Another advantage of a flexible fiberoptic approach is increased visualization, as rigid esophagoscopy involves examination through a long narrow metal tube.

One distinct location where rigid esophagoscopy is in the “back of the throat,” including the oropharynx, hypopharynx, upper esophageal sphincter, and cervical esophagus. It is difficult to visualize this area well on flexible endoscopy, even with adequate topical and intravenous sedation anesthesia, due to the gag reflex. Without general anesthesia, it is practically impossible to perform any significant intervention, such as foreign body removal or biopsy of lesions above the upper sphincter.

The indications for rigid esophagoscopy include: Foreign body removal from the oropharynx, hypopharynx, or cervical esophagus, or other intervention at the cervical esophagus such as biopsy or dilation. It can also be performed as part of a direct operative laryngoscopy and biopsy, as the surgeon inspects all of the upper aerodigestive tract. Another potential indication is need to examine any of the esophagus, in the absence of a flexible esophagoscope. While it is possible to perform rigid endoscopy all the way to and through the lower esophageal sphincter, this is progressively more difficult the farther one goes. In a low-resource setting without access to a flexible scope, this would be an acceptable alternative, supplemented with barium upper gastrointestinal studies to assess the stomach and duodenum.

Rigid esophagoscopes generally come in various lengths; it is advisable to use the shortest one possible, as visualization and instrumentation becomes more difficult with longer tubes.



47cm rigid esophagoscope with attachment for fiberoptic light cable (Red Arrow,) suction cannula of suitable length (Top) and brush for cleaning (Bottom.) The upper forceps is for biopsy and the lower two are for foreign body removal. The entire esophagus to the gastroesophageal junction can be inspected with this scope.

If one is attempting to visualize only the hypopharynx, upper sphincter, and the first 5cm of the cervical esophagus, it is quite acceptable to use a #4 or larger Miller (straight blade) laryngoscope. This allows one to use the Yankauer suction and the Magill forceps. We frequently use this strategy when removing foreign bodies, when they are lodged in the hypopharynx or at the upper esophageal sphincter.



The 4 Miller laryngoscope's blade is a straight lighted tube. It can be used to inspect, biopsy, or remove foreign objects from the hypopharynx, upper esophageal sphincter, and first 5cm of the cervical esophagus.

The steps of rigid esophagoscopy consist of:

- Induction of general anesthesia and intubation

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- Extending the neck using a head ring and shoulder roll
- Insertion of the scope and advancement under direct visualization
- Biopsy or intervention
- Repeat inspection to confirm hemostasis or complete removal of the object without perforation.

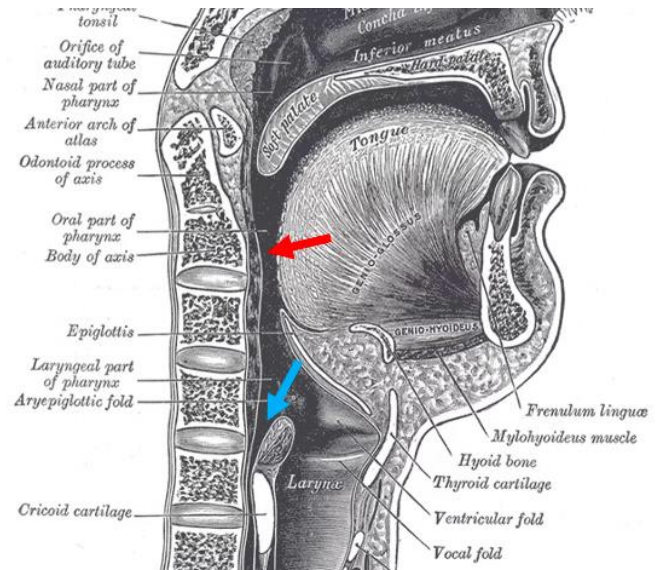
Steps:

1. Ask the patient to extend the neck to assess range of motion. This helps to avoid injury by hyperextension once the patient is anesthetized.
2. Induce general anesthesia and intubate. Communicate the anticipated length of the procedure to avoid inappropriate administration of a long-acting anesthetic or paralytic.
3. Extend the neck using a head ring and shoulder roll. To avoid iatrogenic injury, make sure the head is resting solidly on the head ring and cannot be rotated or extended further. See Pitfalls, below.

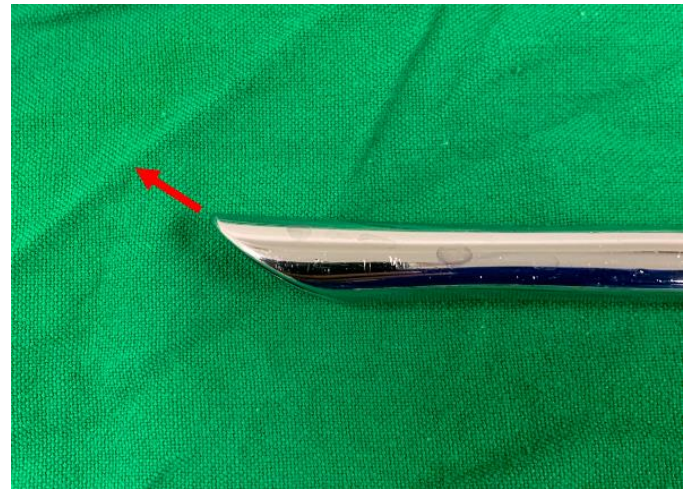


Extension of the neck with a head ring and shoulder roll allows the passage of a straight instrument through the mouth, down the esophagus all the way to the gastroesophageal junction.

4. Rotate the table 90 degrees away from the anesthesia station to allow the surgeon room to maneuver. Raise the table to a comfortable height or sit on a stool.
5. Insert the scope with the bevel facing downward until the tip contacts the posterior oropharyngeal mucosa.



Insert the scope through the mouth with the bevel facing posteriorly. When the tip reaches the mucosa of the posterior oropharynx (Red arrow) advance it in a caudal direction while maintaining gentle pressure in a posterior direction. Keeping the scope in the midline directs its tip into the upper esophageal sphincter (Blue Arrow.)



The beveled tip of the scope faces posterior, allowing the scope to be gently advanced in the direction shown by the Red Arrow.

6. Taking care to avoid injury to the upper incisors, direct the tip of the scope in a caudal direction while applying gentle pressure against the posterior oropharynx and hypopharynx. Keep the tip of the scope in the midline as you advance. Use a folded gauze or an athletic mouthguard to protect the teeth.
7. You will encounter some slight resistance at the upper esophageal sphincter. Stop at this point, pull back slightly, and direct the scope to the left

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and right to inspect the pyriform sinuses, a frequent location for foreign bodies to become impacted. Be sure to remain posterior to the endotracheal tube to avoid dislodging it.

8. Return to the midline and insert the scope into the esophagus as far as needed.
9. Use retrieval forceps, suction, or biopsy forceps to perform an intervention.
10. Inspect biopsy sites or sites of foreign body impaction to confirm hemostasis or lack of deep injury to mucosa.

Pitfalls

- If patient has trismus, a short wide neck, or decreased range of neck mobility, you may not be able to extend their neck sufficiently to allow a straight scope to pass into the esophagus. Assess the neck range of motion prior to induction of anesthesia.
- When a shoulder roll is in place, the neck will be extended. The head ring should be at a level that it supports the head. The head should not be supported by the vertebral column. Once the head ring is in place, assure that it supports the head by pushing gently downwards on the forehead. If the head moves downwards, you are hyperextending the cervical spine. Place some stacked blankets under the head ring to raise it up until it is supporting the head. Serious injury can result from neglecting this step!

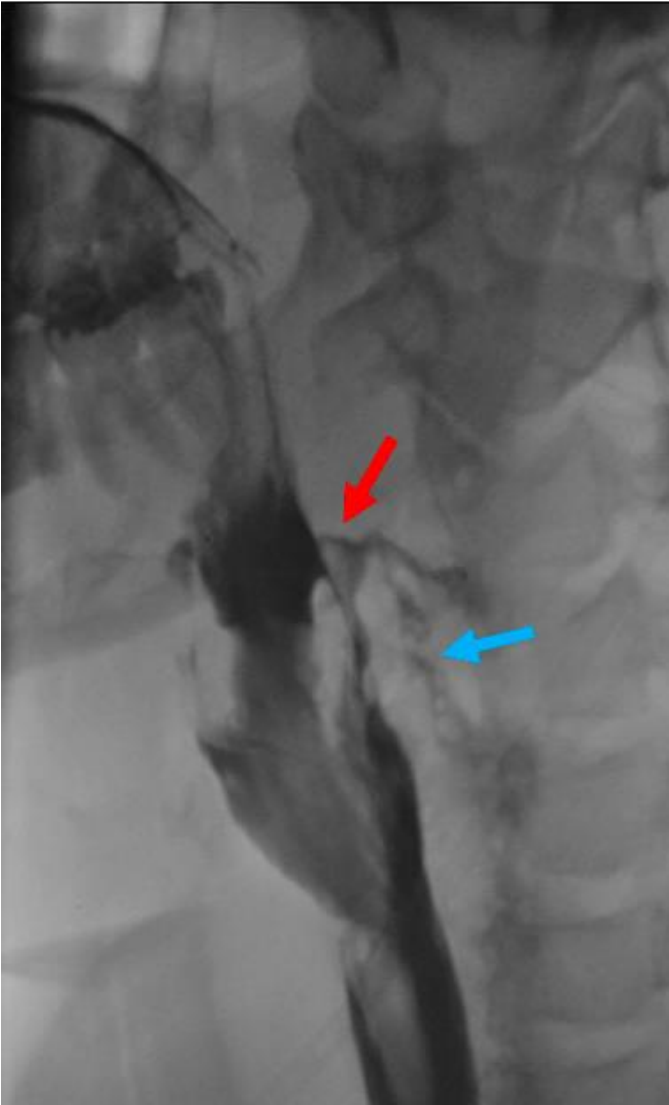


Pushing gently downward on the patient's head after extension of the neck with a head ring and shoulder roll. If the head moves

further, it is supported by the cervical spine and not the head ring. The head ring should be raised to avoid this situation.

- The scope can chip or fracture the upper incisors or lacerate the upper lip, especially as the surgeon's attention is directed deeper in the throat. The less the patient can open their mouth or extend the neck, the more likely this is. A soft rubber mouthguard from a pharmacy or sporting goods store can protect this area. Patients with loose upper incisors should be advised that some injury may be unavoidable.
- Anesthesia may seem sufficient until a scope is inserted into the throat, triggering the gag reflex. Stop and wait for the anesthetist to deepen the anesthesia.
- The hypopharynx or cervical esophagus can be lacerated by careless suctioning, deep biopsy, or the presence of a foreign body for 24 hours or more. Be very mindful of this complication and inspect carefully upon completing the endoscopy. Use Barium esophagoscopy to rule out perforation or to assess the depth of perforation and presence of extravasation.
- In case of perforation, have a very low threshold for surgical exploration and repair. If a contrast study shows passage into the parapharyngeal space or mediastinum, exploration is mandatory. Simply making the patient "NPO" is not sufficient, as the average adult swallows 1.5L of saliva per day. Neck exploration for esophageal perforation is discussed in a separate chapter.

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Lateral view Barium swallow study shows extravasation of contrast from the posterior hypopharynx area. The Red Arrow shows the point of extravasation, and the Blue Arrow shows passage of the contrast inferiorly into the mediastinum. This patient will require surgical exploration, debridement, and repair of the perforation. Case courtesy of RMH Core Conditions, <https://radiopaedia.org/?lang=us> From the case <https://radiopaedia.org/cases/26313?lang=us>

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