

Combined Esophageal Bougie-Endoscope

Purpose. The combined esophageal bougie-endoscope will aid in the identification and visualization of the esophagus during laparoscopic operation, and it also will provide a tube of metered diameter around which a fundoplication may be constructed.

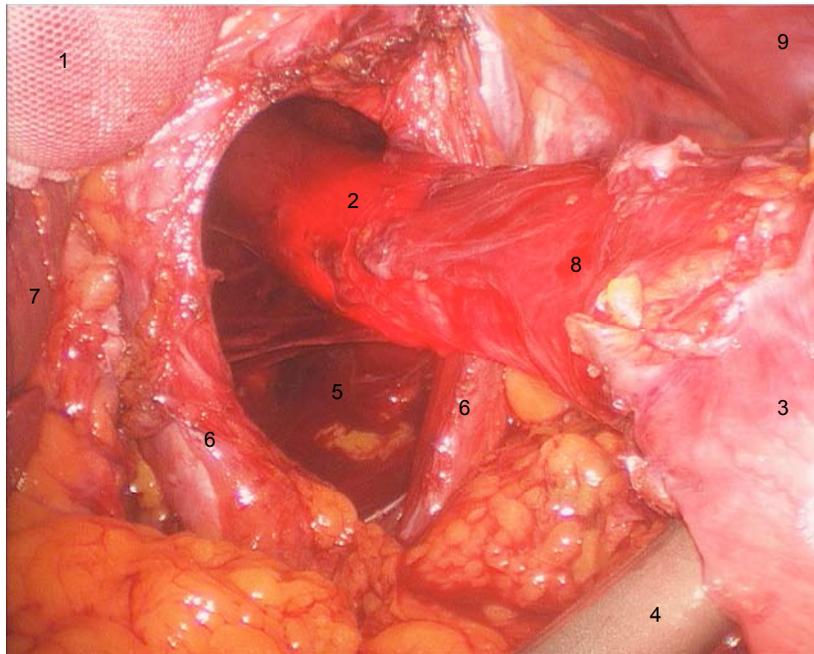
Statement of Need. The laparoscopic antireflux procedure (such as the Nissen fundoplication) continues to be a common therapy for complicated gastroesophageal reflux disease. Dissection of the esophagus in these cases can be difficult, especially in the presence of a hiatal/paraesophageal hernia. Such dissection can be aided by intraluminal illumination of the esophagus with a fiberoptically-lit bougie (Figure 1). The bougie also is helpful in the proper construction of the fundoplication by providing a tube of sufficient diameter (generally 60 Fr) around which the wrap is made. This prevents the creation of an overly-tight wrap, which can be debilitating to the patient in the postoperative period. Unfortunately, passage of such a bougie has the risk of inadvertent esophageal perforation. This is a disastrous and well-known complication of antireflux surgery. Many surgeons have foregone the use of the bougie out of fear for this complication. It would be of benefit to the esophageal surgeon to have an improved, safer bougie device for antireflux and other esophageal procedures.

Description. The combined esophageal bougie-endoscope (Figure 2) has the appearance and function of a conventional esophagogastroduodenoscope (EGD), except that the scope's shaft is much thicker (60 Fr, or 20 mm, diameter). In addition, the distal one-third of the scope's shaft is fiberoptically lit. In practice, the combined esophageal bougie-endoscope would be passed into the oropharynx, down the esophagus, and into the stomach by the anesthetist during (for example) a laparoscopic Nissen fundoplication. The shaft portion of the bougie-endoscope then could be illuminated, allowing for easier identification and protection of the esophagus by the surgeon. The bougie-endoscope also would be in place during construction of the fundoplication, thus functioning as a gage of wrap tightness, as describe above. Since the anesthetist can advance the bougie-endoscope while viewing the progress of the scope's tip on a monitor, the risk of inadvertent esophageal perforation should be minimal. At the end of the antireflux procedure, the quality of the wrap can be inspected with the bougie-endoscope as is done with a conventional EGD.

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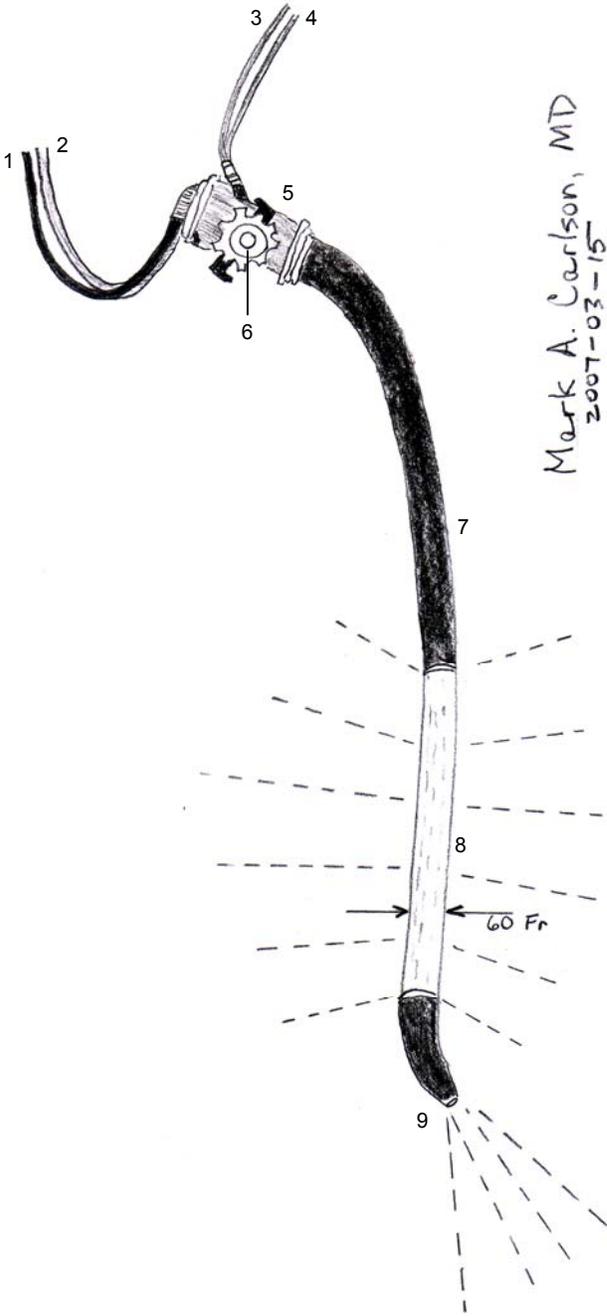
Figure 1: esophageal illumination with a lighted bougie



Key

1. Inflatable balloon retractor
2. Distal esophagus illuminated by a conventional fiberoptic bougie
3. Proximal stomach
4. Shaft of a laparoscopic grasper (diameter = 10 mm)
5. Esophageal hiatus of the diaphragm
6. Crural bundles
7. Caudate lobe of liver
8. Gastroesophageal junction
9. Diaphragm

Figure 2: Combined Esophageal Bougie-Endoscope



- Key
- 1. Camera cable
 - 2. Fiberoptic cable
 - 3. Suction line
 - 4. Irrigation line
 - 5. Scope head
 - 6. Scope controllers
 - 7. Shaft of scope
 - 8. Fiberoptically lit region of shaft
 - 9. Tapered end of scope

Sent 16 April 07

Subject: Suggested additional Design for Carlson Bougie

Name of Invention - Combined Esophageal Bougie-Endoscope

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Background: An invention proposed by Mark Carlson modifies the design of an endoscope to allow illumination from the shaft of the endoscope which will be modified to serve as an illumination bougie and also allow viewing from the distal end of the endoscope.

Proposal: I propose an additional design to compliment the Carlson Bougie whereby the currently used illuminated bougie is modified by moulding it with a tube (hole) existing through the middle of the illumination boogie. This tube (hole in the middle) will accommodate an existing endoscope.

This will accomplish allowing illumination of the esophagous and also allow viewing from the distal tip.

Advantages:

1. This would allow existing endoscopes to be used for viewing with this bougie.
2. Manufacture would be very easy by minor modification of the currently used mold for the illumination bougie.
3. Various length endoscopes could be used by this method giving more flexibility in the procedures which could be performed endoscopically using the endoscope.