

# Foregut and Colonic Perforations



## Practical Measures to Prevent and Assess Them

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### KEYWORDS

• Perforation • Colonoscopy • Endoscopy • Complication • Foregut • Colon

### KEY POINTS

- Foregut and colonic perforations are rare adverse events during upper endoscopy or colonoscopy, but can cause significant morbidity and mortality when they occur.
- The endoscopist can take several measures to minimize the risk of procedure-related foregut and colonic perforations.
- A high index of suspicion is necessary for early, accurate, and thorough assessment of foregut and colonic perforations.
- Early diagnosis and assessment of perforations is critical in improving complication-related patient outcomes.

### GENERAL PRINCIPLES: PREVENTION OF ACUTE ENDOSCOPIC PERFORATIONS

Like death and taxes, iatrogenic bowel perforation is a near certainty at some point during the life of a gastrointestinal (GI) endoscopist. Even the most skilled endoscopist who adheres to all of the principles of prevention will almost certainly face a situation whereby he or she has caused a foregut or colon perforation during endoscopy. Therefore, one should more realistically think of the clinical principles and pearls presented in this article as approaches to minimizing risk, as the only guaranteed way to avoid a perforation is to not perform the endoscopy at all.

#### *Minimizing Risk of Perforation: General Principles*

- Is the endoscopy indicated?
- Be prepared
- Know your limits
- Institute ongoing quality improvement programs

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**Box 1****Frequency of acute endoscopic perforations**

- Esophagogastroduodenoscopy: 0.05% to 0.1%
- Colonoscopy: 0.01% to 0.3%
- Endoscopic ultrasonography: 0% to 0.4%
- Endoscopic retrograde cholangiopancreatography: 0.5% to 1.5%

Perforation rates higher for more advanced therapeutic interventions.

Acute endoscopic perforations are, fortunately, a rare adverse event (**Box 1**).<sup>1-7</sup> When they do occur, however, they typically instill a great amount of fear in the endoscopist because of their potential to not only result in substantial morbidity and mortality, including sepsis and the need for surgery, but also strain the patient-physician relationship. The goal of this article is to assist in mitigating these fears by providing the endoscopist with practical measures to reduce the risk of iatrogenic foregut and colon perforations, and to discuss the appropriate means of assessing perforations when they inevitably occur.

Before every endoscopic procedure, the endoscopist should ask himself or herself, “Is this procedure truly indicated?” Though an obvious question, it should be answered from the perspective of not only the endoscopist but also the patient.

Next, it is important for the endoscopist to be prepared for the task at hand, whether that be resecting a polyp, dilating a stricture, or performing a sphincterotomy. Preparation includes several factors: (1) know the patient’s history, in addition to any underlying comorbidities and medications that increase the risk for perforation (eg, connective tissue disorder, chronic steroid use); (2) schedule the procedure for the appropriate amount of time (eg, 30 minutes may not be reasonable for endoscopic mucosal resection of a large colon adenoma); (3) have expert mastery of the endoscopic equipment and devices that will be used, including their Food and Drug Administration–approved uses, how they work, and troubleshooting them when they malfunction. It is equally important that the staff (eg, nurses, technicians) in the room also have proficiency using the equipment and devices including, but is not limited to, operation of electrosurgical generators and their different settings, the characteristics of different snares, the differences in deploying different brands of endoclips, setting up band ligators, and use of devices or equipment that may be used infrequently such as polyvinyl endoloops or mechanical lithotripters. Some suggestions for ensuring that physicians and staff remain up to date and proficient in handling endoscopic equipment include working with representatives of the various device manufacturers to arrange for regular, periodic “in-services” where hands-on demonstrations and instructions are provided in detail; encouraging staff to attend conferences or hands-on workshops geared toward GI nurses and technicians; and creating specialized nurse/technician teams to regularly staff the more advanced cases that use unique equipment (eg, endoscopic retrograde cholangiopancreatography [ERCP], endoscopic ultrasonography [EUS], luminal stenting, GI bleeding).

*Minimize Risk by Being Prepared*

- Review patient’s history and medications immediately before case
  - Identify any risk factors for perforation
- Schedule endoscopy for appropriate amount of time; do not rush

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