

ADVANCES IN GERD

Current Developments in the Management of Acid-Related GI Disorders

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Esophageal Perforations



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G&H What are the most common causes of esophageal perforations and leaks?

GSR Esophageal perforations and leaks can develop during the course of an endoscopy (eg, when removing a tumor, dilating a stricture, or inserting an endoscope) or during surgery (eg, when the surgeon's anastomosis of sutures or staples falls apart). In addition, esophageal perforations and leaks can develop in an individual experiencing multiple episodes of vomiting and retching, which puts strain on the lower portion of the esophagus, causing it to tear and rupture (ie, Boerhaave syndrome). Finally, esophageal perforations and leaks can result from ingestion of fish bones, dentures, or sharp objects.

G&H What specific factors predispose patients to developing perforations during endoscopy?

GSR There are several factors that can predispose patients to developing perforations. The experience of the endoscopist is clearly important; endoscopy should be performed only by an individual who is very well trained.

In addition, when an endoscope is entering the esophagus from the pharynx, the esophagus can rupture if the patient's spine is very stiff and the angle of entrance is very acute. This is a problem especially in older patients, whose tissue is not as elastic as that of younger, healthy patients; older patients often have stiff necks and cervical spondylosis, which increase the difficulty of inserting an endoscope into the esophagus. In these cases, endoscopists should consider using a slimmer endoscope or radiologic studies for evaluation.

Esophageal perforations can also develop when endoscopy is used to treat riskier conditions that previously required surgery. In the past, surgery was utilized to treat patients with Barrett esophagus with high-grade dysplasia or early cancer. Over the last few years, endoscopists have been managing these patients with resection or ablation of lesions, which puts patients at a higher risk for perforation. Perforations can also occur during dilation of tough esophageal strictures that develop after endoscopic management of Barrett esophagus.

It is also important to keep in mind that the general health and nutritional status of the patient may have some bearing on the development of a perforation. Patients with malnutrition and patients on radiation and/or steroid therapy may be at risk for perforation, due to weakened and thinned tissue.

G&H What signs and symptoms are associated with esophageal perforations?

GSR A perforation can be suspected based on the course of an endoscopy. For example, there should be cause for concern when an endoscopist sees blood and has difficulty moving an endoscope down the esophagus from the pharynx. The endoscopist should closely examine tissue planes during removal of tumors. Another sight that should make an endoscopist concerned about the possibility of a perforation is a deep tear in the esophagus. The patient may or may not have any immediate symptoms, but a radiograph or computed axial tomography scan can be obtained to look for the presence of air in the neck or air or fluid in the mediastinum or pleural cavity (which

would signify that the esophagus has been ruptured). A contrast radiographic study could also be performed to see if swallowed contrast or dye leaks out.

In addition, an esophageal perforation should always be suspected when a patient comes to the hospital with chest pain and vomiting episodes. A heart attack is often the first suspected cause of these symptoms, but there can also be several other life-threatening causes: pleurisy, dissection of the aorta, pulmonary embolus, and esophageal perforation.

If there is any doubt regarding the possibility of a perforation—for example, if there is a high suspicion of a perforation but a lack of confirmation from radiographs or contrast studies—the best way to prove whether a patient has a leak/perforation or whether the lining of the esophagus is intact is by performing an endoscopy. In the past, endoscopies were contraindicated in patients with possible perforations; however, it is now possible to fix perforations using an endoscope, so endoscopists are encouraged to scope patients early to determine the presence of a perforation.

G&H How are esophageal perforations usually managed?

GSR Although there are guidelines for managing peptic ulcer bleeding and esophageal variceal bleeding, the concept of having guidelines for managing esophageal perforations is relatively new. When a perforation develops, there is leakage of air and fluid from the esophagus into the chest; the leakage, not the perforation itself, is what creates a cycle of inflammation, infection, and/or sepsis. Traditionally—and up until a few years ago—if a perforation developed, surgeons would operate within the first few hours to clear all of the contamination out of the chest and pleura, and then they would fix or close the perforation if it was fresh. Sometimes, tissue inflammation was so severe that sutures would not hold the edges of the perforation together; in such cases, surgeons would leave drains in the chest to let the cavities dry up and heal on their own. This process would take a long time. In addition, patients had to undergo placement of a nasogastric tube for suction and receive nutrition intravenously or via a jejunostomy. Patients were also treated with antibiotics to control infection.

However, current management of esophageal perforations has changed. A stent is now usually placed in the esophagus to prevent fluid from leaking out into the chest. Thus, the stent bypasses and excludes the esophageal area that has ruptured. If a perforation occurs during a procedure, a stent should be inserted immediately. If stent placement is immediate and there is very little contamination of the chest, there is a high likelihood of a good

outcome. If stent placement is delayed and inflammation begins, it is likely that the outcome will not be as good. Stents are also effective for treatment of distal perforations that occur in the narrowing of the esophageal lumen.

An alternative for managing perforations is closing them with clips. Clips are often used to close small, fresh wounds; larger wounds usually require stents to bypass the area. Two types of clips are currently available. One type of clip goes through the channel of the endoscope and is used to hold together the edges of the perforation. The other type of clip is an over-the-scope clip, which acts similar to a band ligation device. This clip is placed on the end of an endoscope. When a perforation is seen, it is sucked into the cap at the end of the endoscope, and the clip is deployed onto the perforation.

Both of these tools are effective for managing perforations, but they work best for small defects and fresh wounds. If a perforation is not closed immediately, inflammation starts to set in, and a radiologist or surgeon should insert drains into the chest to clear out the contamination, which should be followed by either surgical or endoscopic closure of the perforation or diversion of esophageal contents. The infection should be controlled via antibiotics, and the nutritional needs of the patient should be addressed, if necessary.

G&H How significant of a problem is stent migration?

GSR Because most perforations develop in a normal esophagus, and there is nothing for stents to hold onto, they tend to migrate fairly often; stent migration rates of 25–40% have been reported. In patients in whom stent migration is particularly problematic, some endoscopists have tried to tie a thread around the stent, bringing the thread out of the nose to hold the stent in place.

G&H Does the presence of esophageal diseases such as gastroesophageal reflux disease affect management of esophageal perforations?

GSR Gastroesophageal reflux disease (GERD) and other esophageal diseases probably do not have an impact on the management of perforations. In general, individuals with esophageal diseases, including GERD, do not have a higher risk for perforation. However, patients with Barrett esophagus are at risk for perforation when they undergo resection. Achalasia also puts patients at a higher risk for perforation, due to the risk of rupture with balloon dilation. Therefore, every achalasia patient undergoes a barium or contrast study to check for the presence of a leak after undergoing bal-

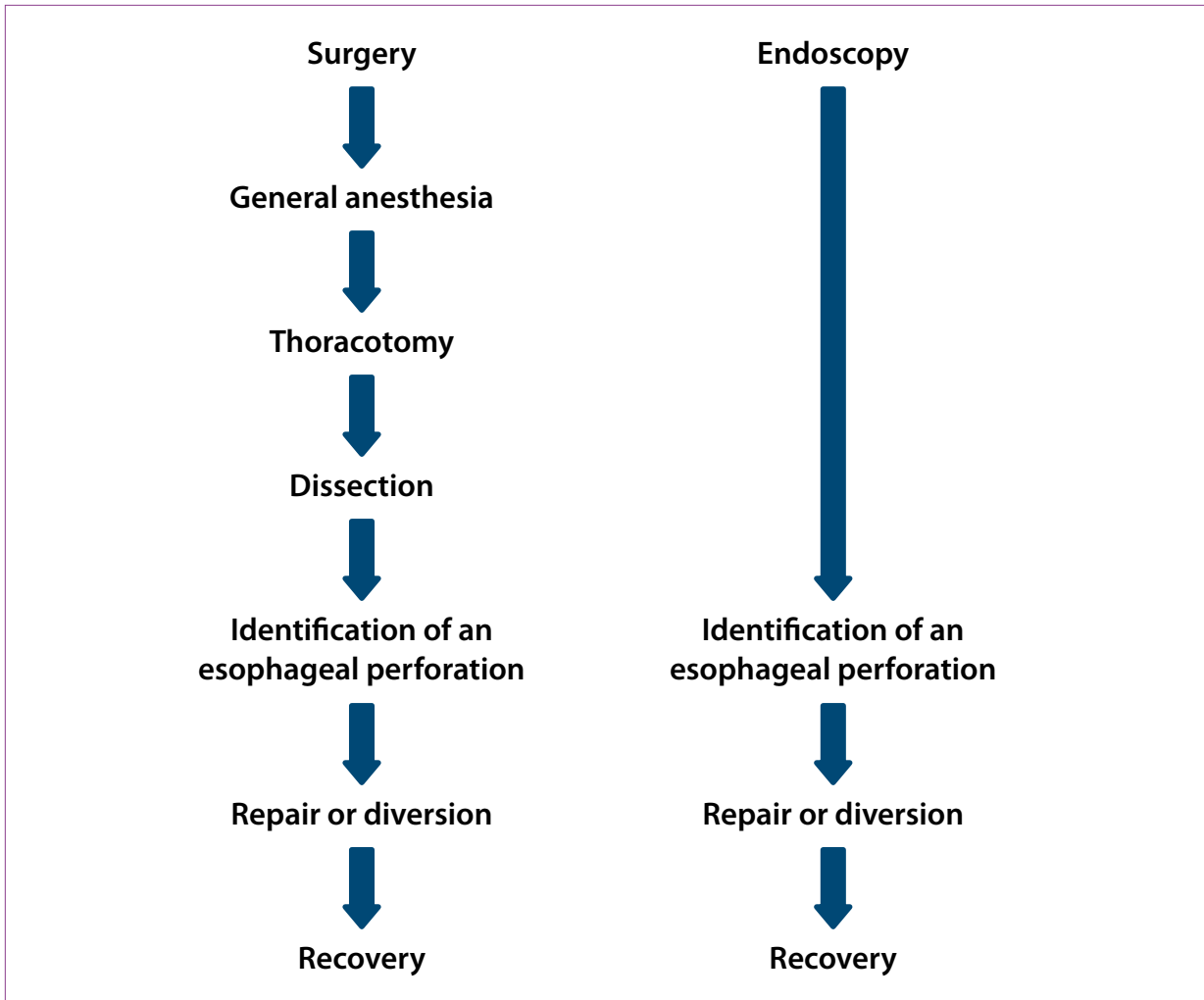


Figure 1. A comparison of surgical and endoscopic management of esophageal perforations.

loon dilation. Most of the leaks in these patients tend to be small and resolve with nonsurgical management, antibiotics, avoidance of food or drink by mouth, and a few days of hospitalization. There has been at least 1 report of using a clip to close a perforation in an achalasia patient. Patients with esophageal strictures or cancer who undergo dilation or endoscopic ultrasound for disease staging are also at risk for perforation. If these patients develop perforations, they are usually managed with immediate stent placement.

G&H Currently, besides cases of contamination, is surgery ever indicated for treatment of perforations?

GSR Management of perforations depends on the local expertise that is available. If an endoscopist has the expertise to close a perforation, and the perforation

is small, the endoscopist should do so immediately. If an endoscopist is not technically trained to perform a closure, a fresh perforation should be managed surgically. As previously discussed, surgery is required if there is contamination of the chest, such as mediastinitis or pleural effusions.

As also discussed, management of esophageal perforations is moving from a traditional, well-accepted treatment (surgery) to a minimally invasive approach (endoscopy) that causes less patient trauma and involves a team comprised of an endoscopist, surgeon, interventional radiologist, and intensive care physician (Figure 1). Surgery involves cracking open the chest and dissecting to find a very small hole that needs only a few stitches. Patients who undergo surgical management of perforations have longer recovery times than patients who are treated endoscopically. In addition, patients usually have to wait for a surgeon, anesthesiologist, and

operating room to become available. During this waiting period, fluid is continuing to leak out, and inflammation is setting in. All of these consequences can be avoided if the perforation is detected and immediately managed during endoscopy.

G&H What medical therapies can be used for managing these patients?

GSR These patients are usually placed on intravenous proton pump inhibitor therapy to reduce secretions from the esophagus or stomach. In addition, the head of the patient's bed is usually raised to prevent gastric reflux. Patients are also given broad-spectrum antibiotics to control infection.

G&H Do perforations usually cause lasting damage to the esophagus? Are these patients more likely to develop other esophageal problems?

GSR We do not know the answers to these questions. A few patients who have been followed have not complained of any esophageal symptoms. However, if they have an underlying problem, that problem will have its own issues.

G&H Are there any prophylactic measures that can be used to reduce the risk of perforation?

GSR Good endoscopic technique can reduce the risk of perforation; this includes knowing to back off when things are not going well and knowing when to ask for help. It is also important to immediately act on any suspicions

of perforations. As previously mentioned, esophageal perforation should be considered and ruled out as soon as possible in any patient presenting to the emergency room with chest pain and vomiting, once heart and lung diseases are excluded. It is often forgotten that perforation may be a cause of these symptoms—perforations may continue to leak and patients may become sicker while doctors are trying to determine what is happening. Appropriate training for placement of stents and clips is also important. Endoscopists can learn the art of clip placement and stent insertion by attending formal advanced endoscopy programs or hands-on training courses held by the American Society of Gastrointestinal Endoscopy.

For more information about Dr. Raju, please visit http://faculty.mdanderson.org/Gottumukkala_Raju or <https://www.facebook.com/Gottumukkala.Subba.Raju>.

Suggested Reading

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