

# ADVANCES IN GERD

Current Developments in the Management of Acid-Related GI Disorders

Section Editor: Joel E. Richter, MD

## Antireflux Surgery in Lung Transplant Patients



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### G&H What surgical options are currently available for the treatment of gastroesophageal reflux disease?

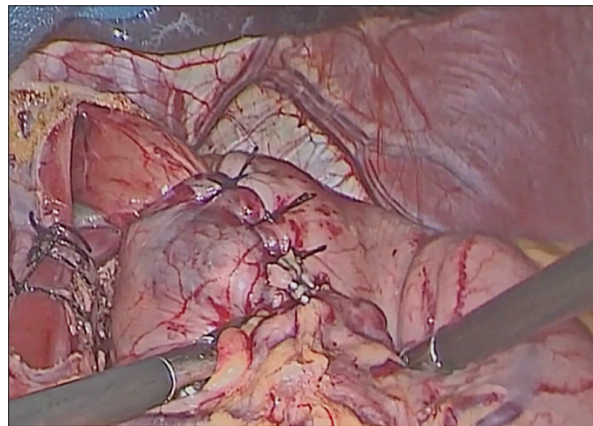
**MP** There are 3 options currently available to treat gastroesophageal reflux disease (GERD) by restoring the competence of the lower esophageal sphincter. The first is a magnetic ring, which is placed laparoscopically around the gastroesophageal junction while the patient is under general anesthesia. This procedure has strict inclusion criteria; in order to undergo magnetic ring placement, the patient must either have a very small or no hernia and normal esophageal motility.

The second option is endoscopic fundoplication, which also has strict inclusion criteria. This procedure creates a fundoplication endoscopically by placing T-fasteners between the fundus of the stomach and the esophagus and is effective in approximately 60% of patients.

The third option is laparoscopic fundoplication, which involves reducing the hiatal hernia, approximating the right and left pillars of the diaphragmatic crus, and wrapping the fundus of the stomach over the gastroesophageal junction. Laparoscopic fundoplication is considered safe and effective at controlling reflux (Figure 1).

### G&H How prevalent is GERD among lung transplant patients?

**MP** Approximately 50% to 70% of lung transplant patients have GERD. The percentage typically increases after a lung transplant, perhaps due to damage to the vagal nerves, delay in gastric emptying, or because of medications. Some patients can be asymptomatic and have silent

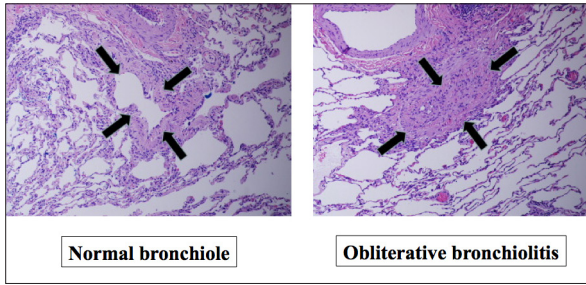


**Figure 1.** An intraoperative image of a completed laparoscopic fundoplication.

reflux. GERD is thought to cause aspiration, which may eventually contribute to rejection; this is known as bronchiolitis obliterans syndrome (Figure 2).

### G&H How are patterns of GERD identified in patients with lung disease?

**MP** Symptoms alone are often unreliable for a diagnosis of GERD because of low sensitivity and specificity. This is particularly true in patients with lung disease, as many patients can be asymptomatic and have silent reflux. Endoscopy is often useless as a method of establishing a diagnosis because approximately 60% of patients with GERD do not have esophagitis. Therefore, patients should be screened with esophageal manometry and ambulatory pH monitoring irrespective of the presence of symptoms.



**Figure 2.** A comparison of normal-appearing bronchiole to obliterative bronchiolitis (100× magnification, hematoxylin and eosin stain).

### G&H What is the relationship between lung transplantation, bronchiolitis obliterans syndrome, and GERD?

**MP** Bronchiolitis obliterans syndrome, a chronic rejection in which fibrosis forms in the transplanted lungs, plays a significant role in the rate of survival in lung transplant patients. Whereas the 5-year survival rates of kidney and liver transplants are each approximately 90%, the 5-year survival rate of lung transplants is approximately 50%. The bronchiolitis obliterans syndrome is likely multifactorial in origin, but GERD is thought to play an important role.

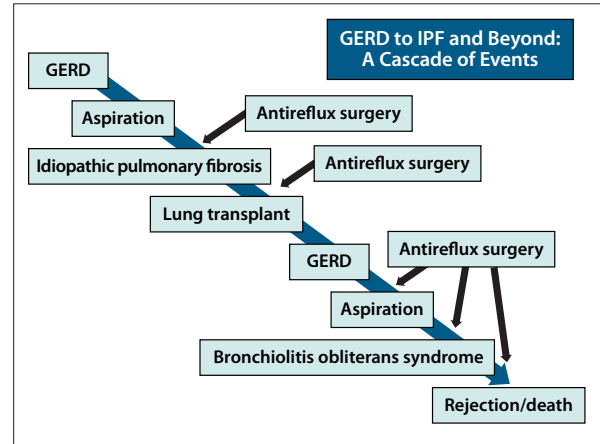
Many studies have shown that antireflux surgery, if performed early after the lung transplant, significantly improves the survival rate of lung transplantation similar to that of kidney or liver transplantation.

### G&H Is there a certain time frame posttransplant in which antireflux surgery should be performed?

**MP** Evidence suggests that the sooner antireflux surgery is performed after lung transplantation, the better. After lung transplant, the patient should be evaluated for GERD via manometry, pH monitoring, and bronchoscopy (to search for pepsin or bile acids in the bronchoalveolar lavage fluid). If these tests show that GERD and aspiration are occurring, the patient should undergo antireflux surgery to avoid the development of bronchiolitis obliterans syndrome (Figure 3).

### G&H What role does antireflux surgery play in lung transplant patients with respect to GERD symptoms and proton pump inhibitor use?

**MP** Proton pump inhibitors do not block reflux, but merely change the acidity of the gastric contents. Contents, even if weakly acidic or alkaline, will continue to reflux into the esophagus because of the incompetent lower esophageal sphincter, and aspiration will occur. On



**Figure 3.** An algorithm for the treatment of GERD via antireflux surgery in lung transplant patients.

GERD, gastroesophageal reflux disease; IPF, idiopathic pulmonary fibrosis.

the other hand, a fundoplication will restore the competence of the lower esophageal sphincter and prevent any type of reflux.

### G&H Is antireflux surgery effective in preventing rejection in lung transplant recipients?

**MP** Yes, it is. Studies from Duke University, Toronto General Hospital, and Brigham Young University have shown that fundoplication performed soon after lung transplantation decreases the incidence of bronchiolitis obliterans syndrome and increases the survival of the patient.

### G&H How safe is antireflux surgery in patients who have undergone lung transplant?

**MP** If the surgery is performed early after lung transplantation, while the lung function is optimal and there are no signs of rejection, antireflux surgery is a very safe and effective procedure. It should be noted that this operation should be performed by a team of experienced lung transplant anesthesiologists and by surgeons who are capable of performing the surgery quickly and safely.

### G&H Are there any risks involved with antireflux surgery?

**MP** Yes. Some of the risks are common to all operations independent of the lung transplant, such as infection, bleeding, and need for a laparotomy. Other risks are related to the condition of the patient at the time of the operation; for instance, if the patient has had multiple episodes of rejection, fibrosis, or pulmonary hypertension, the possibility of complications is higher. If the patient is

doing well, the operation has very low risks. Therefore, the best approach is to document after the lung transplant if the patient has GERD and to perform the fundoplication soon thereafter.

### **G&H** Are there any patients in whom antireflux surgery should not be performed?

**MP** Antireflux surgery should be avoided in patients whose lung function has deteriorated to the point that they would not receive any benefits from undergoing surgery. If a patient has severe fibrosis or pulmonary hypertension, his or her best option is to undergo another lung transplant.

### **G&H** When should a partial rather than total fundoplication be performed?

**MP** Partial fundoplication is ideal in patients with scleroderma and end-stage lung disease because often these patients have no esophageal peristalsis. A total fundoplication would prevent GERD but create too much of a resistance at the level of the gastroesophageal junction with consequent severe dysphagia. Sometimes, dysphagia can be present even after a partial fundoplication.

### **G&H** How should patients be followed up after antireflux surgery is performed?

**MP** After a fundoplication, patients should be screened for GERD to evaluate whether the reflux has been controlled, even if they are asymptomatic.

### **G&H** What future research is needed?

**MP** There is important research currently taking place regarding idiopathic pulmonary fibrosis. The National Institutes of Health is funding a phase 2, multicenter, randomized trial in which patients with idiopathic pulmonary fibrosis and GERD are randomized to receive either no treatment or a fundoplication. The study is assessing whether the natural history of idiopathic pulmonary fibrosis can be altered by stopping reflux. This could eventually avoid the need for a lung transplant.

*Dr Patti has no relevant conflicts of interest to disclose.*

### **Suggested Reading**

Abbassi-Ghadi N, Kumar S, Cheung B, et al. Anti-reflux surgery for lung transplant recipients in the presence of impedance-detected duodenogastroesophageal reflux and bronchitis obliterans syndrome: a study of efficacy and safety. *J Heart Lung Transplant.* 2013;32(6):588-595.

Gaspar WJ, Sweet MP, Hoopes C, et al. Antireflux surgery for patients with end-stage lung disease before and after lung transplantation. *Surg Endosc.* 2008;22(2):495-500.

Hoppo T, Jarido V, Pennathur A, et al. Antireflux surgery preserves lung function in patients with gastroesophageal reflux disease and end-stage lung disease before and after lung transplantation. *Arch Surg.* 2011;146(9):1041-1047.

Patti MG, Gaspar WJ, Fisichella PM, Nipomnick I, Palazzo F. Gastroesophageal reflux disease and connective tissue disorders: pathophysiology and implications for treatment. *J Gastrointest Surg.* 2008;12(11):1900-1906.

Pegna V, Mickevicius A, Tsang C. How useful is antireflux surgery in lung transplant patients with gastroesophageal reflux? *Medicina (Kaunas).* 2014;50(6):318-322.

Robertson AG, Krishnan A, Ward C, et al. Anti-reflux surgery in lung transplant recipients: outcomes and effects on quality of life. *Eur Respir J.* 2012;39(3):691-697.

Sweet MP, Patti MG, Hoopes C, Hays SR, Golden JA. Gastro-oesophageal reflux and aspiration in patients with advanced lung disease. *Thorax.* 2009;64(2):167-173.