



# Complications of gastroesophageal reflux in adults

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## INTRODUCTION

Gastroesophageal reflux disease (GERD) may result in esophageal or extraesophageal complications. These complications may result from direct inflammation due to the refluxate or as a consequence of the reparative process (eg, peptic stricture and Barrett's metaplasia). This topic will review the complications of GERD. The pathophysiology, clinical manifestations, diagnosis, and management of GERD are discussed separately. (See "[Clinical manifestations and diagnosis of gastroesophageal reflux in adults](#)".)

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## ESOPHAGEAL COMPLICATIONS

**Erosive esophagitis** — Erosive esophagitis occurs when excessive reflux of acid and pepsin results in necrosis of surface layers of esophageal mucosa, causing erosions and ulcers. Patients with erosive esophagitis can be asymptomatic or present with heartburn, regurgitation, dysphagia, and odynophagia [1]. The diagnosis and management of erosive esophagitis are discussed separately. (See "[Clinical manifestations and diagnosis of gastroesophageal reflux in adults](#)", section on 'Endoscopic findings' and "[Medical management of gastroesophageal reflux disease in adults](#)", section on 'Severe or frequent symptoms or erosive esophagitis'.)

**Barrett's esophagus** — Barrett's esophagus is a condition in which metaplastic columnar epithelium replaces the stratified squamous epithelium that normally lines the distal

esophagus. The metaplastic epithelium is acquired as a consequence of chronic gastroesophageal reflux disease (GERD) and predisposes to the development of esophageal cancer. The specialized intestinal columnar metaplasia typical of Barrett's esophagus causes no symptoms. Most patients are seen initially for symptoms of associated GERD, such as heartburn, regurgitation, and dysphagia. GERD associated with long-segment Barrett's esophagus is frequently complicated by esophageal ulceration, stricture, and hemorrhage. (See ["Barrett's esophagus: Epidemiology, clinical manifestations, and diagnosis"](#), section on 'Clinical features'.)

**Esophageal stricture** — Peptic strictures are a result of the healing process of ulcerative esophagitis. Collagen is deposited during this phase and, with time, the collagen fibers contract, narrowing the esophageal lumen. These strictures are usually short in length and contiguous with the gastroesophageal junction; endoscopy may also reveal adjacent areas of reflux esophagitis ( [picture 1](#) and [image 1](#)). Patients may have solid food dysphagia and episodic food impaction. The management of benign esophageal strictures involves dilation combined with acid-suppressive therapy with a proton pump inhibitor to prevent the recurrence of strictures once they have been adequately dilated [2-5]. (See ["Endoscopic interventions for nonmalignant esophageal strictures in adults"](#) and ["Medical management of gastroesophageal reflux disease in adults"](#).)

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## EXTRAESOPHAGEAL COMPLICATIONS

Regurgitation and/or aspiration of gastric juice have been associated with several extraesophageal complications. However, the role of gastroesophageal reflux disease (GERD) in the pathogenesis of these disorders is often overestimated.

**Asthma** — GERD is common in patients with asthma and has been identified as a potential trigger for asthma [6]. Approximately 34 to 89 percent of asthmatics have GERD, and up to 40 percent of asthmatics have peptic esophagitis [7,8]. Three potential mechanisms have been proposed whereby esophageal acid may produce bronchoconstriction and therefore exacerbate airflow obstruction in asthmatics: increased vagal tone, heightened bronchial reactivity, and microaspiration of gastric contents into the upper airway. The association between reflux and asthma, as well as the management of GERD in patients with asthma, are discussed separately. (See ["Gastroesophageal reflux and asthma"](#).)

**Otolaryngologic complications** — Otolaryngologic complications of GERD can result from laryngopharyngeal reflux (LPR) in which the reflux of gastric contents results in contact injury to

the pharyngeal and laryngeal mucosa [9-12]. (See "[Laryngopharyngeal reflux in adults: Evaluation, diagnosis, and management](#)".)

**Chronic laryngitis** — Patients with laryngitis present with a change in voice quality or hoarseness due to LPR. Other symptoms associated with LPR include throat clearing, persistent cough, globus sensation (sensation of a lump or foreign body in the throat), laryngospasm, or choking sensation [13]. The diagnosis and management of laryngitis and LPR are discussed separately. (See "[Laryngopharyngeal reflux in adults: Evaluation, diagnosis, and management](#)" and "[Globus sensation](#)".)

**Laryngeal and tracheal stenosis** — LPR can result in laryngeal and tracheal stenosis. Presenting symptoms in patients with central airway obstruction are nonspecific and can be subacute or acute. The clinical manifestations typically depend upon the degree of luminal obstruction, as well as the location and length of time that obstruction has been present. Symptoms include dyspnea, cough, hemoptysis, and wheezing. (See "[Clinical presentation, diagnostic evaluation, and management of malignant central airway obstruction in adults](#)", section on 'Etiology and pathophysiology'.)

LPR may also play an important role in the development of subglottic stenosis in patients intubated for prolonged periods [14]. The vocal process of the arytenoids and the posterior cricoid are the sites most often injured by intubation. Following initial disruption of the mucosa, periodic exposures of the exposed cartilage to gastric secretions results in inflammation and a hyperplastic reparative process [10,15].

**Other complications** — Other chronic complications of GERD include chronic cough, dental erosions, chronic sinusitis, and recurrent pneumonitis [16-19]. (See "[Causes and epidemiology of subacute and chronic cough in adults](#)" and "[Chronic rhinosinusitis: Clinical manifestations, pathophysiology, and diagnosis](#)" and "[Cryptogenic organizing pneumonia](#)".)

GERD is associated with an increased risk of esophageal adenocarcinoma [20]. Some studies have suggested that gastric reflux is associated with an increased risk of laryngopharyngeal and lung cancer, however, it is unclear if GERD is causal [21-26]. A small increase in mortality from esophageal adenocarcinoma was demonstrated in a population-based cohort study of 56,139 individuals of whom 4758 had severe reflux symptoms [27]. In this study, severe reflux was associated with an increased risk of esophageal adenocarcinoma-specific mortality in men but mortality rates from esophageal adenocarcinoma were low (HR men 6.1, 95% CI 2.3 to 15.9, mortality rate men 0.27 per 1000 person-years). Severe reflux was not associated with an increased all-cause mortality, overall cancer-specific mortality, or mortality in cancer of the

head-and-neck or lung. (See "[Barrett's esophagus: Surveillance and management](#)", section on '[Cancer risk](#)'.)

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## SOCIETY GUIDELINE LINKS

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "[Society guideline links: Gastroesophageal reflux in adults](#)".)

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## INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5<sup>th</sup> to 6<sup>th</sup> grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10<sup>th</sup> to 12<sup>th</sup> grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topics (see "[Patient education: Acid reflux and GERD in adults \(The Basics\)](#)" and "[Patient education: Esophageal stricture \(The Basics\)](#)")
  - Beyond the Basics topics (see "[Patient education: Gastroesophageal reflux disease in adults \(Beyond the Basics\)](#)")
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## SUMMARY AND RECOMMENDATIONS

- Gastroesophageal reflux disease (GERD) may result in esophageal or extraesophageal complications. These complications may result from direct inflammation due to the refluxate or as a consequence of the reparative process (eg, peptic stricture and Barrett's metaplasia). (See '[Introduction](#)' above.)

- Erosive esophagitis occurs when excessive reflux of acid and pepsin results in necrosis of surface layers of esophageal mucosa, causing erosions and ulcers. Patients with erosive esophagitis can be asymptomatic or present with heartburn, regurgitation, dysphagia, and odynophagia. (See '[Erosive esophagitis](#)' above.)
- Barrett's esophagus is the condition in which metaplastic columnar epithelium replaces the stratified squamous epithelium that normally lines the distal esophagus. The metaplastic epithelium is acquired as a consequence of chronic GERD and predisposes to the development of esophageal cancer. (See '[Barrett's esophagus](#)' above.)
- Peptic strictures are a result of the healing process of ulcerative esophagitis. Patients may have solid food dysphagia and episodic food impaction. The management usually involves dilation combined with acid-suppressive therapy with a proton pump inhibitor to prevent the recurrence of strictures once they have been adequately dilated. (See '[Esophageal stricture](#)' above.)
- GERD is common in patients with asthma and has been identified as a potential trigger for asthma. Reflux-induced asthma may result from increased vagal tone, heightened bronchial reactivity, and microaspiration of gastric contents into the upper airway. (See '[Asthma](#)' above.)
- Otolaryngologic complications can result from the laryngopharyngeal reflux (LPR) of gastric contents with subsequent contact injury of the pharyngeal and laryngeal mucosa. Patients with chronic laryngitis present with a change in voice quality or hoarseness due to LPR. Other symptoms associated with LPR include throat clearing, persistent cough, globus sensation (lump in the throat feeling), laryngospasm, or choking sensation. (See '[Chronic laryngitis](#)' above.)
- LPR can result in laryngeal and tracheal stenosis. Presenting symptoms are nonspecific and can be subacute or acute. The clinical manifestations typically depend upon the degree of luminal obstruction, as well as the location and length of time that obstruction has been present. Symptoms include dyspnea, cough, hemoptysis, and wheeze. (See '[Laryngeal and tracheal stenosis](#)' above.)
- Other chronic complications of GERD include chronic cough, dental erosions, chronic sinusitis, recurrent pneumonitis. (See '[Other complications](#)' above.)

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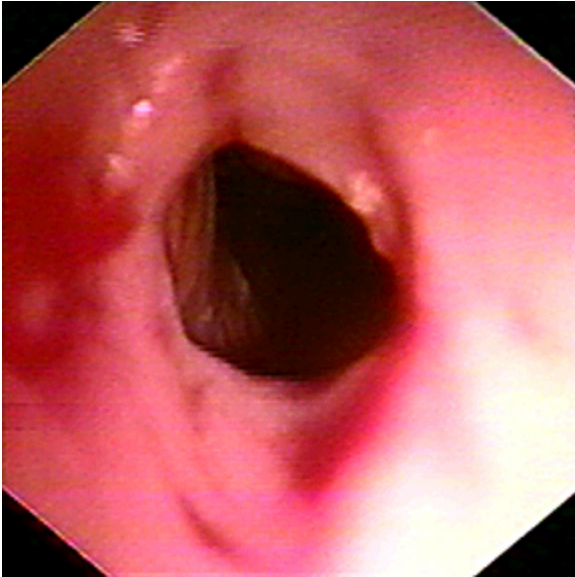
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## GRAPHICS

### Peptic esophageal stricture



Endoscopy shows a peptic esophageal stricture with adjacent areas of inflammation and ulceration due to reflux-induced injury.

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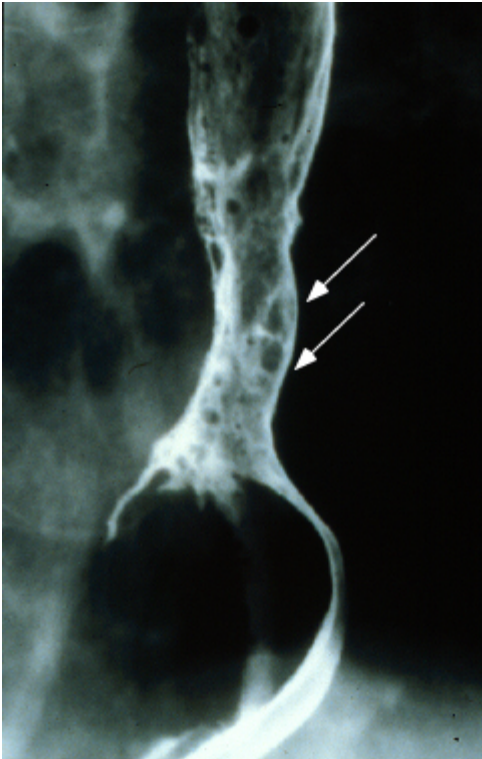
*Courtesy of James B McGee, MD.*

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Graphic 51348 Version 1.0



## Peptic esophageal stricture



Esophagram demonstrates 6 cm long distal esophageal peptic stricture with associated nodularity (arrows). Note the granular pattern of the esophagus consistent with esophagitis.

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*Courtesy of Anita E Spiess, MD and Peter J Kahrilas, MD.*

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Graphic 73360 Version 2.0

## Contributor Disclosures

**Peter J Kahrilas, MD** Patent Holder: Medtronic [FLIP panometry methods and technology]. Consultant/Advisory Boards: Ironwood [Irritable bowel]; Johnson & Johnson [Anti-reflux surgery]; Reckitt [Reflux disease]. Speaker's Bureau: Phathom [Reflux disease, H. pylori]. All of the relevant financial relationships listed have been mitigated. **Nicholas J Talley, MD, PhD** Patent Holder: Australian Provisional Patent [Diagnostic marker for functional gastrointestinal disorders]; Biomarkers of irritable bowel syndrome [Irritable bowel syndrome]; Mayo Clinic [Dysphagia questionnaire]; Mayo Clinic [Bowel Disease questionnaire]; Nepean Dyspepsia Index [Dyspepsia]; Nestec [Irritable bowel syndrome]; Singapore Provisional Patent [BDNF Tissue Repair Pathway]. Grant/Research/Clinical Trial Support: Alimetry [Gastric mapping device research collaboration]; Allakos [Gastric eosinophilic disease]; AstraZeneca [Eosinophilic gastritis, eosinophilic gastroenteritis]; Intrinsic Medicine [Bowel syndrome with constipation]; NHMRC Centre for Research Excellence in Digestive Health [NHMRC Investigator grant]. Consultant/Advisory Boards: Adelphi Values [Functional dyspepsia]; Allakos [Gastric eosinophilic disease, AK002]; AstraZeneca [Eosinophilic gastritis, eosinophilic gastroenteritis]; AusEE [Eosinophilic gut diseases]; Bayer [Inflammatory bowel syndrome]; BluMaiden [Microbiome Ad Board]; Comvita Mānuka Honey [Digestive health]; Dr Falk Pharma [Eosinophilia]; GlaxoSmithKline Australia [Educational speaker eosinophilic gut disease]; Glutagen [Celiac disease]; International Foundation for Functional Gastrointestinal Disorders [Advisory board, functional GI disorders]; Intrinsic Medicine [Human milk oligosaccharide]; IsoThrive [Esophageal microbiome]; Planet Innovation [Gas capsule, inflammatory bowel syndrome]; Progenity Inc [Intestinal capsule]; Rose Pharma [IBS]; Viscera Labs [Inflammatory bowel syndrome, diarrhea]. Other Financial Interest: Elsevier textbook royalties [Medical education]. All of the relevant financial relationships listed have been mitigated. **Shilpa Grover, MD, MPH, AGAF** No relevant financial relationship(s) with ineligible companies to disclose.

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