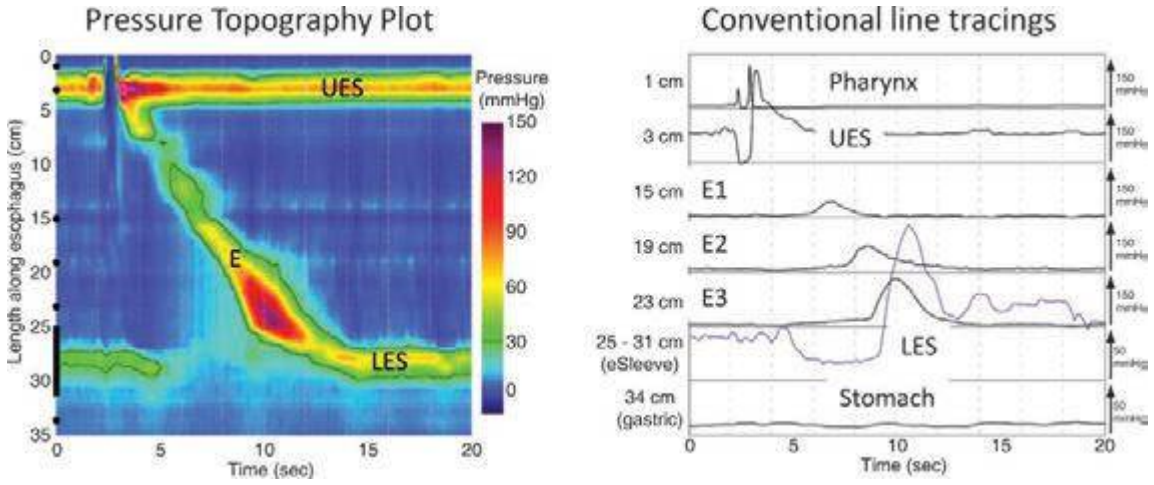

FIGURE 347-1 **High-resolution esophageal pressure topography (*right*) and conventional manometry (*left*) of a normal swallow.** E, esophageal body; LES, lower esophageal sphincter; UES, upper esophageal sphincter.

testing can demonstrate excessive esophageal exposure to refluxed gastric juice, the physiologic abnormality of GERD. This can be done by ambulatory 24- to 48-h esophageal pH recording using either a wireless pH-sensitive transmitter that is anchored to the esophageal mucosa or a transnasally positioned wire electrode with the tip stationed in the distal esophagus. Either way, the outcome is expressed as the percentage of the day that the pH was less than 4 (indicative of recent acid reflux), with values exceeding 5% indicative of GERD. Reflux testing is useful with atypical symptoms or an inexplicably poor response to therapy. Intraluminal impedance monitoring can be added to pH monitoring to detect reflux events irrespective of whether or not they are acidic, potentially increasing the sensitivity of the study.

STRUCTURAL DISORDERS

HIATAL HERNIA

Hiatus hernia is a herniation of viscera, most commonly the stomach, into the mediastinum through the esophageal hiatus of the diaphragm. Four types of hiatus hernia are distinguished with type I, or sliding hiatal hernia, comprising at least 95% of the overall total. A sliding hiatal hernia is one in which the gastroesophageal junction and gastric cardia translocate cephalad as a result of weakening of the phrenoesophageal ligament attaching the gastroesophageal junction to the diaphragm at the hiatus and dilatation of the diaphragmatic hiatus. The incidence of sliding hernia increases with age. True to its name, sliding hernias enlarge with increased intraabdominal pressure, swallowing, and respiration. Conceptually, sliding hernias are the result of wear and tear: increased intraabdominal pressure from abdominal obesity, pregnancy, etc., along with hereditary factors predisposing to the condition. The main significance of sliding hernias is the propensity of affected individuals to have GERD.

Types II, III, and IV hiatal hernias are all subtypes of paraesophageal hernia in which the herniation into the mediastinum includes a visceral structure other than the gastric cardia. With type II and III paraesophageal hernias, the gastric fundus also herniates with the distinction being that in type II, the gastroesophageal junction remains fixed at the hiatus, whereas type III is a combined sliding and paraesophageal hernia. With type IV hiatal hernias, viscera other than the stomach herniate into the mediastinum, most commonly the colon. With type II and III paraesophageal hernias, the stomach inverts as it herniates and large paraesophageal hernias can lead to an upside down stomach, gastric volvulus, and even strangulation of the stomach. Because of this risk, surgical repair is often advocated for large paraesophageal hernias.

RINGS AND WEBS

A lower esophageal mucosal ring, also called a *B ring*, is a thin membranous narrowing at the squamocolumnar mucosal junction (Fig. 347-2). Its origin is unknown, but B rings are demonstrable in about 10–15% of the general population and are usually asymptomatic. When the lumen diameter is less than 13 mm, distal rings are usually associated with episodic solid food dysphagia and are called *Schatzki rings*. Patients typically present older than 40 years, consistent with an acquired rather than congenital origin. Schatzki ring is one of the most common causes of intermittent food impaction, also known as "steakhouse syndrome" because meat is a typical instigator. Symptomatic rings are easily treated by dilation.

Web-like constrictions higher in the esophagus can be of congenital or inflammatory origin. Asymptomatic cervical esophageal webs are demonstrated in about 10% of people and typically originate along the anterior aspect of the esophagus. When circumferential, they can

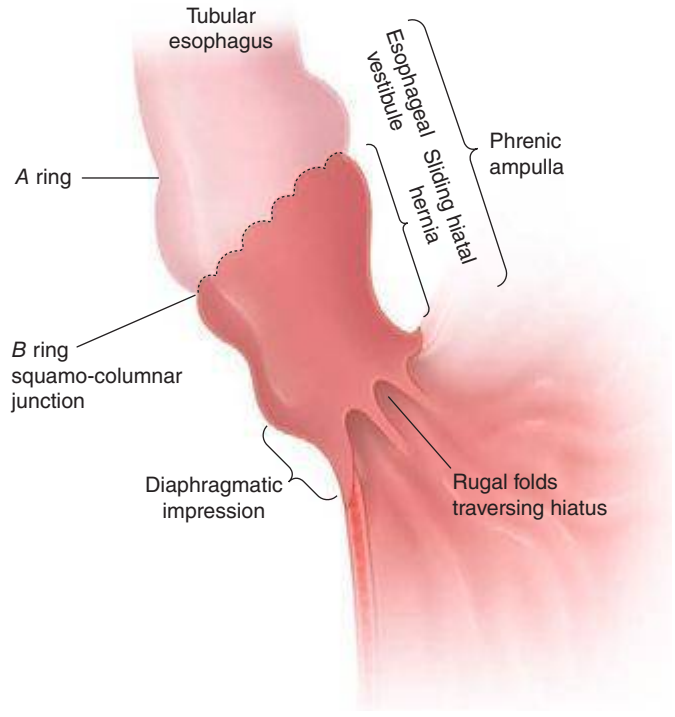

FIGURE 347-2 **Radiographic anatomy of the gastroesophageal junction.**