Patients with esophageal diverticula may present with a variety of symptoms. Many of these symptoms mimic less serious disease, making diagnosis of esophageal diverticulum difficult for many primary care physicians. Delayed or missed diagnosis of this disorder may lead to more serious problems including gastrointestinal bleeding, aspiration pneumonia, and cancer. Our case series illustrates a variety of symptoms observed among three patients who were diagnosed and surgically treated for esophageal diverticulum. Appropriate diagnosis and management of esophageal diverticulum results in resolution of symptoms and decreased risk of morbidity.

Esophageal diverticulum is an out-pouching or sac of the epithelial-lined tissue of the esophagus. It may be a true diverticulum, involving all layers of the esophagus, or a false diverticulum, involving only the mucosa and submucosal layers that protrude into the circular and longitudinal muscle of the esophagus.1

Diverticulum are generally categorized by esophageal location: upper (pharyngoesophageal or Zenker), middle, or lower (epiphrenic).1 Further categorization relates to presumed etiology, namely traction vs pulsion. For example, midesophageal diverticula are believed to result from traction as a consequence of long-standing mediastinal inflammation or fibrosis—as in tuberculosis or histoplasmosis.1 Pharyngoesophageal and epiphrenic diverticula usually result from an esophageal motility disorder leading to repeated increased pressure in the area of the diverticulum. Epiphrenic diverticula typically occur within 10 cm of the esophagogastic junction.2

Failure to diagnose an epiphrenic esophageal diverticulum may lead to a plague of symptoms—or serious problems such as gastrointestinal bleeding, aspiration pneumonia, or cancer.3 Unfortunately, many early symptoms of epiphrenic esophageal diverticulum mimic other more common conditions (eg, gastroesophageal reflux disease, gastroparesis, eosinophilic esophagitis, adverse effects of chronic use of nonsteroidal anti-inflammatory drugs) and are often mistakenly viewed by clinicians as being time-limited or chronic but stable, leading to delay in diagnosis.

We present a case series of three patients who, together, illustrate the wide spectrum of symptoms and problems caused by esophageal diverticulum.

Case Series
We conducted a retrospective review of all patient medical records from the Division of Thoracic Surgery at Geisinger Wyoming Valley Medical Center (Wilkes-Barre, Pennsylvania) for cases where epiphrenic diverticulum was clinically managed by house staff from July 2004 through December 2004. Records for three patients met these inclusion criteria.

Patient medical history, results of radiologic evaluations, operative notes, and documentation of follow-up visits were used to gain information about subject symptoms and treatment course.

Patient 1: Gastrointestinal Bleeding, Cancer
An 80-year-old man had a medical history of sporadic upper gastrointestinal bleeding dating back more than 25 years. In 1978, results from an esophagogastroduodenoscopy (EGD) were normal and bleeding was attributed to duodenal ulcer. A second EGD 20 years later, in 1998, led clinicians to identify a nonbleeding epiphrenic esophageal diverticulum. In 2004, the patient had melena.

At the time of this third EGD, which occurred during the timeframe specified for our retrospective investigation, a visible bleeding vessel in the diverticulum was cauterized. Biopsy of a separate patch of flat white mucosa revealed squamous cell carcinoma. Fluoroscopic imaging with liquid barium sulfate suspension (Figure 1) and a computed tomography colonography showed only the large diverticulum.

The patient underwent diverticulectomy via right thoracotomy. Recovery was uncomplicated. Pathology reports showed superficial carcinoma, other areas of dysplasia, and negative nodes.

The patient is presently asymptomatic with no recurrent cancer at 60 months.
Patient 2: Regurgitation, Pain, Dysphagia, Odynophagia
A 75-year-old woman reported pain in her lower chest and upper abdomen accompanied by a bitter-tasting fluid in her mouth when she bent over. In addition, she reported that food seemed to stick in her chest when she swallowed and she would awake at night coughing.

One year previous, the patient reported heartburn. Results from an esophagram revealed an epiphrenic diverticulum. No intervention was undertaken at that time.

During the timeframe specified for the present investigation, an EGD showed a 6-cm epiphrenic diverticulum that was confirmed on esophagram (Figure 2). The patient underwent diverticulectomy via limited left thoracotomy.

She is presently asymptomatic.

Patient 3: Heartburn, Dysphagia, Aspiration Pneumonia
A 76-year-old woman complained of a 10-year history of heartburn and regurgitation. At times, she reported, food would “stick in [her] chest” when she swallowed. She also experienced a metallic taste in her mouth in the morning. She had many hospital admissions for recurrent pneumonia.

Esophagram (Figure 3) showed two epiphrenic esophageal diverticula, 6 cm and 2 cm, respectively. Manometry showed preserved motility and a lower esophageal sphincter pressure of 15 mm Hg.

The patient underwent diverticulectomy via limited left thoracotomy.

Laparotomy for small bowel obstruction was required 14 months later—at which time results from esophagram and EGD revealed unremarkable esophagus.

She currently remains asymptomatic.

Discussion
The wide spectrum of symptoms caused by epiphrenic esophageal diverticula—all of which mimic those caused by more common conditions and most of which are illustrated by the three subjects in our retrospective case series—makes clinical diagnosis of this esophageal motility disorder difficult.

Diverticula may cause anorexia, chest pain, dysphagia, epigastric pain, halitosis, hematemesis, heartburn, melena, nocturnal cough, odynophagia, regurgitation, or weight loss. However, in as many as 40% of patients, the diverticulum will be nonsymptomatic.

Esophagrams are diagnostic and helpful to the surgeon. Esophagogastroduodenoscopy is recommended for the detection of other pathology (eg, ulcer, dysplasia, cancer). Although physicians at our institution have used it selectively in the present series of cases, esophageal manometry is a reasonable diagnostic tool used in the evaluation of associated motility disorder.

A delay in the diagnosis and treatment of epiphrenic diverticula can lead to severe complications. Patients are at risk of regurgitation, gastrointestinal bleeding, and aspiration pneumonia.

Patients with undiagnosed epiphrenic diverticulum may also be at increased risk for cancer, which occurs at a frequency of 0.3% to 3% for patients with this condition. Unfortunately, in cases of epiphrenic diverticula carcinoma, the cancer is often advanced at the time of diagnosis.
Esophageal myotomy distal to the neck of the diverticulum may be added in all patients—or selectively for those identified by manometry to require it. Surgeons who approach the diverticulum laparoscopically often add fundoplication due to the obligatory disruption of the hiatus with this technique.

Conclusion
Our case series illustrates the breadth of symptoms and potential consequences of epiphrenic diverticula of the esophagus, the frequent delay in diagnosis and surgical referral, and the good results often obtained through surgical treatment.

It is important for the practicing primary care physician to consider the diagnosis of epiphrenic diverticula in patients with anorexia, chest pain, dysphagia, epigastric pain, halitosis, hematemesis, heartburn, melena, nocturnal cough, odynophagia, regurgitation, or weight loss. Often these symptoms are attributed too quickly to less serious pathology, leading to delay in diagnosis of epiphrenic esophageal diverticula. Delayed diagnosis can result in more severe and potentially life-threatening conditions such as aspiration pneumonia and cancer.

Radiographic testing with liquid barium sulfate suspension is generally a safe, simple, and effective diagnostic method.

References