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EDUCATION PRACTICE

A 78-Year-Old Man With Difficulty Swallowing

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Clinical Scenario

A 78-year-old man presents with dysphagia. His symptoms began several years ago with progression during the past year. He has particular problems swallowing pills, dry food, and meat, but he denies food impaction. His dysphagia localizes to the suprasternal notch, without associated odynophagia, nasal regurgitation, cough, hoarseness, or weight loss. He has a history of heartburn that has been well-controlled with proton pump inhibitors. Medical history is notable for hypertension, arthritis, and an abdominal aortic aneurysm repair. Medications include pantoprazole, aspirin, Inderal and Diovan. Review of systems is notable for the absence of dysarthria, visual changes, or weakness. Physical examination notes an oropharynx without visible mucosal lesions, intact dentition, and that the neck is without masses, lymphadenopathy, or thyromegaly. Neurologic examination is notable for a normal cranial nerve and sensorimotor function. A bedside water swallow does not elicit evidence of oral stage deficits or aspiration.

The patient is referred to a gastroenterologist who performs an upper endoscopy that does not demonstrate any abnormality other than a small, sliding hiatal hernia. Esophageal biopsies are normal. An upper gastrointestinal study (without videofluoroscopy of the pharyngeal swallow) confirms the presence of the hernia without an esophageal stricture. High-resolution esophageal manometry study is performed that shows weak peristalsis with 20% of water swallows and normal lower esophagogastric junction relaxation. High intrabolus pressure is noted immediately proximal to the upper esophageal sphincter (UES) (Figure 1*A*). A videofluoroscopic swallowing study (VFSS) demonstrates a prominent cricopharyngeal bar (CP bar) (Figure 2). Endoscopy is repeated in conjunction with passage of a 57F Savary dilator over a guidewire. On follow-up 6 weeks later, the patient reports marked improvement in his dysphagia. Follow-up manometry demonstrates improvement in UES function (Figure 1*B*).

The Problem

Dysphagia is common in elderly people, reported in 15% of individuals older than the age of 65. Although xerostomia and loss of dentition might contribute to swallowing difficulty, an underlying etiology can usually be identified. Dysphagia is subdivided into oropharyngeal and esophageal origins. Associated aspiration, nasal regurgitation, drooling, or additional neurologic or laryngeal symptoms are indicative of an oropharyngeal process. Localization to the supersternal notch is not specific for an oropharyngeal disorder, because about 30% of patients with distal esophageal obstruction perceive the obstruction to be in the cervical esophagus. In the case under discussion, the characterization of the dysphagia and physical examination did not readily define an esophageal or oropharyngeal cause, leading to an initial evaluation for esophageal disorders. Dysphagia in elderly people raises concerns for esophageal malignancy, but the chronic nature of the symptoms in this case point to a benign etiology. An esophagogastroduodenoscopy and upper gastrointestinal study were performed that focused on the esophageal phase of swallowing. Radiologists do not always include pharyngeal imaging on a routine upper gastrointestinal study. Moreover, the events that occur during the 1-second interval of the pharyngeal phase of swallowing are difficult to capture on static radiographic imaging. Instead, oropharyngeal dysphagia is best assessed by means of a VFSS performed by a speech language pathologist. VFSS primarily assesses functional deficits that are the most common causes of oropharyngeal dysphagia. In addition, the protocol evaluates airway protection, examines the effectiveness of maneuvers to improve swallowing, and provides recommendations on the means of nutrition delivery. However, VFSS does not provide medical diagnoses and does not routinely assess esophageal pathology. Mucosal or structural lesions caused by infections or neoplasia are uncommon causes of oropharyngeal dysphagia and better visualized by endoscopy. Fiberoptic endoscopic examination of swallowing (FEES) has been used to assess and monitor pharyngeal dysphagia. The technique involves transnasal, endoscopic visualization of the pharynx during swallowing maneuvers. Advantages of FEES include portability of the equipment and lack of radiation exposure. Disadvantages of FEES include the limited visualization during the midpoint of the pharyngeal phase and during both the oral and esophageal phases of deglutition. In the assessment of oropharyngeal dysphagia, esophageal manometry is primarily a research tool. In the case under discussion, high-resolution manometry detected a significant functional abnormality of the UES. It also served to exclude an unrecognized esophageal motility disorder as a possible alternative explanation for dysphagia. Nevertheless, the clinical utility of esophageal manometry in the routine evaluation of oropharyngeal dysphagia is unproven.

Abbreviations used in this paper: **CP bar, cricopharyngeal bar; EoE, eosinophilic esophagitis; FEES, fiberoptic endoscopic examination of swallowing; GERD, gastroesophageal reflux disease; UES, upper esophageal sphincter; VFSS, videofluoroscopic swallowing study.**

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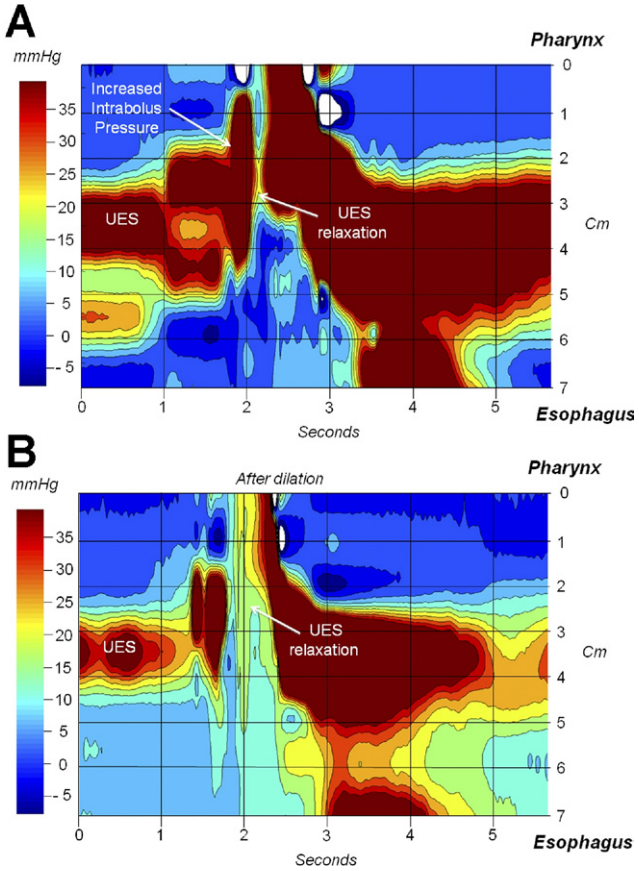

Figure 1. High-resolution esophageal pressure topography focusing on UES during 5-mL water swallow. (*A*) UES profile in patient with symptomatic CP bar demonstrating short sphincter relaxation and elevated intrabolus pressure within and proximal to UES. (*B*) Pressure topography study of same patient after esophageal dilation. Although still abnormal, there is an obvious improvement in UES opening, resulting in reduction of hypopharyngeal intrabolus pressure.

Dysphagia in elderly people is most commonly caused by oropharyngeal disorders (Table 1). The increased prevalence of dysphagia in elderly people is attributed to specific neuromuscular disorders that increase with aging, primarily stroke but also Alzheimer's disease and Parkinson's disease. Dysphagia occurs in approximately one third of stroke patients and is an important predictor of institutionalization, subsequent hospital readmission, and mortality. Although aging is associated with demonstrable decline in pharyngeal physiological function, the clinical significance of these changes is unclear because most patients with such deficits are asymptomatic. If significant oropharyngeal dysphagia is identified without an apparent cause, neurology consultation and evaluation for treatable etiologies such as thyrotoxicosis, inflammatory myopathy, and myasthenia gravis is reasonable. With widespread medication use among elderly people, prescriptions should be reviewed, particularly for centrally acting drugs. Imaging of the central nervous system might be indicated and should include the brainstem as well as cerebral cortex. Although medullary nuclei directly innervate the oropharynx, recent advances in functional brain imaging have elucidated an important role of the cerebral cortex in swallow function. Asymmetry in the cortical representation of the pharynx provides an explanation for the dysphagia that occurs as a consequence of unilateral cortical cerebrovascular accidents.

Dysfunction of the UES is a primary cause of oropharyngeal dysphagia. Evaluation and treatment of UES disorders that include Zenker's diverticulum and CP bar cross the domains of speech pathology, otorhinolaryngology, and gastroenterology. The UES is identified manometrically as a 2- to 3-cm focus of elevated pressure between the hypopharynx and the esophagus. The UES is primarily composed of the transversely oriented muscle fibers of the cricopharyngeus, with contributions from the inferior pharyngeal constrictor and thyropharyngeus muscles. The cricopharyngeus is a C-shaped muscle that has attachments on the lateral aspects of the cricoid cartilage at about the level of the C5-C6 vertebral interspace. The inferior fibers of the cricopharyngeus merge with the circular muscle of the esophageal body. Transport of food across the UES is dependent on 4 factors: UES relaxation, superior-anterior laryngo-hyoid elevation, generation of hypopharyngeal pressure, and distention of the relaxed UES.

CP bar is a common radiographic finding, reported in from 5%–19% of patients undergoing dynamic pharyngeal radiography. The prevalence is certainly lower in the general population, but estimates have not been reported. A CP bar appears as a prominent, persistent posterior indentation at the level of the lower third of the cricoid cartilage (Figure 2). Most CP bar patients do not report dysphagia. When symptomatic, CP bars most commonly present in elderly people with dysphagia for solids, but rare cases have been reported in infants. CP bars are often difficult to appreciate endoscopically but might be associated with difficulty of esophageal intubation. The mucosa overlying the CP bar is normal. Histologic studies have demonstrated muscle degeneration and fibrosis similar to that described within the cricopharyngeus with Zenker's diverticulum. Because a CP bar is often an asymptomatic condition, other

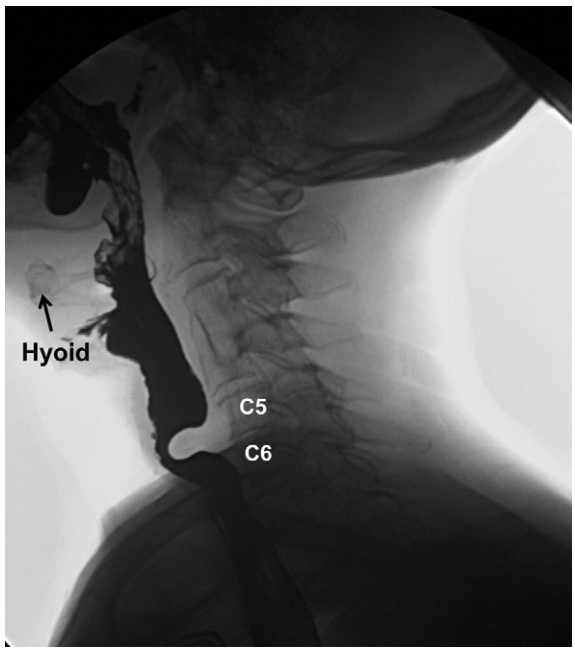

Figure 2. Still image from cine esophagogram demonstrating a prominent CP bar. The bar is seen as a posterior impression arising at the level of the C5-C6 vertebral bodies.