

# SWALLOWING NEWS

*The Newsletter of The Joy McCann Culverhouse Center for Swallowing Disorders  
University of South Florida Health Sciences Center, Tampa, Florida*

Volume 12

November 2000

Number 2

## *Director's Forum*

### **UPDATE ON GERD: WHAT'S NEW IN RESEARCH AND PATIENT CARE**

*H. Worth Boyce, M.D.  
Professor of Medicine & Director*

New developments will be introduced for any disorder that is increasing in frequency and is associated with significant complications and so it is with gastroesophageal acid reflux disease (GERD). Although medical therapy for GERD has improved tremendously with the introduction of the proton pump inhibitor (PPI) drugs (Prilosec, Prevacid, Aciphex, Protonix) over the past decade, there are some individuals who fail to respond adequately to these medications or who dislike taking medication over the long term. Several innovative methods have been developed and are being investigated as means for tightening the esophageal-stomach junction to control acid reflux. There are a number of mechanical devices that have been developed including endoscopic sewing machines with instruments that allow for tying knots and cutting sutures. Another instrument is capable of placing staples through an endoscope. Some of these methods can be done through the oral route using an operative endoscope and others are made through a single, small site entry in the abdominal wall and stomach working from the stomach side of the esophagogastric junction. A tubular valve has been developed that is sewn into position at the junction of the esophagus and stomach. A vicryl scarf is applied around the junction of the esophagus and stomach to create scarring intended to improve the competence of the typically weakened lower esophageal sphincter.

The endoscopic sewing instrument was developed in England and is being evaluated as a minimally invasive procedure performed with flexible endoscopy via the mouth without a surgical incision in the abdomen or chest. Both the sewing machine and the related operative procedure for treatment of reflux recently have been approved by the FDA. Although promising results initially observed in only 107 patients with specific indications were reported earlier this year, there has not been sufficient long-term experience to recommend this technique for general use. In another American multi-center study on 64 patients, there was a significant reduction in heartburn severity and regurgitation. Complications were uncommon and most patients were able to go home within a few hours.

In addition to the mechanical techniques mentioned above, others have been investigating injection and thermal methods. The injection of collagen and Teflon around the junction of the esophagus and stomach for the treatment of GERD has been evaluated in both animals and a few patients. These techniques have not proven

efficacious because of doubts about long-term efficacy and the tendency of injected materials to disperse from the original site of injection. Others have injected sclerosing solution such as sodium morrhuate around the gastroesophageal junction to produce scarring and thereby narrow the sphincter area with reduction of acid reflux. This has only been studied in animals and does not appear promising. There has been renewed interest in inert biocompatible polymers that can be injected into tissues for the treatment of reflux. This material (Polytef) precipitates as a spongy mass and is currently being evaluated in humans.

A thermal method for sclerosing or scarring of the esophagogastric junction using YAG laser has been evaluated in animals and a few patients but no data are available on this procedure. The latest thermal technique is the so-called Stretta procedure using radio frequency for sclerosis in the region of the lower esophageal sphincter. This device also was recently approved for use by the FDA. A balloon is passed through the mouth into the stomach and inflated at the level of the esophagogastric junction. Four hooked needles emerge from four sheaths arranged radially around the balloon. The balloon is pulled back into position and the needles pass through the mucosa (inner lining layer) and into the muscle layer. A radio frequency current is delivered to the four needle electrodes and water is delivered simultaneously at the base of each needle to keep the surface cool and prevent injury to the most superficial layer. Thermocouples measure the temperatures in and at the surface of the tissue. The technique has been shown in animals to increase the resistance of the sphincter and thereby reduce reflux. The actual mechanism of action of this method is uncertain. Results from the initial 28 patients indicate that significant symptom improvement occurred with a reduction in acid reflux. In these clinical trials, using both the sewing and radio frequency methods, only patients with very minimal esophagitis and small hiatal hernias were treated. There is yet no evidence that either method will be successful in more complicated cases or maintain its effect for an extended period of time.

It is wise to be cautious about accepting these treatments for GERD as efficacious until far more research involving large numbers of patients have been completed and followed for a significant period of time. The proven methods to provide adequate therapy for GERD continue to be adequate suppression of gastric acidity using proton pump inhibitors (PPI) or laparoscopic

**Continues on page 2**

Continued from page 1

fundoplication.

In August the American Gastroenterological Association released the results of its nation wide survey on nighttime heartburn. In this study of 1000 American adults with heartburn, significant results included: 1) 79% of those who suffer from heartburn experience at least some symptoms at night; 2) 75% of the patients said that it affects their ability to sleep; 3) 50% said their symptoms were worse at night and 4) 40% said nighttime heartburn affects their ability to work the next day.

A significant number of patients fail to get relief from GERD, especially heartburn, while taking even double doses of PPI medication. The occurrence of nocturnal acid breakthrough in such patients has been recently recognized. PPI drugs work well during the day when meals are stimulating stomach acid output but they are less effective during the night. H<sub>2</sub> blockers (Tagamet, Zantac, Pepcid, Axid) work best in the absence of food stimulation so they are now recommended to be added at bedtime and often provide good relief of nocturnal GERD symptoms.

Recent research suggests that the commonly used heartburn medication ranitidine (Zantac) taken in combination with alcoholic beverages can cause blood alcohol levels to become dangerously high even with light to moderate drinking. It is appropriate to heed this warning of the possibility of developing unexpected functional impairment when drinking amounts of alcohol that might otherwise be considered safe.

A recent study reported in the Journal of the American Medical Association has found that a genetic analysis of families with severe childhood reflux disease suggests that most of the cases are hereditary. The possible genetic origins of pediatric and adult-onset forms of GERD have been hotly debated but the possibility has gained strength in recent years following reports of familial clustering of reflux symptoms. The article also suggests that reflux disease is often not considered as a causative factor in children especially in those that have symptoms of croup or chronic bronchitis that can be caused by acid regurgitation and aspiration into the lungs especially during sleep.

An analysis of five families with multiple members who suffered from GERD in childhood revealed the presence of a possible genetic marker for the disease on chromosome 13q14. The inheritance appears to be autosomal dominant with high penetrance which means the disease traits are highly likely to be transmitted. Studies are now underway to determine if genetic traits are also present in adults with GERD.

A recent study reported from Emory University School of Medicine indicated that of 25 patients with GERD and 154 healthy controls, 63% of the GERD patients had at least one symptom related to reflux in childhood compared to 35% of the controls. The adults with GERD reported higher rates of spitting up as an infant, abdominal or chest pain or burning, difficulty swallowing, low body weight, asthma and medical or surgical treatment for GERD.

Numerous reports over the past several years have shown that the extrasophageal manifestations of GERD, especially asthma, hoarseness, morning sore throat and non-cardiac chest pain are often associated with acid reflux. The technique of ambulatory 24-hour pH (acid reflux) monitoring has identified several associations between GERD and non-esophageal symptoms that include non-cardiac chest pain, 50%; asthma symptoms, 50-80%; chronic cough, 20-30% and otolaryngologic (ear, throat and lar-

ynx) symptoms, 30-50%. Adult onset asthma is an especially well documented association with GERD.

It has been reported that acid reflux worsened but heartburn symptoms were not aggravated when a non-steroidal anti-inflammatory drug, ibuprofen, was given to patients with GERD. A 42% increase in the amount of acid reflux was shown when this medication was taken, however, this change was not appreciated since it caused no change in symptoms. The major concern here is that asymptomatic acid reflux induced by a pain relieving medication may obscure progressive damage to the esophageal tissue. At this time it is prudent to use such medications with caution if a patient has known esophageal reflux.

Esophageal disorders, abdominal pain and rectal and anal hemorrhage were the most common reasons for patients to visit gastroenterologists' offices last year according to a recent report. Gastroenterologists in the United States received more than 26 million visits from patients during a 12 month period representing a 6% increase over the previous 12 months. The total number of prescriptions written by gastroenterologists increased by 4% to reach 35.2 million and retail sales of those prescriptions reached 2.7 billion, a 19% increase.

### ***Things To Remember***

1. **OFFICE HOURS:** 8:00 a.m. 'til 4:30 p.m. Monday through Friday. Telephone hours: 8:00 a.m. 'til 6:00 p.m.

Also, our emergency telephone number for after hours is (813)-974-2201.

2. **BILLING:** Payment for services rendered is due at the time of your visit. Please be prepared to pay any co-payments due at the time of your visit to the Center.

Patients who have problems with their physician or facility fee bills should contact Gayle Stephens, Financial Specialist, at the University of South Florida Medical Clinics at (813) 974-3575 between the hours of 9:00 a.m. and 4:00 p.m. Monday through Friday.

For those patients who are from out-of-town, a new toll-free number has been added for you to call with billing questions. The number is 1-888-873-3627. This number is for calls originating in Florida and is only for billing questions and help with insurance authorizations.

### **HAS YOUR INSURANCE COMPANY OR PRIMARY CARE PHYSICIAN CHANGED?**

With an ever changing medical insurance market (shopping for the best contract, companies merging, others closing their doors, etc.), you may have changed insurance company. If you changed your insurance company you may have a new primary care physician. Maybe you have moved and had to choose a new doctor closer to your home. Regardless of the circumstances we would very much appreciate your contacting our office to let us know, (813) 974-3374. This will not only insure we can obtain the necessary authorizations/pre-certifications and that your medical bills go to the right insurance company but it will help us make sure your medical records are forwarded to the right doctors. Thank you for helping us keep the records straight.

# ESOPHAGEAL DIVERTICULA

Milton C. Johnson, M.D.

A diverticulum is defined as a pouch or sac opening from a tubular or saccular organ. The pouch has a single opening at one end and is otherwise blind. Diverticulum refers to a single pouch while diverticula is the term for more than one or multiple pouches along the same tubular structure or hollow organ. The esophagus in its proximal, mid, distal extent and the pharynx (throat) at its junction with the esophagus may be so affected or prone to develop these pouches.

Three types of diverticula are associated with the esophagus and surrounding structures. They include pharyngoesophageal diverticula; esophageal diverticula, proper; and esophageal intramural (within or confined to the wall), so called pseudodiverticula.

Pharyngoesophageal diverticula were first described in the literature in 1769 by Ludlow. In 1877, Zenker and Ziemssen reviewed what was known about pharyngoesophageal diverticula. Thereafter, the name Zenker became identified with this type and today is referable as a Zenker diverticulum. Zenker diverticula form by protrusion of the posterior hypopharyngeal mucosa (back

of the throat lining tissue) between the oblique (diagonal) fibers of the inferior pharyngeal constrictor and transverse fibers of the cricopharyngeus (two most important muscle groups of the throat) located immediately above (proximal to) the esophagus. As defined, Zenker diverticulum is not a "true" diverticulum of the

esophagus, but rather of the associated hypopharynx (back of throat) just above the esophagus (Figure 1). Conditions that may contribute to Zenker diverticula formation include a poorly relaxing and uncoordinated cricopharyngeus muscle (upper esophageal sphincter) and the development of high pressures in the hypopharynx (back of throat).

Patients who develop Zenker diverticula typically present by age 50 years. They report a range of symptoms which may include difficulty swallowing (dysphagia) solid foods and liquids associated with coughing and choking (aspiration) periodically, a gurgling sound or bulge in the left neck upon swallowing, regurgitation of undigested food material minutes to hours after swallowing or upon lying down to bed, and in some, the "worst" halitosis (bad breath) one has ever experienced.

The best diagnostic test for the presence of a Zenker diverticulum is a barium esophagram with lateral views of the pharynx

and esophageal junction. Endoscopes and nasogastric tubes of any type must be passed with care in patients suspected to have this type of diverticulum since their tips may become trapped in the blind pouch.

Symptomatic Zenker diverticula require surgical management in patients who are candidates. Various types of surgical techniques have been applied to these diverticula. No single choice has proven better than the others. Surgical division of the cricopharyngeus muscle (upper esophageal sphincter) with or without complete removal of the diverticulum has been the favored technique used. Several endoscopic methods of treatment have been described but are not adequately evaluated. Pre-operative video-fluoroscopic and manometry studies of pharyngoesophageal function are advisable. These studies will provide a baseline for follow-up post-operatively with symptom resolution or return of symptoms at some later date.

It is important to note that in a single series of patients with long-standing Zenker diverticula there was a 0.4% incidence of squamous cell carcinoma in a 53 year period of follow-up. Spindle cell carcinoma and benign tumors have also been reported to occur in pharyngoesophageal diverticula. Surgery is the treatment of choice for these tumors.

Diverticula that occur in the middle or distal esophagus are often thought to represent the more traditional concept of "esophageal diverticulum". Historically, traction (pulling) forces occurring within the mediastinum (middle chest cavity) due to infection or inflammation may predispose to scar formation that extends to the esophageal wall. They have therefore been called "traction diverticula". They may be single or multiple, small or large. The distal esophageal diverticula are thought to be related to motility abnormalities within the distal esophageal segment. They are typically called "pulsion diverticula" since they are believed to result from the abnormal pressure generated from within the esophagus. Due to their general location, immediately above and adjacent to the diaphragm, they are referred to as "epiphrenic diverticula" (Figure 2).

They are typically single, but may be multiple, small or large-mouth in size and most often occur on the right side of the esophagus. Some proponents (experts) believe that both mid-esophageal and distal esophageal diverticula are related. They are probably both most commonly secondary to disorders of esophageal motility. The best diagnostic approach to their presence is a barium esophagram.

Esophageal diverticula are not commonly symptomatic. Ingested liquids, air, or food will enter the diverticulum and subse-

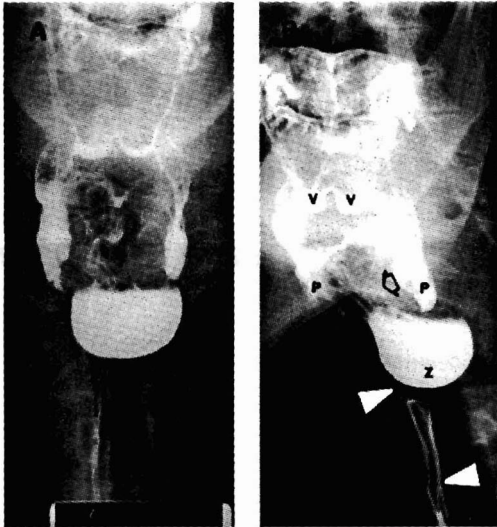


FIGURE 1. (A) Anterior View and (B) Oblique View (Z) Zenker Diverticulum with opening at open arrow Esophagus (white arrows) (P) Piriform Sinuses (V) Valliculae

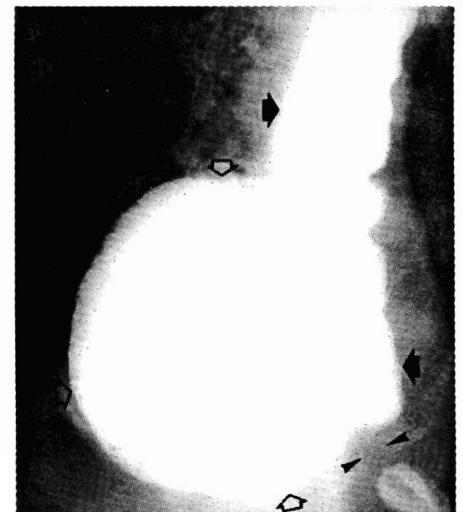


FIGURE 2. Epiphrenic Diverticulum (open arrows) Barium filled esophagus (large black arrows) Closed LES (between small black arrows)

quently spill out into the lumen of the esophagus as the boluses continue their descent down the esophagus. Significant delay in bolus passage will depend upon the altered esophageal motility pattern, the size of the diverticulum, and the relationship of the diverticular opening to the actual "line" which the liquid or solid bolus takes as it passes from the mouth down the length of the esophagus. If the diverticular opening is in the "exact line" of passage of the bolus, and the altered motility pattern of the distal esophagus creates angulation, then the diverticulum enlarges as it fills over time. The enlarging diverticulum thus creates more angulation of the esophagus as it enlarges and compresses the adjacent esophageal wall. Dysphagia and regurgitation of diverticular contents may occur. Great care is required when examining the esophagus with one or more diverticula. The esophageal lumen must be followed under direct vision to where it angulates and continues distally into the stomach. Symptomatic diverticula require treatment. The underlying motility disorder should be evaluated by esophageal manometry. Investigation for the presence of a distal esophageal stricture must be performed by esophagoscopy. Dilation may be advantageous if a stricture is confirmed. Diverticulectomy (removal of the diverticulum surgically) is reserved for very large diverticula with associated severe esophageal deformity and symptomatic dysphagia and regurgitation which does not improve with medical management.

Finally, esophageal pseudodiverticula should be mentioned. Pseudodiverticula are not true diverticula. They represent small intramural (within the wall) "outpouchings" within the glands that secrete mucus in the esophageal wall. The inciting factor that leads to dilation of these glands and their small tubular openings is inflammation. The tissue swelling from inflammation results in a blockage in the tubular opening (ducts) of these lining glands (submucosal) leading to a sac-like dilation giving the appearance of small, multiple outpouchings ("pseudodiverticula"). Fibrosis and scar (stricture) is associated with 70 to 90% of these pseudodiverticula. Treatment of the underlying inflammation or infection and dilation of the esophageal stricture results in disappearance of the pseudodiverticula in the majority of cases. Esophageal diverticula do not disappear with medical treatment alone. Fortunately, surgical removal is not often necessary.

***This edition of Swallowing News was supported by an educational grant from AstraZeneca.***

**Joy McCann Culverhouse  
Center for  
Swallowing Disorders  
University of South Florida**

University of South Florida Health Sciences Center  
12901 Bruce B. Downs Blvd., MDC Box 72  
Tampa, FL 33612

## Medical Staff

Director ..... H. Worth Boyce, M.D.  
Professor of Medicine  
Hugh F. Culverhouse Chair  
in Esophagology

Medical Staff ..... James F. Helm, M.D., Ph.D.  
Associate Professor of Medicine

Milton C. Johnson, M.D.  
Assistant Professor of Medicine

Patient Care ..... Janet L. Jones, B.A., CGC  
Coordinator ..... Instructor in Medicine

Assistant Patient Care ..... Nancy A. Kirk, L.P.N.  
Coordinator

Office Manager ..... Candace K. Harley

Administrative Secretary ..... Natalie A. Ralyea

Laboratory Technician ..... John A. Rodriguez

Clerk Specialist ..... Alvina Parson

## Speech Pathology Consultants for Oropharyngeal Swallowing Disorders

Speech Pathology.....Joy B. Gaziano, M.A., CCC/SLP

Linda Stachowiak, M.S., CCC/SLP

**Postgraduate Course: December 7-9, 2000  
Esophagology for Clinicians:  
Swallowing Disorders and Esophageal Diseases  
at Disney's Boardwalk Inn, Orlando, Florida. For  
information contact USF Office of Professional  
Education at (800) 852-5362 or  
[www.cment.med.usf.edu](http://www.cment.med.usf.edu).**

NON-Profit Organization  
U.S. Postage  
PAID  
Tampa, FL  
Permit No. 1632