Dysphagia means difficulty eating or swallowing. The symptom can either be due to abnormal nerve-muscle function or a blockage of the swallowing pathway between the mouth and stomach. Blockage or obstruction can be due to several causes, most of which respond well to proper esophageal dilation (stretching).

It is imperative to define the type of esophageal narrowing to be dilated since the response may be different for different conditions. The term stenosis is defined by Dorland's medical dictionary as a “narrowing or stricture of a duct or canal.” This then is a generic term for abnormal narrowing without reference to cause. Stenosis may be due to spasm, inflammation, deposition of scar (fibrotic) or tumor (neoplastic) tissue. Stenosis due to spasm or inflammation alone does not respond well to standard dilations. The definition for a stricture is a “decrease in the caliber of a canal, duct or other passage as a result of cicatricial contraction or the deposition of abnormal tissue”. This presentation will discuss the techniques and results for dilating true complex strictures. Complex strictures are usually those related to cancer, lye or radiation injury, nasogastric tube/acid reflux related, anastomotic strictures (after surgery), those due to drug injury by quinidine gluconate (Quinaglute) and congenital esophageal strictures.

After an initial thorough evaluation and pre-dilation investigations by barium esophagram and endoscopy, it is helpful to classify the stricture in order to select the proper dilator and understand the prognosis. Potential difficulties with stricture therapy can be predicted by determining several factors: etiology or cause of the stricture, and the estimated depth, length and location of the injury based on pre-dilation investigations. These anatomic determinants include etiology, lumen diameter, angulations and associated inflammation, ulceration or determinants. All of these factors must be considered in planning dilation therapy, selecting the proper dilator and determining the frequency for dilation.

All strictures and patients have a personality of their own and consequently should not all be treated in the same manner. Remember: “all strictures are not created equal.”

If the pre-dilation assessment has been complete, the physician can properly counsel the patient regarding the predicted treatment plan. Misunderstanding and disappointment can be minimized if the patient is properly informed about these complex strictures that are most likely to require either a prolonged initial series of dilations or periodic dilations in the future.

Principles of Peroral Dilation

There are two important principles that appear to provide an added measure of safety for esophageal dilation of both benign and malignant strictures. The first is to avoid being in a hurry, i.e., attempting to fully dilate a severe stricture at one sitting. Most strictures have been present from months to many years and the treatment program should not be limited to one session, especially for those with transmural (full thickness) disease. My recommended practice is to pass only three dilators per sitting (the “Rule of 3’s”), if moderate to severe resistance is encountered. The physician who performs peroral dilation should not be concerned with hurrying therapy unnecessarily and standing a chance of hurting the patient by passing too many dilators too often, or by passing dilators with large increments in diameter in rapid sequence.

The second principle is to be aware of the position or location of the dilator and/or guide wire tip at all times. Precise control of the dilator guide wire tip and dilator is important for safe dilation, especially during the initial treatment sessions for a difficult, angulated or eccentric lumen through a stricture. There are two schools of thought regarding the need for fluoroscopic control during esophageal dilation. An experienced operator can safely dilate many simple benign strictures without fluoroscopy but for very tight or tortuous
strictures there is general agreement that fluoroscopic control is a wise practice. Fluoroscopic control is the best method for proper positioning and utilization of all dilators in the majority of patients with complex strictures, whether or not endoscopic assistance is needed.

Instruments for Peroral Esophageal Dilation

Variations in anatomy of esophageal strictures are to be expected. As a result, the physician who elects to manage these patients should be well prepared by way of having multiple technical equipment options available for use.

Dilator diameters are measured in French (Fr) units. One French unit equals 0.33 mm (i.e. 15 Fr = 5 mm and 45 Fr = 15 mm, etc.) Mercury-filled rubber or tantalum-filled plastic dilators with tapered tip (Maloney) are supplied from Fr. 12 to 60, each being 2 Fr. wider than the preceding. Dilators of less than Fr. 36 are so flexible that minimal effective pressure may be transmitted from above and consequently tight strictures are not reliably dilated by these sizes.

The best addition to the dilation armamentarium is the Savary thermo plastic dilator. This dilating system consists of a set of tapered-tip dilators in graduated diameters from 15 to 60 Fr. (5-20mm) that are passed over the Savary flexible-tip guide wire. This wire is made with a unique spring tip with progressive flexibility from proximal to distal end that prevents the tip from acutely retroflexing upon itself.

Metal olives (Eder-Puestow) in sizes Fr. 21 to 53 attached to a flexible metal rod and passed over a guide wire with flexible spring tip are rarely used currently for initial therapy of tight or tortuous strictures, but are very helpful in selected patients. This type of dilator is safe and effective when used by physicians who are properly trained.

Hydrostatic balloon dilators that may be passed via the endoscope (TTS or through-the-scope dilators) recently have been made available in low compliance models for stricture dilation. Available balloon sizes, fully inflated, range from 4 to 20mm and are available in 1 mm increments in the larger sizes. These dilators are filled by injecting water (hydrostatic) to specific pressures and are most effective for simple reflux strictures and rings and are helpful in selected cases for the initial dilation stages of complex strictures. TTS balloons do not dependably inflate to maximum diameter in severe strictures, especially those due to transmural fibrosis. Consequently, the degree of dilation is not always what it is expected to be. There is yet no proof that these instruments are any safer or more effective than other dilators. The perforation risk of these dilators for severe strictures, such as those due to caustic ingestion and irradiation, has not been determined.

(The next issue of CSD News will contain Part II of Management of Difficult Esophageal Strictures)
chemicals such as histamine cannot stimulate the parietal cells to secrete acid. The PPI’s are, therefore, said to block the “final common pathway” of acid secretion as long as they are present in the blood circulation.

Inhibition of the proton pump by proton pump inhibitors (PPI), therefore block the final common pathway for acid secretion. This is the mechanism associated with the greater potency of the proton pump inhibitors (PPI’s) (Prilosec and Prevacid) compared to drugs which block the binding sites of attachment for histamine on the cell, the $H_2$RA’s.

It has been demonstrated that PPI’s heal peptic ulcers and relieve pain more rapidly than the $H_2$-receptor antagonists ($H_2$RA). Faster healing rates and more rapid resolution of symptoms associated with more severe grades of esophagitis (Savary-Miller classification: Grades III-IV) have been described with PPI’s when compared to the $H_2$RA. Higher doses of PPI’s and/or a longer duration of therapy are required for patients with severe esophagitis (Grades III-IV). Patients 60 years of age or older with symptomatic gastro-esophageal reflux disease (GERD) may require more aggressive antisecretory therapy with a PPI.

Columnar-lined esophagus (CLE or Barrett esophagus) is a condition resulting from severe acid injury; and is a consequence of severe gastroesophageal reflux, which results in intestinal metaplasia (a condition which increases the risk for dysplasia and adenocarcinoma of the esophagus). There is, however, no evidence that potent acid suppression can prevent or decrease the changes of intestinal metaplasia. Dysplasia (early premalignant cellular changes) associated with intestinal metaplasia can neither be prevented nor altered by proton pump inhibitor therapy or other acid suppression therapy once it occurs. There is no evidence that the risk of adenocarcinoma of the esophagus is altered by long-term acid suppression therapy by PPI’s once columnar-lined esophagus associated intestinal metaplasia is present or with or without dysplasia.

Omeprazole (Prilosec) doses of 20 to 40mg per day or lansoprazole (Prevacid) doses of 30 mg per day inhibit more than 90% of 24-hour acid secretion compared to 50% to 80% inhibition of 24-hour acid secretion by standard doses (lowest effective doses which improve acid-related symptoms) of $H_2$RA’s. Twenty-four hour acid secretion is minimum when higher doses of PPI’s are used. Higher doses of $H_2$RA’s will result in further inhibition of 24-hour acid secretion by the parietal cell, but their effect does not approach the PPI’s ability to block acid secretion. Long-term use of higher doses of $H_2$RA’s compared to single doses of PPI therapy is also more expensive, in most areas of the country, when cost analysis is performed for patients requiring long-term treatment.

(continued)
Omeprazole (Prilosec) and lansoprazole (Prevacid) have a short serum half-life when compared to newer PPI's (pantoprazole, rabeprazole). All of the PPI's are structurally similar. Laboratory testing demonstrates that a single dose of any PPI effectively inhibits acid secretion for greater than 24 hours. This is the basis for FDA-approved labeling of omeprazole and lansoprazole for use as first line agents in the treatment of symptomatic gastroesophageal reflux disease (GERD) with or without accompanying esophagitis. Certainly, pantoprazole and rabeprazole will have similar FDA approval once they are released for general clinical use. Pantoprazole 40mg per day or rabeprazole 20mg per day have appeared in research reports to be equivalent to omeprazole 20mg per day in the short term (less than or equal to 8 weeks) treatment of gastric and duodenal ulcers.

PPI's inhibit both daytime (including meal-stimulated) and nocturnal (unstimulated) acid secretion. H$_2$RA's are effective against nocturnal acid secretion, but have limited effects on meal-stimulated, i.e. daytime acidity. This probably accounts for PPI's ability to more effectively heal peptic ulcers and provide more rapid pain relief associated with acid-peptic injury. During Digestive Disease Week 1999 in Orlando, Florida, new data were presented to support the use of a single bedtime dose of H$_2$RA in patients with refractory gastroesophageal reflux disease not completely responsive to double dose PPI therapy. These individuals were discovered to have what is referred to as “nocturnal-breakthrough” symptoms. When PPI's are used twice daily and nocturnal symptoms persist, the addition of a single bedtime dose of an H$_2$RA has been shown to completely abolish the “nocturnal-breakthrough” symptoms. This regimen was found to be more effective than PPI’s given 30 minutes before breakfast, dinner and bedtime (triple-dose PPI regimen).

(Part II of this article will appear in the next CSD Newsletter)

CONTINUING MEDICAL EDUCATION

The Center for Swallowing Disorders has continued active participation in graduate medical education by lectures at regional, national, and international meetings and by contributions to the medical literature.

Lecture Presentations by CSD Staff

1. October 30, 1998: University of South Florida Geriatric Study Group: Esophageal Problems in the Elderly. Tampa, FL (Boyce)
2. May 15-16, 1999: AGA Postgraduate Course: Medication-induced Esophagitis and Caustic Ingestion. Orlando, FL (Boyce)
3. May 17, 1999: ASGE Clinical Symposium: Botox Therapy for Achalasia. Orlando, FL (Boyce)

Contributions To Medical Literature


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