Esophageal Stricture: Symptoms and Treatment

The topic of this article is peptic strictures associated with benign and malignant after-effects of this condition and the management of these ailments as the number of such cases makes up to 80% of all esophageal strictures and represents a great interest for the researchers.
Causes

Three conditions can lead to the development of esophageal stricture.

Intrinsic Diseases

Intrinsic diseases include inflammatory processes as well as fibrosis that arise from the squamous epithelium. Triggering factors for these ailments can be caused by or associated with gastroesophageal reflux disease, esophagitis, or ingestion of chemical
burns (acid or caustic). Strictures can form after esophageal surgery and other treatments such as laser therapy or photodynamic therapy. While the area heals, scars form, causing the tissue to pull and tighten, which leads to difficulty in swallowing.

**In neoplasia**, esophageal cancer infiltrates the wall of the esophagus and grows into the lumen, causing dysmotility and obstruction. These lesions are the cause of the **stenosis** (narrowing) of the esophageal lumen.

### Extrinsic Diseases

Esophageal strictures can be produced by the enlargement of mediastinal lymph nodes due to sarcoidosis, lung cancer, or other space-occupying lesions in the posterior mediastinum, which may lead to significant compression of the esophagus from the outside. An example is dysphagia lusoria, which is caused by an abnormal location of the emergence or branching off of the right subclavian artery from the aorta.

### Other Diseases

Conditions that affect the tunica muscularis also affect the **peristalsis of the esophagus** and its **lower esophageal sphincter (LES)**. The function of the smooth muscles of the organ and its innervation are compromised. It can be a dysfunctional LES or diffusely disordered motility. A typical example is achalasia, the hallmark of which is a failure of the LES to relax.

Esophageal strictures can also involve the entire thickness of the esophageal wall and be **congenital, idiopathic, autoimmune, or iatrogenic**, including medication- or radiation-induced processes.

![Cancer of the esophagus, CT with contrast, axial image.](Image: Cancer of the esophagus, CT with contrast, axial image. By: Tdvorak. License: CC BY-SA 3.0)

### Diagnosis

The diagnosis of esophageal stricture can be confirmed with **radiological methods, endoscopic visualization, and tissue biopsy** as well as **manometry** if dysmotility is suspected.

**Malignant growth** is difficult to diagnose in its early and curable stage because of the location of the esophagus deep in the body and the absence of peritoneal coverage, which helps limit the progression of the malignancy. It can be detected with the help of
CT scans and endoscopic ultrasonography (see image). The majority of benign tumors of the esophagus are accessible for endoscopic examination, pharmacological therapy, or surgery.

Pathophysiology

The causes of peptic esophageal strictures include the following:

- **Gastroesophageal reflux-provoked esophagitis**, originating in the 3-4 cm-long squamocolumnar junction. The most common cause of damage to the esophagus is *gastroesophageal reflux disease* (GERD), or *acid* reflux.
- **Dysfunction of the LES** from decreased pressure in this zone of the esophagus may lead to the development of peptic strictures. LES pressure of < 8 mm Hg contributes to GERD and the development of a peptic stricture.
- **Inappropriate esophageal clearance** is often the consequence of dysmotility; 64% of patients suffering from peptic strictures experience this with peristalsis.
- **Hiatal hernia** affects 10%-15% of the population; 42% of these patients experience reflux with no esophagitis, 63% have esophagitis, and 85% have peptic esophageal strictures.
- **Pepsin** is no longer considered important in the formation of esophageal stricture, although some authors believe that alkaline reflux affects the mucosa of the esophagus.
- **Gastric emptying** may be taken into consideration, although there is no convincing evidence about this factor as a trigger for the condition.

Epidemiology

Approximately 40% of the adult population in the United States experiences gastroesophageal reflux; as well, 7% to 23% of untreated patients with reflux disease also develop esophageal stricture. Up to 80% of esophageal strictures are the result of gastroesophageal reflux; after surgery, strictures make up < 10% of cases; < 5% of cases are attributed to corrosive strictures of the esophagus.

The data for the US have improved since 1989, when **proton pump inhibitors (PPIs)** were administered for the first time.

Age, Gender, and Race

Caucasians are 10 times more susceptible to peptic strictures than African Americans or Asian Americans. However, the relative frequency of esophageal strictures in Black and non-Hispanic whites is was almost as high.

Men are more likely to experience peptic strictures than women (2-3:1).

Older patients are also more likely to experience esophageal strictures because the conditions leading to exposure to the acidic components of gastric juice persist for a longer period of time in these patients.

Clinical Presentation
History

Patients with peptic stricture may experience the following symptoms.

**Heartburn:**

- 25% of patients do not have this symptom.
- May abate when peptic stricture worsens
- Most patients with adenocarcinoma in Barrett’s esophagus (see image) experience long-lasting heartburn.
- Achalasia can cause heartburn as the result of disrupted esophageal motor activity.

**Dysphagia:**

- Progressive dysphagia for liquids and solids may be caused by motility disorders secondary to autoimmune disease (collagen vascular disorder).
- Intermittent and non-progressive dysphagia is often secondary to Schatzki’s ring.
- The obstruction causing dysphagia occurs either immediately above or at the place of the lesion.
- In cases of long-lasting dysphagia with no or slight weight loss and without rapid impairment, a benign type of esophageal stricture should be suspected.
- Rapid deterioration of the patient’s general condition, weight loss, and severe course of the disease are associated with malignancy as the cause of dysphagia.

**Odynophagia (painful swallowing)**

**Food impaction**

**Weight loss**

**Chest pain**

**Atypical symptoms** include a chronic cough and asthma attacks as a secondary symptom of food aspiration

It is important to find out whether the patient was taking regular medication when any of these symptoms manifested.
Physical Examination

In most cases, physical examination is not informative; therefore, it is important to estimate the patient’s level of nourishment. Collagen vascular disease may produce deformed joints, telangiectasia, various rashes, calcinosis, and sclerodactyly.

The most common symptoms of gastroesophageal reflux include the following:

- Hoarseness
- Oropharyngeal erythema
- Tooth decay
- Wheezing
- Discomfort in the epigastric area

**Virchow’s node (left supraclavicular lymphadenopathy)** is sometimes found in adenocarcinoma of the gastroesophageal junction (see image).

Diagnosis and Work-up

**Laboratory Studies**

**Complete Blood Count (CBC)**

No significant changes will be seen in CBC except in cases where the disease has advanced (i.e., there is bleeding from the lesions and carcinoma). In these cases, CBC may reflect a pattern of anemia.

**Liver Profile Studies**

Liver tests may be abnormal in malignant processes with metastasis.

**Complete Metabolic Panel**

A complete metabolic panel allows for an assessment of the nutritional status of the patient with esophageal stricture, especially in patients with significant weight loss.

**Imaging Studies**
Barium esophagography may be accompanied by endoscopic findings, which are more informative (though risky) in cases of diverticula and paraesophageal hernias. As well, barium swallows are more efficient for the diagnosis of latent strictures of the esophagus > 10 mm in diameter (100% sensitivity where the luminal diameter is < 9 mm and 90% when > 10 mm).

Chest radiography is an additional tool that can be used when extrinsic compression is suspected as the reason for the esophageal stricture (posteroanterior and lateral films).

Computed tomography (CT) scan can successfully detect malignant tumors of the esophagus (82% accuracy) (see image).

Endoscopic ultrasound (EUS) is the most accurate method to use in the diagnosis and biopsy of esophageal tumors (92% sensitivity).

Esophagogastroduodenoscopy is more sensitive than any other method in the detection of esophageal stricture as well as esophagitis; confirmation or exclusion of malignant tumors; and biopsy, brush cytology specimens, and intracavitary administration therapy of the condition.

Other Tests

Twenty-four-hour esophageal pH monitoring is useful in the assessment of the efficacy of therapy with PPIs and fundoplication in patients still experiencing symptoms in spite of treatment.

Esophageal manometry is used for the evaluation of the motility of the esophagus especially before surgical intervention (antireflux).

Histological findings at biopsy include the following:

- Edema
- Inflammatory cellular infiltration
- Metaplasia, dysplasia, or high-grade dysplasia of the basal cells
- Presence of goblet cells (Barrett’s esophagus is when the lining of the esophagus changes from its normal lining [squamous cells] to a type usually found in the intestines [goblet cells]).
Vascular abnormalities (reflecting an increase in type 3 collagen depositions on healing)
Progressive inflammation, ulceration, and damage of the muscular layers and the myenteric plexus

Staging

CT (69% accuracy in estimating the depth of tumor, 82% accuracy in assessing spread within organs) and EUS (92% accuracy assessing the depth of lesions) can help detect the stages of malignant growth.

Medical Management

- Mechanical dilatation
- Administration of PPIs for acid suppression
  - Omeprazole 20 mg/d is more efficient than ranitidine 300 mg twice a day.
  - In one study, repeated dilatation in patients treated with omeprazole 20-40 mg/d was 41% in comparison with 73% in patients taking ranitidine 150–300mg twice per day.
  - PPI treatment is cheaper than H2 blockers.

Surgical Intervention

- Dilation via endoscopy
- Intraliesional steroid injection
- Endoscopic stricturoplasty
- Pharyngoesophageal puncture
- Expandable polyester silicone-covered stent

References

Esophageal Stricture via medscape.com
Esophageal stricture via wikipedia.org
Benign Esophageal Stricture via healthline.com

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