

1- ESOPHAGITIS

Inflammation of the esophagus is accompanied initially by clinical findings of spasm and obstruction, pain on swallowing and palpation, and regurgitation of bloodstained slimy material.

ETIOLOGY

Primary esophagitis caused by the ingestion of chemical or physical irritants is usually accompanied by stomatitis and pharyngitis. Laceration of the mucosa by a foreign body or complications of nasogastric intubation can occur.

Nasogastric intubation is associated with a higher risk of pharyngeal and esophageal injury when performed in horses examined for colic. This can be related to the use of larger diameter nasogastric tubes to provide more effective gastric decompression, the longer duration of intubation in some horses, or the presence of gastric distension resulting in increased resistance to tube passage at the cardia.

Death of *Hypoderma lineatum* larvae in the submucosa of the esophagus of cattle can cause acute local inflammation and subsequent gangrene.

PATHOGENESIS

Inflammation of the esophagus combined with local edema and swelling results in a functional obstruction and difficulty in swallowing.

CLINICAL FINDINGS

In the **acute** esophagitis, there is salivation and attempts to swallow, which cause severe pain, particularly in horses. In some cases, attempts at swallowing are followed by regurgitation and coughing, pain, retching activities, and vigorous contractions of the cervical and abdominal muscles. If the esophagitis is in the cervical region, palpation in the jugular furrow causes pain and edematous tissues around the esophagus can be palpable.

In specific diseases such as mucosal disease and bovine malignant catarrh, there are no obvious clinical findings of esophagitis, because the lesions are mainly erosive.

CLINICAL PATHOLOGY

In severe esophagitis of traumatic origin, a marked neutrophilia can occur, suggesting active inflammation.

NECROPSY FINDINGS

Pathologic findings are restricted to those pertaining to the various specific diseases in which esophagitis occur. In traumatic lesions or those caused by irritant substances, there is gross edema, inflammation and, in some cases, perforation.

DIFFERENTIAL DIAGNOSIS

Esophagitis must be differentiated from **pharyngitis**, in which attempted swallowing is not as marked and coughing is more likely to occur.

Palpation can also help to localize the lesion; however, pharyngitis and esophagitis usually occur together.

TREATMENT

- 1- Feed should be withheld for 2 to 3 days and fluid.
- 2- electrolyte therapy can be necessary for several days.
- 3- Parenteral antimicrobials are indicated, especially if laceration or perforation has occurred.
- 4- Reintroduction to feed should be monitored carefully and all feed should be moistened to avoid the possible accumulation of dry feed in the esophagus, which might not be fully functional.

2- ESOPHAGEAL OBSTRUCTION

Esophageal obstruction can be **acute or chronic** and is characterized clinically by the inability to swallow, regurgitation of feed and water, continuous drooling of saliva, and bloat in ruminants.

Acute cases are accompanied by signs of distress including retching and extension of the head. Horses with choke commonly regurgitate a mixture of saliva, feed, and water through the nostrils because of the anatomic characteristics of the equine soft palate.

ETIOLOGY

Obstruction can be intraluminal and caused by swallowed material or extraluminal caused by pressure on the esophagus by surrounding organs or tissues. Esophageal paralysis can also result in obstruction, for example, in horses with grass sickness.

A- Intraluminal Obstructions

Intraluminal obstructions are usually caused by ingestion of materials that are of inappropriate size and that then become lodged in the esophagus:

- Solid obstructions, especially in cattle, by turnips, onions, potatoes, peaches, apples, oranges, and similar objects.
- Feedstuffs are a common cause of obstruction in horses and occasionally in other species. Most impactions are caused by routine feedstuffs. Improperly

soaked sugarbeet pulp, inadvertent access to dry sugarbeet pulp, and cubed and pelleted feed can cause the disease in horses when eaten quickly.

- Eating while sedated
- Foreign bodies in horses include pieces of wood, antimicrobial boluses, and fragments of nasogastric tubes.
- Poor dentition

B- Extraluminal Obstructions

- Enlarged lymph nodes in the mediastinum (tuberculosis, neoplasia, *Rhodococcus equi*, *Corynebacterium* spp., strangles, and secondary to pleuritis)
- Cervical or mediastinal abscess
- Persistent right aortic arch
- Thymoma
- Megaesophagus and caudal esophageal muscle hypertrophy

C- Esophageal Paralysis

Esophageal paralysis can be caused by congenital or acquired abnormalities of the esophagus, and there are many examples of such abnormalities that interfere with swallowing and cause varying degrees of obstruction, even though it may be possible to pass a stomach tube through the esophagus into the stomach or rumen.

Esophageal paralysis, diverticulum, or megaesophagus has been recorded in horses and in cattle. Congenital hypertrophy of esophageal musculature and esophago-tracheal fistula has been found in calves.

Megaesophagus is a dilatation and atony of the body of the esophagus usually associated with asynchronous function of the esophagus and the caudal esophageal sphincter. It occurs sporadically in cattle and in horses with preexisting esophageal disease. It is usually a congenital condition.

Other Causes of Obstruction

- Carcinoma of stomach causing obstruction of cardia
- Squamous cell carcinoma of the esophagus of a horse
- Esophageal hiatus hernia in cattle
- Paraesophageal cyst in a horse
- Esophageal duplication in a horse
- Congenital anomalies.
- Cranial esophageal pulsion (pushing outward) diverticulum in a horse
- Esophageal phytobezoar in a horse
- Esophageal mucosal granuloma
- Traumatic rupture of the esophagus from an external injury (e.g. a kick)
or during treatment using a nasogastric tube
- Esophageal paralysis can also be associated with lesions of encephalitis, especially in the brainstem.

The case–fatality rate for simple choke treated in the field is approximately 2%, while that in presumably more severe cases treated in referral institutions is approximately 12%.

PATHOGENESIS

An esophageal obstruction results in a physical inability to swallow and, in cattle, inability to eructate, with resulting bloat. In acute obstruction, there is initial spasm at the site of obstruction and forceful, painful peristalsis and swallowing movements. Complications of esophageal obstruction include laceration and rupture of the esophagus, esophagitis, stricture and stenosis, and the development of a diverticulum.

Acquired esophageal diverticula can occur in the horse. A traction diverticulum occurs following periesophageal scarring and is of little consequence. An esophageal pulsion diverticulum is a circumscribed sac of mucosa protruding through a defect in the muscular layer of the esophagus.

Causes that have been proposed to explain pulsion diverticula include excessive intraluminal pressure from impacted feed, fluctuations in esophageal pressure, and external trauma. Complications associated with esophageal diverticula include peridiverticulitis, pulmonary adhesions, abscesses, and mediastinitis. Esophageal stricture and subsequent obstruction secondary to impaction of a diverticulum can also occur. In megaesophagus, the esophagus is dysfunctional, dilated, and filled with saliva, feed, and water. This results in regurgitation and can lead to aspiration pneumonia.

It can be congenital or secondary to other lesions and has been associated with gastric ulceration in foals. Using esophageal manometry, the normal values

for esophageal pressure profiles in healthy horses, cows, and sheep have been recorded. The body of the equine and bovine esophagus has two functionally different regions: the caudal portion and the remainder of the esophageal body (cranial portion).

CLINICAL FINDINGS

Acute Obstruction

- 1- **Acute Obstruction** or Choke Cattle The obstruction is usually in the cervical esophagus just above the larynx or at the thoracic inlet. Obstructions can also occur at the base of the heart or the cardia.
- 2- The animal suddenly stops eating and shows anxiety and restlessness.
- 3- There are forceful attempts to swallow and regurgitate, salivation, coughing, and continuous chewing movements.
- 4- If obstruction is complete, bloating occurs rapidly and adds to the animal's discomfort.
- 5- Ruminal movements are continuous and forceful and there can be a systolic murmur audible on auscultation of the heart. However, rarely is the bloat severe enough to seriously affect the cardiovascular system of the animal, such as occurs in primary leguminous (frothy) bloat.
- 6- The acute signs, other than bloat, usually disappear within a few hours. This is caused by relaxation of the initial esophageal spasm and can or cannot be accompanied by onward passage of the obstruction.
- 7- Many obstructions pass on spontaneously, but others can persist for several days and up to a week. In these cases, there is inability to swallow, salivation, and continued bloat. Persistent obstruction causes pressure

necrosis of the mucosa and can result in perforation or subsequent stenosis caused by fibrous tissue construction.

- 8- Horse In the horse with esophageal obstruction caused by feed, the obstruction can occur at any level of the esophagus from the upper cervical region all the way to the thoracic portion.
- 9- The ingestion of large quantities of grain or pelleted feed can cause obstruction over a long portion of the esophagus.
- 10- clinical finding is dysphagia with nasal reflux of saliva, feed, and water. Affected horses will usually not attempt further eating but will drink and attempt to swallow water.
- 11- External palpation of the cervical esophagus can reveal a firm cylindrical swelling along the course of the neck on the left side when the esophagus is obstructed with feed. In cases of foreign-body obstruction such as a piece of wood, there can be no palpable abnormality.
- 12- The endoscope allows determination of the rostral but not the distal limit of the obstruction.

Chronic Obstruction

- 1- **Chronic Obstruction** No acute signs of obstruction are evident and in cattle the earliest sign is chronic bloat, which is usually of moderate severity and can persist for several days without the appearance of other signs.
- 2- Rumen contractions can be within the normal range. In horses and in cattle in which the obstruction is sufficiently severe to interfere with swallowing, a characteristic syndrome develops.

- 3- Swallowing movements are usually normal until the bolus reaches the obstruction, when they are replaced by more forceful movements.
- 4- Dilatation of the esophagus can cause a pronounced swelling at the base of the neck.
- 5- The swallowed material either passes slowly through the stenotic area or accumulates and is then regurgitated.
- 6- Projectile expulsion of ingested material occurs with esophageal diverticula, but water is retained and there is no impedance to the passage of the stomach tube. In the later stages, there can be no attempt made to eat solid food, but fluids can be taken and swallowed satisfactorily.
- 7- When there is paralysis of the esophagus, as in megaesophagus, regurgitation does not occur, but the esophagus fills and overflows, and saliva drools from the mouth and nostrils. Aspiration into the lungs can follow.
- 8- Passage of a stomach tube or probang is obstructed by stenosis but can be unimpeded by paralysis.

CLINICAL PATHOLOGY

- 1- **Radiographic examination** is helpful to outline the site of stenosis, diverticulum, or dilatation, even in animals as large as the horse.
- 2- **Radiologic examination** after a barium swallow is a practicable procedure if the obstruction is in the cervical esophagus.

- 3- Viewing of the internal lumen of the esophagus with a **endoscope** has completely revolutionized the diagnosis of esophageal malfunction.
- 4- **Biopsy samples of lesions and tumor masses** can be taken using the endoscope.

DIFFERENTIAL DIAGNOSIS

- The clinical findings of acute esophageal obstruction in cattle and horses are usually typical but can be similar to those of :**esophagitis, stomatitis and pharyngitis**.
- The excitement, sweating, and tachycardia observed in acute choke in the horse often suggests **colic**.
- **Mediastinal lymph node enlargement** is usually accompanied by other signs of **tuberculosis or lymphomatosis**.
- **Chronic ruminal tympany in cattle** can be caused by ruminal atony, in which case there is an absence of normal ruminal movements.
- **Diaphragmatic hernia** and **vagus indigestion**
- **Equine encephalomyelitis**

TREATMENT

Conservative Approach

Many obstructions will resolve spontaneously and a careful conservative approach is recommended. It can require several hours of monitoring, reexamination, and repeated sedation before the obstruction is resolved.

During this time, the animal should not have access to feed and water.

Sedation In acute obstruction, if there is marked anxiety and distress, the animal should be sedated before proceeding with specific treatment.

Administration of a sedative can also help to relax the esophageal spasm and allow passage of the impacted material. For sedation and esophageal relaxation in the horse, one of the following is recommended:

- Acepromazine 0.05 mg/kg BW intravenously
- Xylazine 0.5 to 1.0 mg/kg BW intravenously
- Detomidine 0.01 to 0.02 mg/kg BW intravenously
- Romifidine 0.04 to 0.12 mg/kg intravenously.