<u>Surgical Affection of Esophagus (5th theory surgery lecture 2</u>

Dr. khalaf H.A. El-Budari

The esophagus is a musculo-membranous tube, serves to carry food, water and saliva from the pharynx to the stomach. It's connecting pharynx with the stomach. The whole length of esophagus divided into cervical, thoracic, and short abdominal parts, the average diameter approximately one to two inches.

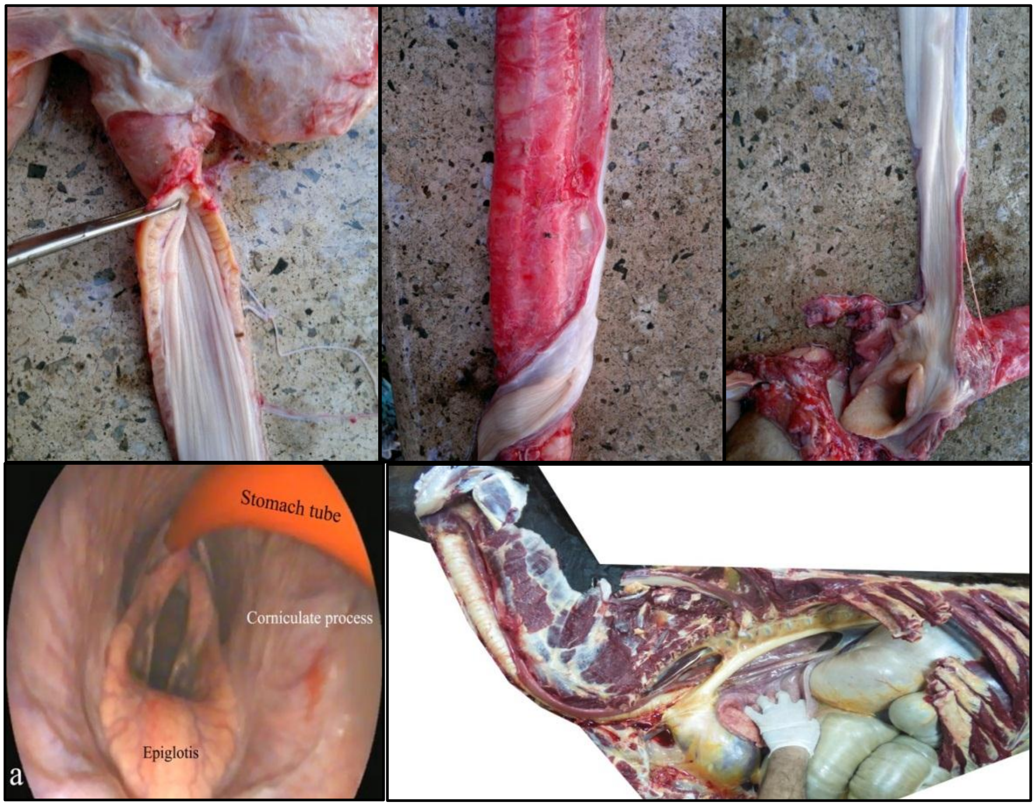
Occupies almost dorsal position at origin and passes gradually to left side of the trachea at the level of about 4th cervical vertebrae. Thereafter it occupies the left position of trachea to 3rd thoracic vertebrae. After thoracic region it is enters the abdominal cavity through hiatus esophagus and terminates at the cardia of the stomach.

The movement of esophagus muscle called peristalsis. About 125 to 200 cm in length in adult horse depending on the size of the horse.

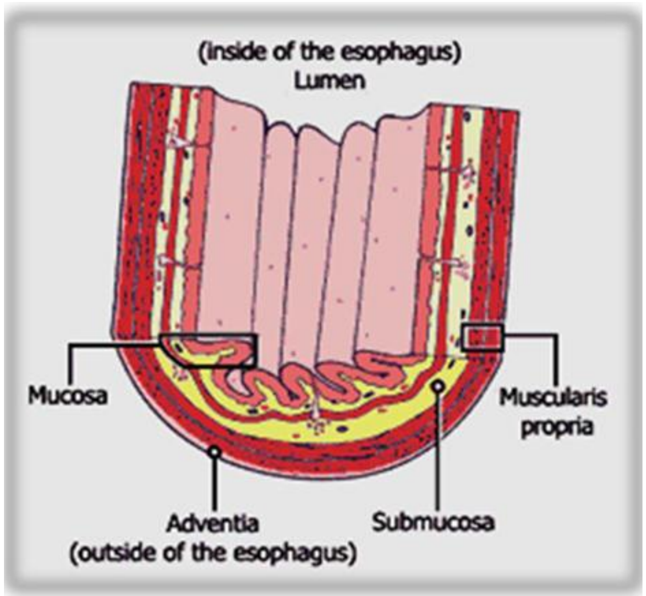
Peristalsis is a series of wave-like muscle contractions that move food through the digestive tract. It starts in the esophagus where strong wave-like motions of the smooth muscle move balls of swallowed food to the stomach. There, the food is churned into a liquid mixture called chyme that moves into the small intestine where peristalsis continues.

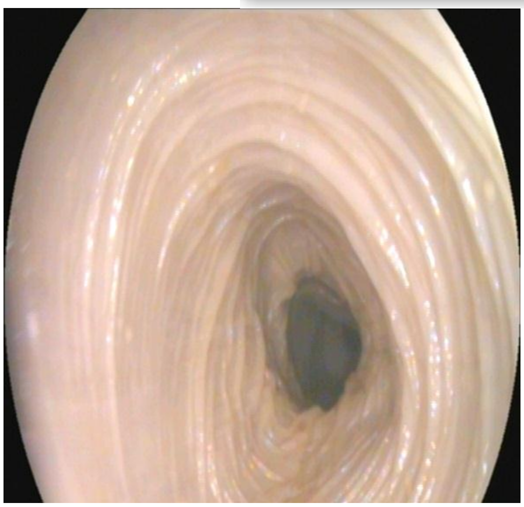
In the large intestine peristalsis helps water from undigested food be absorbed into the blood stream. Then, the remaining waste products are excreted through the rectum and anus.

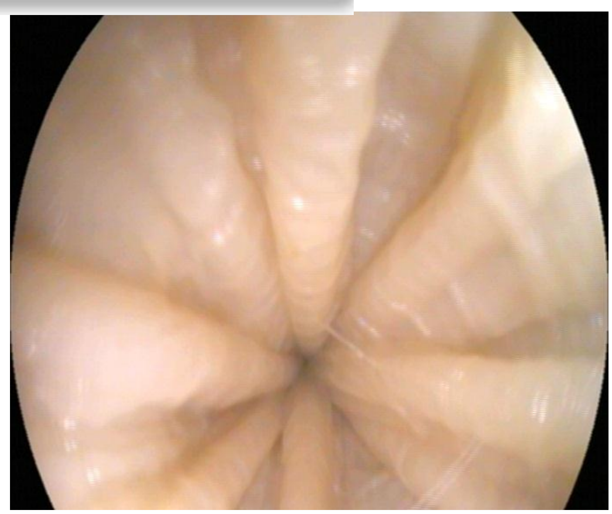
The esophagus normally is difficult to be palpated due to its softness texture except in case of swallowing where it can be palpated on the left jugular groove between the brachiocephalicus and sternocephalicus muscles.



Esophageal wall: is composed of mucosa, submucosa, muscularis and serosa that contain longitudinal and transverse folds in movement.







Blood supply: esophagus is by branches of:

Carotid, brachio - esophageal and gastric arteries.

Nerve supply: to esophagus is by:

vagus, glosso-pharyngeal and sympathetic nerves.

The most important relations of the cervical part:-

1. Common carotid artery.

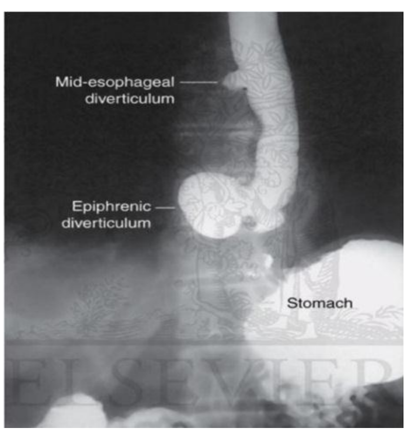
2. Jugular vein.
3. Trachea.
4. Cervical lymph nodes.
5. Vago-sympathatic trunk.
6. Caudal (recurrent) laryngeal nerve
7. Thymus in young animals.

Surgical disease of esophagus:

1. Esophageal obstruction (choke).
2. Esophageal foreign bodies.
3. Esophageal diverticulum.
4. Esophageal stenosis or strictures.
5. Esophago-Tracheal fistula.
6. Gastroesophageal intussusception
7. Hiatal hernias.
8. Neoplasm.

Esophageal Diverticula:

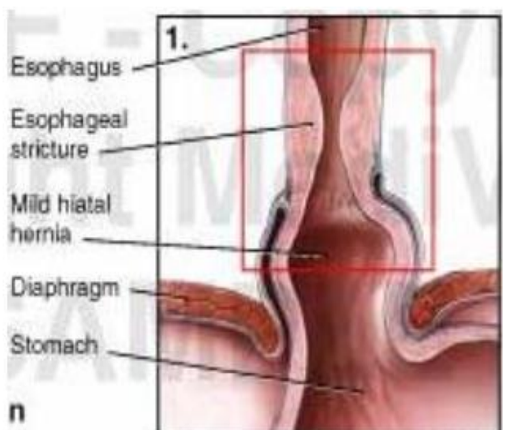
Is circumscribed sacculations in the wall of esophagus that interfere with the normal esophageal motility patterns. The esophageal diverticula may be congenital or acquired.

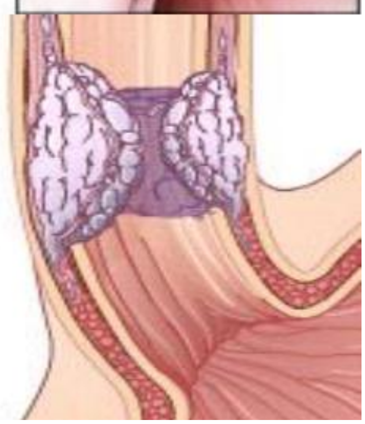


Narrowing of the esophagus:-

The causes of esophageal narrowing are:-

1. There is a stricture from formation of scar tissue as a result to a wound caused by sharp objects after local pressure, necrosis or after esophagotomy. It can also occur after severe esophagitis particularly from caustics.
2. Neoplasia of the esophagus particularly squamous cell carcinoma and papilloma decreases the diameter of the lumen.
3. Abscess of the esophageal wall.
4. Pressure from outside the esophagus causes obstruction to the passage of feed, and in ruminants may cause chronic bloat e.g. enlargement of the mediastinal lymph nodes in cattle (often tuberculosis).
5. Goiter if large, causes pressure on the esophagus.
6. In dogs narrowing due to injury following general anesthesia caused by reflux of acidic gastric contents.
7. In dogs also infestation of Spirocerca lupi causing granulomatus growth in the esophagus and narrowing.





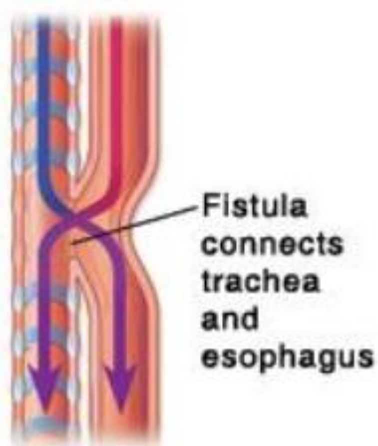
Types of esophageal fistulas:

1. Tracheo - esophageal fistula.

2. Broncho - esophageal fistula:
   Is an abnormal opening between the esophagus & bronchus. It may be congenital (rare) or acquired (foreign body & pulmonary disease).

Tracheo-esophageal Fistula (TEF):

Is an abnormal opening between the trachea and the esophagus. In embryo the trachea and esophagus start as one tube. Then, they are supposed to separate into two tubes. But if the wall of tissue between the trachea and esophagus doesn't form fully, an opening between the two tubes remains. This is a fistula. during eats, food can pass from the esophagus through the fistula into the trachea. This can cause breathing problems. include drooling and coughing up mucus.



Clinical signs:

1. Coughing, which may be associated with drinking liquids.
2. Regurgitation.
3. Lethargy.
4. Anorexia.
5. Pyrexia.
6. Dyspnea.
7. Weight loss.

Diagnosis:

1. clinical signs.
2. contrast radiography.

Treatment:

The treatment of esophageal fistula depened to the site of fistula :

<u>-Cervical esophageal fistula:</u>

In acute cases may need treatment with open drainage.

<u>-Bronchoesophageal fistula:</u>

A lateral thoracotomy is performed, the fistulous tract is excised rather than ligated, the esophageal defect can usually be closed primarily.if the extensive lesion in the communicating lung lobe, the lung lobectomy is necessary .

<u>-Tracheoesophageal fistula:</u>

The tracheal defect is closed primarily or reconstructed.

Esophageal obstruction (Choke):

Definition:

Esophageal obstruction (choke) is that intraluminal blockage of esophagus. occurs when the esophagus is obstructed by food or foreign objects. It is the most common esophageal disease in large animals. Horses most commonly obstruct on grain, beet pulp, or hay. Esophageal obstruction can also occur after recovery from standing chemical restraint or general anesthesia. Cattle tend to obstruct on a single solid object, eg, apples, beets, potatoes, turnips, corn stalks, or ears of corn.

Etiology:

Intraluminal causes: Example:

- Vegetable (Turnip), fruits (large size lemon and apple).
- Meat ball, tennis ball, woods, plastic etc.

Extraluminal causes: Example:

- Large peri-esophageal abscess.
- Enlarged mediastinal lymph nodes and tumors.
- Nutritional deficiencies, Dry feed.

- Greedy nature of feeding of ruminants.
- Esophageal stenosis.

Symptoms:

- Swelling in the ventral neck region.
- Inability of the animal to swallow feed and water.
- Hyper salivation
- Animals keep the neck stretched.
- Severe tympany occurs in complete choke
- The patient remains hungry and makes attempts to drink water which often revenues back through the nostrils caring food particles with it.
- If obstruction continue for longer duration than it leads to perforation of esophagus due to pressure necrosis.
- Regurgitation of swallowed food and water may cause cough and aspiration pneumonia.

Diagnosis:

- Based on history, clinical signs and physical examination.
- Obstruction to cervical region can be easily palpated.
- Radiographic examination with contrast media like barium salt past.
- Endoscopic examination in case of perforation

1. The clinical signs of esophageal obstruction are usually diagnostic.
2. Physical examination findings compatible with esophageal obstruction include:
    a) nasal discharge of feed material and water.
    b) bruxism,
    c) ptyalism.
    d) palpable enlargement of the esophagus; in some instances, foreign objects lodged in the cervical esophagus may be located via palpation.
    e) Subcutaneous emphysema.
    f) cervical cellulitis.
    g) fever may be associated with esophageal rupture.

h) The inability to pass a stomach (ruminants) (horses) by nasogastric tube can also confirm the diagnosis.

3. An endoscopic examination helps localize the site of esophageal obstruction, type of obstructing material, and extent of esophageal ulceration. Because of the risk of aspiration pneumonia, the respiratory tract should be evaluated carefully, including auscultation of the heart and lungs and thoracic radiography.

Treatment:

- Esophageal obstruction is usually not life threatening as long as care is taken to control development of ruminal tympany.
- All extraluminal obstruction needs surgical correction.
- The treatment for intraluminal obstruction can be categorized as conservative and surgical.

Principles which successes the esophageal surgery:

1. Gentle handling of tissue.
2. Minimization of contamination.
3. Appropriate selection & application of suture material.
4. Appropriate use of electrocautery.
5. Accurate apposition of tissues.

Surgical treatment

Esophagotomy

Control and Anaesthesia

1. The position of animal is right lateral recumbency after proper sedation.
2. Anaesthesia is by general anaesthesia in small animals or by local infiltration analgesia at the site of operation.

Surgical Technique

3. An incision about 5cm the length of foreign body should be made on skin and subcutaneous tissue.
4. The omohyoideus muscle is separated from upper and lower structure. The areolar tissue is bluntly dissected with the help of fingers.

5. The trachea is recognized to locate the esophagus on its lateral surface.
6. The esophagus is drawn out and fixed in position by placing intestinal forceps proximally and distally to foreign body.
7. Operative field is now packed off to avoid any chance of contamination
8. Make an incision on dorsal wall of esophagus either anterior or posterior to obstruction. The incision should be large enough to extract the obstruction / foreign body.
9. The repair of esophageal incision can be done in two layers. The mucous membrane can be sutured with mattress sutures or continuous sutures using round bodies swaged needle. The muscularis layer is to be sutured with continuous lock stitch pattern. The distance between two sutures should not exceed 2-3 mm in small animal and 5mm in large animal.
10. Irrigate the area well with sterile saline mixed with antibiotic solution before routine skin closure
11. The esophagus is replaced in its original position.
12. The skin wound is closed in routine manner or it is left as open wound.

Post-operative Care:

Do not allow solid food for few days and intravenous feeding is done twice daily.

A course of antibiotics is to be completed (4-5 days)

Antiseptic dressing of the wound should be carried one till healing is complete or when sutures are removed after 8-12 days.

Complications:

1. Esophageal rupture.
2. Septic mediastinitis or pleuropneumonia.
3. Intrathoracic esophageal rupture is typically fatal.
4. Esophageal stricture.

Important Consideration/ Remarks

1. Check hemorrhage during surgery
2. If esophagus is empty it is recognized by passing a stomach tube.

3. During dissection, prevent damage to recurrent laryngeal nerve.