COLLEGE OF VETERINARY MEDICINE

UNIVERSITY OF AGRICULTURE

ABEOKUTA

LECTURE NOTES

COURSE TITLE: SOFT TISSUE SURGERY AND LAMENESS

COURSE CODE:VCS 503 **COURSE UNIT: 3**

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LECTURE 13: SURGERY OF THE NECK IN HORSES (LARYNGEAL VENTRICULECTOMY, TRACHEOSTOMY AND OESOPHAGOSTOMY)

I LARYNGEAL VENTRICULECTOMY

INTRODUCTION

- Laryngeal hemiplegia occurs in the horse when there is a paralysis of the left recurrent laryngeal nerve followed by paralysis of the intrinsic muscles of the larynx.
- These paralysis results in failure of the affected side of the larynx to dilate during inspiration; so that the flaccid vocal cord with a relaxed arytenoids cartilage encroaches on (i.e obstructs) the lumen of the larynx.
- During exercise, inspiratory dyspnea results in production of a characteristics noise known as “roaring” or “whistling”.
- Roaring is a recognized unsoundness in horses and this warrants correction.
- The cause of the nerve damage and subsequent muscle paralysis is yet to be understood. Possible trauma or congenital.

DEFINITION

- Laryngeal ventriculectomy is the stripping of the mucous membrane of the laryngeal succule via the lateral ventricle in order to widen the airway and prevent obstruction on inspiration.

INDICATION

- Laryngeal hemiplegia (roaring).

ANAESTHETIC REQUIREMENT

- General anaesthesia (i.e. Gaseous inhalation with trachea intubation.
- Standing chemical restraint with local anaesthesia (Xylazine +Acepromazine +Lignocaine)

PRE-OPERATIVE

- Prepare the throat region for surgery
  - Share any hair
  - Scrub with povidone
  - Drape appropriately for asepsis

SURGICAL PROCEDURE

- Make a 10- 12cm midline skin incision over the larynx from a line joining the posterior borders of the mandibular rami to the level of the first tracheal ring.
- Dissect through the midline junction of the omohyoid and sternothyrohyoid muscles and place a Rigby self- retaining retractor to hold the muscles apart.
- Expose the larynx and identity the crico-thyroid ligament (the ligament is triangular and its edges are bordered by the wings of the thyroid cartilage which converge to a point posteriorly and is crossed by a pair of blood vessels)
- With the point of the scalpel blade, make an incision along the exact midline of the circothyroid ligament and its underlying mucous membrane extending anteriorly to the body of the thyroid cartilage and posteriorly to the cricold cartilage (exercise great care not to damage either cartilages).
- Inspect the interior of the larynx and the component structures (the lateral ventricle is located under the vocal cord; and to obtain a good view of it, the vocal cord should be retracted laterally).
- Remove the mucous membrane of the left laryngeal saccule in its entirely by hookings its mucosa on the edges of burr which is

passed through the lateral ventricle in a postero-ventral direction till it engages the depth of the laryngeal saccule.

- Push the burr firmly and slowly rotate it until it picks up the entire mucous membrane (continue this slowly and at the same time gradually withdraw the blurr from the ventricle wit the attached mucous membrane).
- The laryngeal saccule is thus twisted to evert the membrane.
- Clamp the base of the saccule with a gall bladder forceps and remove the burr.
- Apply traction on the laryngeal saccule (with the gall bladder forceps to ensure it's completely everted) and cut with myo-scissor along is attachment to the edge of the lateral ventricle.
- Leave the incision/operative site open to drain.

POST-OPERATIVE CARE

- Confine/ rest the horse in stable for 10wks.
- Clean the wound of all discharges two or three times daily.
- Healing takes place by granulation in about 3-4 wks

POSSIBLE COMPLICATION

- Laryngeal obstruction due to oedema
- Laryngeal spasm
- Chondroma of either the typhoid or circoid cartilages

PREVENTION/MANAGEMENT OF COMPLICATION

- Place a laryngotomy/tracheotomy tube to guard against laryngeal obstruction by post-operative oedema and also to prevent spasm of the larynx.
- Avoid injuring the cartilages during the operation. (Halsted principle of surgery: be gentle on tissue/gentle handling of tissue).

II. TRACHOSTOMY

DEFINITION

- TRACHEOTOMY: Vertical split (incision) in the anterior wall of the trachea at the level of the 3rd and 4th cartilaginous rings.
- TRACHEOSTOMY: Fenestration in the anterior wall of the trachea by removal of a circular piece of cartilage (from the 3rd and 4th rings, species dependent), for establishment of a safe airway and reduction of dead space.
- It could be temporary or permanent tracheostomy.

INDICATION.

- To relieve dyspnea due to stenosis or acute high obstruction
- Substitute for laryngeal ventriculectomy to relieve the effect of paralysis of the intrinsic muscles.
- Fracture of the tracheal ring
- Tracheal Neoplasm
- Ossification of larynx.
- For placement of a trachostomy tube (permanent tracheastomy).

ANAESTHETIC REQUIREMENT

- Horse standing under sedation (xylazine 0.5-1. 1mg/kg i/v or 1.1-2.2mg/kg/ $^{1}/_{m}$) and local analgesia (lignocaine 2%).

N.B: Under sedation, the horse lowers its head thus an assistant should support its head and neck extended so that the trachea is fixed and accessible.

- Prepare the surgical site (i.e. shave and scrub).

SURGICAL PROCEDURE:

- Make a longitudinal skin incision, 6 –7cm in length over the 4^{th} to 6^{th} tracheal rings in the midline of the under aspect of the neck.
- Dissect longitudinally the aponeurosis of the sternohyoid muscles to expose the trachea.
- Hold apart the skin and muscles by a self-retaining retractor and ligate/control any bleeding point.
- Use the plug of the tracheotomy tube to be inserted as a guide to gauge the size of the disc to be removed.
- Using a solid scalped, incise a semi-disc of cartilage from two adjacent tracheal rings (This leaves a strip of each ring intact and prevents the ring from collapsing.)
- Insert the scalpel blade through the annular ligament and severe the upper ring while the disc of cartilage being removed is sized securely with kocher forceps (this prevents the possibility of the incised disc from slipping and getting lost into the trachea).
- Complete the circular incision through the cartilage and remove the disc. (thus a tracheal window is created).
- Insert the tracheotomy tube and place a permanent (self-retaining tube and set it in place.
- Excise semicircles of skin and suture the edges around the tube

POSSIBLE COMPLICATION AND POST-OPERATIVE CARE

- Oedema and mucous discharges due to local inflammatory reaction.
- Remove the tube and clean ; lubricate daily until the border of the fistula is firm.
- Keep the central stopper (plug) for the tube in place except during exercise to prevent accidental inhalation of foreign materials.

III. OESOPHAGOTOMY

DEFINITION: An opening /incision into the oesophagus.

INDICATION (Cervical oesophagotomy)

- To relieve pharyngeal and cervical oesophageal obstruction caused by intra-oesophageal masses.
- To feed a valuable animal that has pharyngeal paralysis.

ANAESIHETIC REQUIREMENT

- General anaesthesia with tracheal intubation.

SURGICAL PROCEDURE

- Position the horse on dorsal recumbency and support the nose to prevent over extension of the neck.
- Make a 20cm midline incision starting at the cricoid cartilage.
- Dissect through the sternothyrohyoid muscles and retract the trachea to the right side.
- Identify the oesophagus and dissect free the carotid artery and vagus nerve (Exercise great care to avoid damaging these structures and the left recurrent laryngeal nerve)
- Insert a large-bore tube per os into the oesophagus to aspirate its contents, immobilize it and serve as a ‘cutting broad’ to protect the deeper layer during incision.
- Use extra moistened drapes to isolate the oesophagus before you open it.
- Make a 7-8cm longitudinal incision (preferably over the obstructing mass or just caudal to it in healthy tissue. The length of

the incision also depends on the mass) through the oesophageal wall and then elevate the incision edges with tissue forceps.

- Aspirate the lumen and remove the obstructing object.
- Irrigate the surgical field liberally with normal saline
- For esophagostomy; (i.e when a fistula is to be created as indicated for feeding), suture the oesophageal mucosa to the skin. And the fistula created should be large enough to allow easy passage of a large –bore stomach tube.
- Close the oesophagus with 2 continuous row of suture using chronic catgut in a simple pattern.

POST –OPERATIVE CARE

- Allow only water for the first 24 hours after surgery
- Soft bran and chopped grass and green food can be fed for a week
- Do not allow hay to be fed until the skin sutures are removed.

POSSIBLE COMPLICATION AND MANAGEMENT

- Post operative local oedema; apply cold pack.
- Wound dehiscence; pain and fever after the first 2 days (i.e. on the 3^{rd} or 4^{th} day). Drain the surgical site and clean it daily until granulation takes place.