

Surgical Management of Tracheal Disorders

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Tracheal and bronchial disorders

- Congenital
- Acquired

Tracheal and bronchial disorders

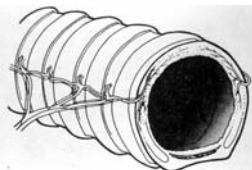
- Tracheostomy
 - Temporary
 - Permanent
- Tracheal resection anastomosis
 - Neoplasia
- Tracheoplasty
 - Collapsing trachea

Tracheal and bronchial disorders

- Trachea
 - Larynx to carina
- Bronchi
 - Principal: Left and Right
 - Lobar, Segmental, Smaller generation

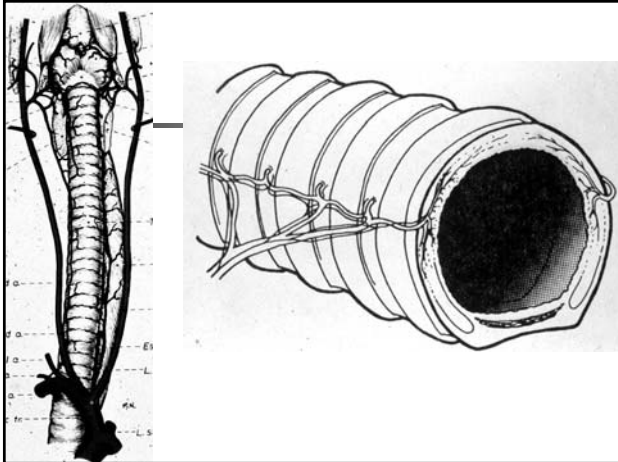
Tracheal and bronchial disorders

- C shaped cartilages
 - 40 in cats
 - 35 to 45 in dogs
- Tracheal muscle
 - Dorsal
 - Diameter of trachea...
- Elastic annular ligament
 - Between rings
 - Stretch and bend



Tracheal and bronchial disorders

- Histology
 - Pseudostratified ciliated epithelium
 - Goblet cells
 - Mucus secreting tracheal glands
- Cranial and caudal thyroid artery
 - Branches between rings
- Bronchoesophageal artery
- Bronchial artery



Tracheal and bronchial disorders

Clinical findings

- Inspiratory and expiratory stridor
- Inspiratory and expiratory dyspnea

- Radiographs
- Fluoroscopy

- Bronchoscopy

Temporary tracheostomy

Indications

- Upper airway obstruction
 - Emergency
 - Short term therapy

- Airway access
 - Ventilation on awake animals

Temporary tracheostomy

Tracheostomy tube

- Different sizes

- With or without cuff
 - Cuff for positive pressure ventilation
 - Low pressure high volume cuff
 - Shiley tracheostomy tube

- With or without inner cannula
 - Inner cannula facilitate cleaning



Temporary tracheostomy

Surgical technique

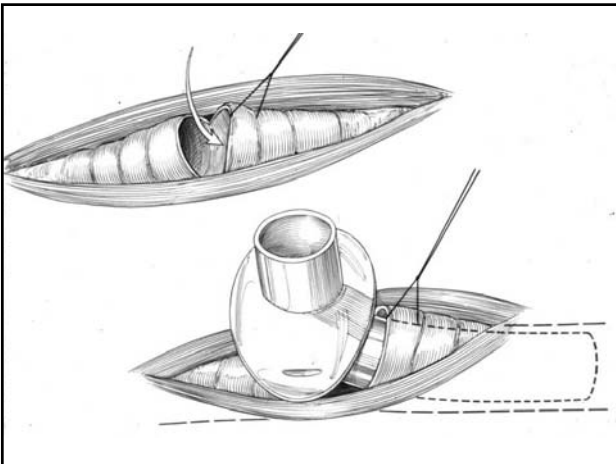
- Light anesthesia or local anesthesia

- Proximal third of trachea
- Dorsal recumbency
- Stabilize trachea between finger
- Midline incision ventral to trachea
- Sternohyoideus muscles separated

Temporary tracheostomy Surgical technique

- Transverse incision between rings
 - 2/5 of circumference of the ring
 - Recurrent laryngeal nerves
- Stay suture caudal ring
 - Long end
- Insert tracheostomy tube

QuickTime™ and a
Sorenson Video decompressor
are needed to see this picture.



Temporary tracheostomy Tracheostomy tube

- Tracheostomy tube cleaning
 - Inner cannula
 - Chlorhexidine
 - Povidone iodine
 - Peroxyde
 - Every 2 to 6 h



Temporary tracheostomy Surgical technique

- Remove tube
- Healing by second intention
- Subcutaneous emphysema
- Drainage

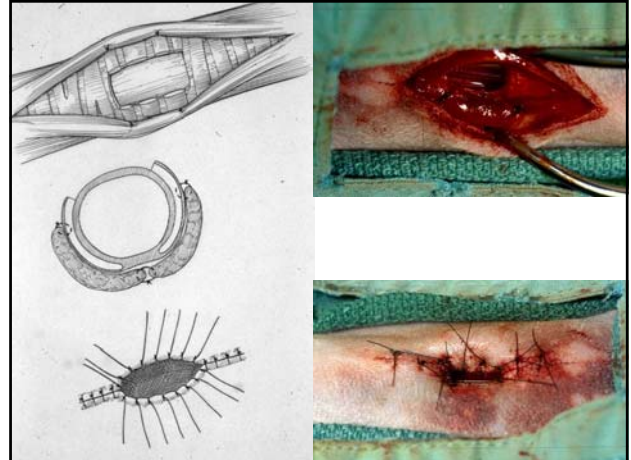
Permanent tracheostomy Indications

- Severe laryngeal collapse
- Neoplasia
 - Pharynx
 - Larynx
- Laryngeal paralysis

Permanent tracheostomy

Surgical technique

- Dorsal recumbency
- Midline incision
 - Caudal to larynx to middle cervical region
- Sternohyoideus muscle
 - Dorsal to trachea
- Oval incision in trachea
 - 3 rings
 - Suture mucosa to skin: 4-0 monofilament



Permanent tracheostomy

Complications

- Chronic respiratory infection
- Inhalation foreign material
- Aspiration of water during bathing or swimming
- Chronic mucous discharge
- Stenosis
 - Cats

Tracheal resection anastomosis

Indications

- Trauma
- Congenital stenosis
- Stricture
- Granuloma

Tracheal resection anastomosis

Indications

- Foreign body
- Neoplasia
 - Adenocarcinoma
 - Chondroma, Osteochondroma
 - Leiomyoma

Tracheal resection anastomosis

Surgical technique

- Segmental blood supply
- Recurrent laryngeal nerve
- Granuloma
 - Monofilament

Tracheal resection anastomosis

Surgical technique

- Avoid tension
- Stenosis
- 5 rings in adults can be removed
- Secondary tension suture
- Cervical flexion

Tracheal resection anastomosis

Surgical technique

- Ventral midline incision
- Cranial sternotomy
- Resection of the segment
 - Incision in elastic tissue
 - Endotracheal tube

Tracheal resection anastomosis

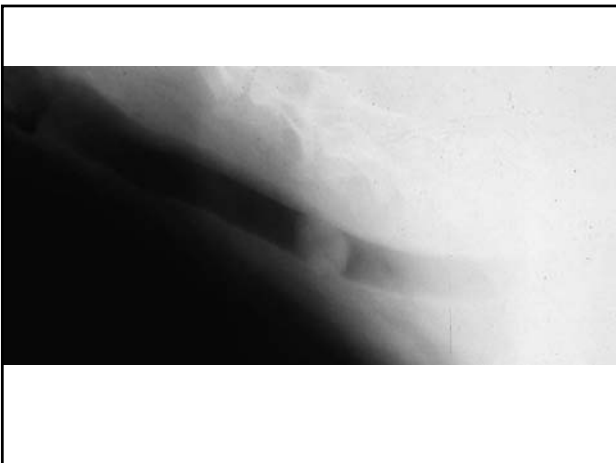
Surgical technique

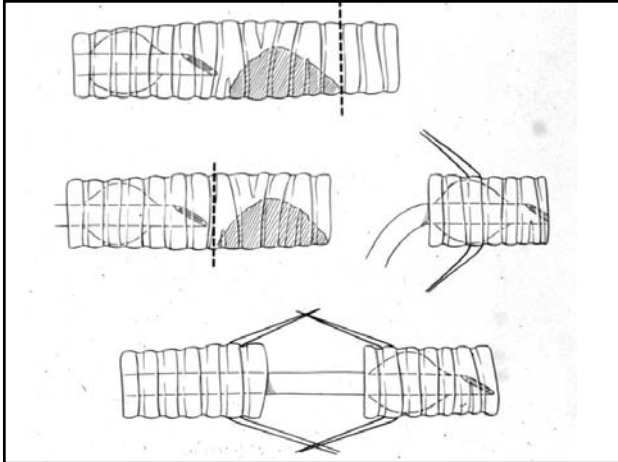
- Simple interrupted monofilament
 - Connective tissue or elastic ligament between rings
- Secondary tension sutures

Tracheal resection anastomosis

Surgical technique

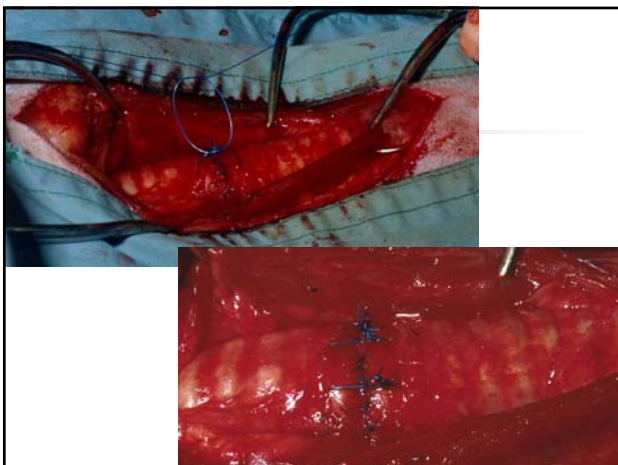
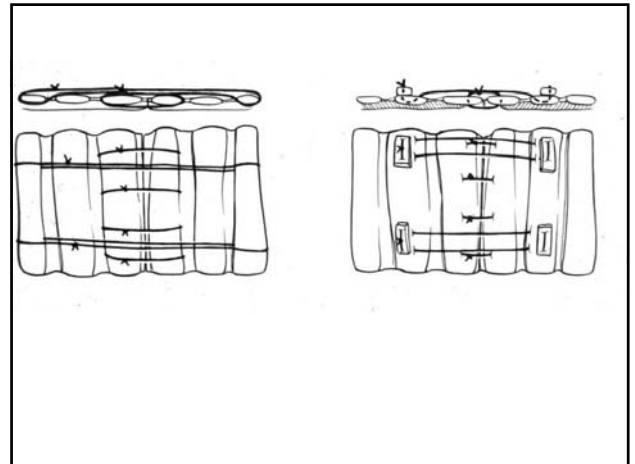
- Resection of the segment
 - Split cartilage technique: better outcome (Hedlund, vet surg)
 - Less overlapping
 - Less stenosis
 - Less soft tissue protrusion
 - Incision in elastic tissue
 - Endotracheal tube

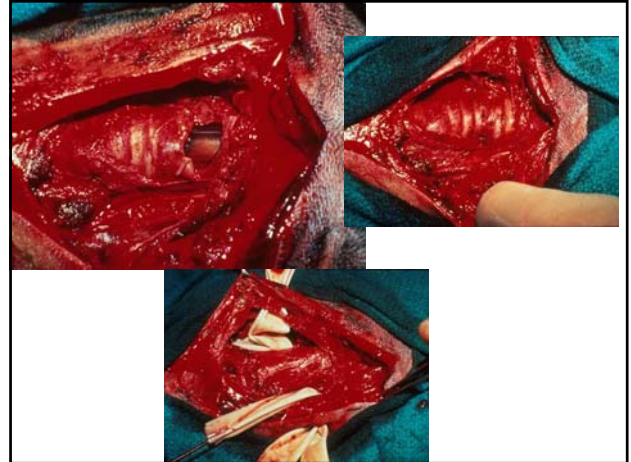




Tracheal resection anastomosis Surgical technique

- Simple interrupted monofilament
 - Connective tissue or elastic ligament between rings
- Secondary tension sutures





Collapsing trachea

- Congenital in young animal
- Primary
- Cervical trachea
- Static or Dynamic

Collapsing trachea

- Acquired condition
- Secondary
 - Upper airway obstruction
 - Chronic active bronchitis
 - Reactive small airway disease
 - Mitral regurgitation
- Thoracic trachea
- Dynamic



Collapsing trachea

Medical treatment

- Transtracheal wash
- Culture sensitivity
 - Mycoplasma
- Bronchodilator
- Cough suppression
- Antibiotic
- Anti-inflammatory drugs

Collapsing trachea

Surgical treatment

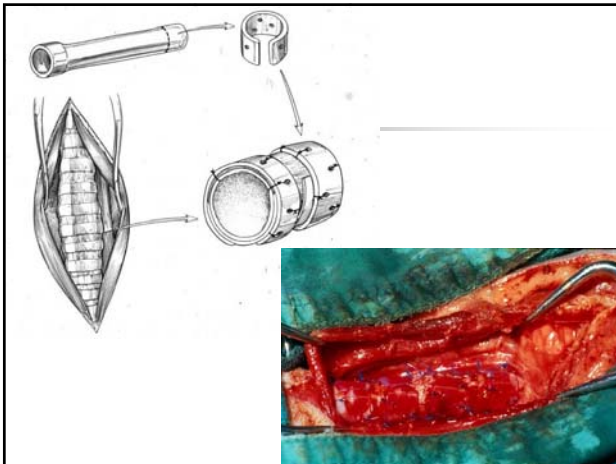
Grade IV

- Exhausted medical treatment
- Ring prosthesis
 - Syringe case from a 3ml syringe
 - C Shaped ring facing ventrally
 - Dorsal membrane sutured
 - several rings 7 to 10 mm apart

Collapsing trachea

Surgical treatment

- Dissection of recurrent laryngeal nerve
- Segmental blood supply



Collapsing trachea

Surgical treatment

Endotracheal Stent

- Auto-expandable
 - Nitinol
- Torsion
- Migration
- Inflammation

