

# STOMACH AND ABOMASUM

## ■ Postmortem changes

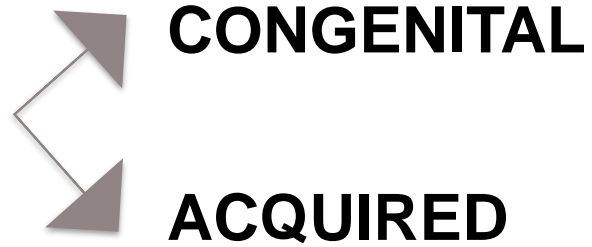
- \* Rigor mortis
- \* Hypostasis
- \* Sulfmethemoglobin
- \* Bile agent
- \* Gastromalasia

## ■ Foreign bodies

- ❖ Foreign bodies in distemper and rabies - dogs
- ❖ Trichobezoars - long haired cats
- ❖ Phytobezoars and trichophytobezoars - calves reared on diets low in roughage



# PYLORIC STENOSIS



- It is relatively common **in dogs**, and rare in cats and horses.
- Recurrent vomiting and poor growth in recently weaned animals suggest the clinical diagnosis of a congenital lesion.



# CONGENITAL PYLORIC STENOSIS

- In some dogs there may be hypertrophy of pyloric smooth muscle, which appears grossly thickened.
- *Tonic stenosis of the pyloric sphincter* may occur in dogs
  - ☑ perhaps because of alterations of the myenteric plexus or
  - ☑ Gastrin excess



# ACQUIRED PYLORIC STENOSIS

## Functional:

- Abomasal hypomotility
- Physical causes of acquired pyloric stenosis or obstruction include:
  - Ulceration and stricture of the pyloric canal in any species
  - Complication of polyps and tumors
  - **Chronic hypertrophic pyloric gastropathy in dogs** is the term coined for a syndrome of pyloric obstruction in dogs, associated with *mucosal hypertrophy, hypertrophy of circular smooth muscle, or a combination of the two.*

**Chronic hypertrophic pyloric gastropathy**



# GASTRIC DILATION AND DISPLACEMENT

## GASTRIC DILATATION in the **HORSE**

**Primary** *gastric dilation* in horses happens due to

- Consumption of excess fermentable carbohydrate
- Lush pasture or
- Excessive intake of water.

**Secondary** (more frequent) Gastric dilation in the horse is often

- Obstruction of stomach, small bowel, or of colic with ileus
- Grass sickness
- Ingestion of *Datura sp.* Seeds, which contain a parasympatholytic alkaloid, can also cause ileus, leading to gastric dilation.



# GASTRIC DILATATION IN THE DOG

- Commonly **in dogs**
- Gastric dilation and volvulus are usually problems associated with **overeating**, and **probably aerophagia**,
- Especially in the ***deep-chested breeds***, such as **Great Danes, St. Bernards, Irish Setters**.
- The gas that contributes to the development of dilation is probably the result of **aerophagia**, **and possibly the evolution of carbon dioxide by physiologic mechanisms**.
- **Inability to relieve the accumulation of food, fluid, and gas** in the stomach causes the organ to dilate and change **its intra-abdominal position**, so that **its long axis rotates from a transverse left-right orientation to one paralleling that of the abdomen**.



## Appearance of Volvulus

It rotates on the **mesenteric axis clockwise** resulting in a gastric volvulus with an **obstructed esophagus** that prevents eructation and thus further contributes to gastric dilation

**The spleen**, attached to the stomach by the gastrosplenic ligament, **rotates with the stomach** and is thus folded back upon itself and located in the right cranial abdomen against the diaphragm.

The splenic vein is compressed, resulting in a **congested spleen**, because the arterial blood supply remains patent longer than venous drainage.



## Appearance of Volvulus

- **Venous infarction** of the gastric mucosa ensues
- The gastric wall are **edematous and dark red to black**
- **Bloody content in the lumen** of the stomach
- **Necrosis of ischemic mucosa** occurs, and the stomach may rupture.
- **Hemoperitoneum**





# RESULTS OF VOLVULUS

- ✓ Obstruction of veins by volvulus and pressure exerted by the distended stomach result in decreased return via the portal vein and posterior vena cava, causing **reduced cardiac output** and **circulatory shock**.
- ✓ Increased intra-abdominal pressure affects on the **diaphragm** and **compromises respiration**.
- ✓ **Death** is inevitable in dogs not treated early.



# ABOMASAL DISPLACEMENT

## ■ Causes:

\* **High-producing, intensively managed, dairy cattle**

\* **Abomasal atony**

\* **Increased gas production**

(Influx of high concentrations of volatile fatty acids from the rumen and hypocalcemia may play a part in instigating hypomotility while evolution of gas in the abomasum is directly related to the amount of concentrate in the ration.)

\* **Postpartum**



# GASTRIC IMPACTION

## Horse

- Fibrous roughage and persimmons
- Inadequate water intake
- Poor mastication

## Clinically

- ✓ Anorexia
- ✓ Mild colic
- ✓ Loss of body condition

## Cattle

### Primary:

Restricted water intake and coarse  
High roughage feed  
Enceinte

### Secondary:

- ✓ Pyloric stenosis (physical or functional)
- ✓ Vagus indigestion
- ✓ Adhesions of the abomasum and omasum
- ✓ Systemic diseases that causes abomasal stasis



# RESULTS OF GASTRIC IMPACTION

- Peritonitis
- The laceration is near the omasal-abomasal orifice
- Compression necrosis
- Omasal dilation and ruminal distension



# CIRCULATORY DISTURBANCES

## Active hyperemia

- \* Physiologic
- \* Chemical substance
- \* Acute gastritis

## Passive hyperemia

- ❖ Portal hypertension
- ❖ Cirrhosis
- ❖ Shock



# Haemorrhage

- ❖ Congestion
- ❖ Infectious diseases
- ❖ Stress

# Venous infarction

**Gastric venous infarction** is related to endothelial damage and thrombosis in venules, usually associated with

- ❖ Endotoxemia
- ❖ Bacterial or toxic damage
- ❖ Salmonellosis
- ❖ *E. coli* septicemia
- ❖ **Gastric venous infarction is a common lesion in swine and seen in swine**
  - Coliform gastroenteritis
  - Erysipelas
  - Dysentery
  - Glasser's disease
  - Hog cholera



# EDEMA

**Edema of the gastric mucosa occurs with**

- **Hypoproteinemia**
- **Portal hypertension**
- **Cattle poisoned by arsenic**
- **Gut edema of swine**



# GASTRITIS

☑ Chemical gastritis (abomasitis)

☑ Uremic gastritis

☑ Braxy (bradsot)

☑ Chronic gastritis

☑ *Helicobacter* gastritis

☑ Chronic atrophic gastritis

\* Chronic diffuse gastritis

\* Chronic antritis





## Dogs

- ✓ Chronic hypertrophic gastritis
- ✓ Chronic hypertrophic pyloric gastropathy
- ✓ Hypertrophic antritis
- ✓ Eosinophilic gastroenteritis
- ✓ Mycotic gastritis
- ✓ Mycotic abomasitis
- ✓ Abomasitis associated with viral infection



# CHEMICAL GASTRITIS

- Chemical gastritis or abomasitis, reflected in
  - diffuse gastric congestion,
  - hemorrhage,
  - necrosis,
  - ulceration

It may be induced by chemicals such as arsenic, thallium, formalin, bronopol, steroidal and nonsteroidal anti-inflammatory drugs (NSAIDs), phosphatic fertilizers, and by the toxic principle in bitterweed



# BRADSOT

- An acute abomasitis of **sheep** and, less commonly, calves,
  - caused by infection with ***Clostridium septicum***.
  - *It occurs in cold areas and in winter.*
  - The entry of the agent into the mucosa may be due to the **ingestion of frozen grass and feed**.
  - Cold weather is usually associated with the disease,
  - Production of **exotoxin by *C. septicum*** causes the signs and death **quickly**.






# BRADSOT

- At necropsy, there may be **Blood-tinged abdominal fluid**
- The serosa of the Abomasum may be **congested** or **fibrincovered**.
- Mucosal lesions may be diffuse or demarcated foci of variable size and shape
- Abomasal folds may be thickened, **reddened, and occasionally hemorrhagic or necrotic**.
- Most notable is the presence of **extensive gelatinous edema and emphysema in the submucosa**.
- **Gram-positive bacilli** are usually evident as individuals or colonies in affected tissue.



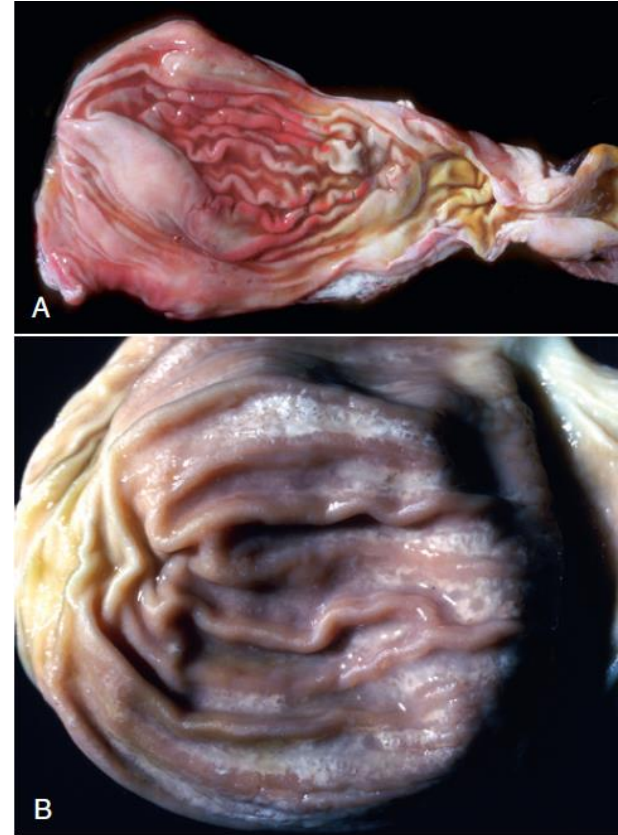
# UREMIC GASTRITIS

- It is **caused by uremia**. Uremia occurs due to the renal failure.
- Uremia means **high level of urea in the blood**. It make vasculitis. Vasculitis leads to both **gastritis and stomatitis**.
- By the time urea converts to amonia by the bacterial flora of the mounth. Also it makes stomatitis.
  - Urea  amonnia
  - At the same time, Metabolism of calcium disturbance leads mineralizaiton in gastric.
  - Gastrin increases in blood because of kidney failure.
  - Gastrin  Acidity  Gastritis
  - Also, gastrin hormon increase and then acidity increase and make gastritis.



# UREMIC GASTRITIS

- Result of **chronic renal disease**
- **Congestion and edema** of the gastric mucosa caused by **injury to capillaries** within the lamina propria associated with elevated concentrations of **nitrogen-derived** metabolic waste products in the systemic circulation from kidney failure. (Fig. A)
- **Mineralization** of the glands, vessels, and lamina propria of the gastric mucosa (grossly visible as fine white stippling and lines in the mucosa (Fig. B)).
- Ulcer formation.




# GASTRODUODENAL ULCERATION

## *The pathogenesis of peptic ulcer*

(imbalance between the necrotizing effects of gastric acid and pepsin)

## HYPERSECRETION OF ACID

- Gastrin    
- Gastrinomas (Zollinger-Ellison Syndrome)
- Mastocytoma                      **Increased histamine**
- Mastocytosis                        **levels**



# ULCERATION DUE TO COMPROMISE OF MUCOSAL PROTECTIVE MECHANISMS

- Nonsteroidal antiinflammatory agents (Aspirin, phenylbutazone, indomethacin)
  - Direct toxic effect
  - Suppression of prostaglandin synthesis
- *Helicobacter pylori* (in humans)
- Reflux of duodenal contents (containing bile salts)
- Glucocorticoids
- Stress
  - Reduced mucosal perfusion
  - Ischemia





# THE CAUSES OF ULCERS

## DOG

- ✓ Mastocytoma
- ✓ Mastocytosis
- ✓ Zollinger-Ellison Syndrome
- ✓ Administration of glucocorticoids and non-steroidal antiinflammatory drugs in high doses
- ✓ Trauma
- ✓ Surgery
- ✓ Damage to the spinal cord



# CATTLE

☒ **In veal calves, dairy cattle, feeding cattle**

× **Stressful circumstances**

× **Weaned and veal calves**

× **Postparturient cows**

☒ **Abomasal displacement**

☒ **Mastitis**

☒ **Transportation**

☒ **High concentrate rations**

☒ **Lymphosarcoma**

☒ **Arsenic poisoning**

☒ **Rinderpest, Malignant catarrhal fever**

☒ **Mucosal disease, Theileriosis**



# HORSE

✿ Different diseases

✿ Intestinal diseases

✿ Colic

✿ Surgery

✕ Stressful circumstances

✿ *Candida* spp.

✿ *Clostridium botulinum* type B

✿ *Clostridium perfringens*



# PARASITIC DISEASES OF STOMACH AND ABOMASUM HORSE

📌 *Gasterophilus intestinalis*

📌 *G. nasalis*

📌 *G. haemorrhoidalis*

📌 *G. pecorum*

📌 *G. inermis*

📌 *G. nigricornis*

GASTEROPHILOSIS

📌 *Habronema musca*

📌 *H. microstoma* (*H. Majus*)

HABRONEMIASIS

📌 *Draschia megastoma* (Nodule)

📌 *Trichostongylus axei*



# DOG-CAT

- *Gnasthostoma spinigerum* (NODULE)
- *Physaloptera preputialis*
- *P. rara*
- *P. canis*
- *Cyathospirura*
- *Cylicospirura felineus* (NODULE)
- *Ollulanus tricuspis*
- *Capillaria putorii*
- *Cryptosporidium*



# CATTLE-SHEEP-GOAT

- *Ostertagia ostertagi*- cattle
- *O. circumcinctata*
- *O. trifurcata*
- *O. lyrata* – cattle
- *O. leptospicularis* – cattle-sheep-goat
- *Haemonchus contortus* – sheep-goat
- *H. placei* ---cattle
- *Marshallagia marshalli*
- *Mecistocirrus digitatus*
- *Camelostrongylus mentulatus*
- *Trichostrongylus axei* (Nodule)
- *Cryptosporidium*

OSTERTAGIOSIS  
(NODULE)

HAEMONCHOSIS



# GASTRIC NEOPLASIA

- **Dog**

- \* Adenocarcinoma

- **Cat**

- \* Adenocarcinoma

- \* Lymphoma

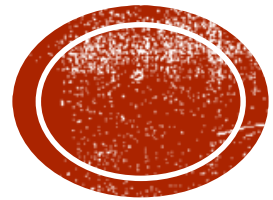
- **Horse**

- \* Squamous cell carcinoma

- **Cattle**

- \* Lymphoma





**INTESTINE**



# CONGENITAL ANOMALIES of the INTESTINE I

- **Segmental Anomalies**
- **Stenosis** (*incomplete occlusion or narrowing of the lumen*)
  - **Atresia** (*complete occlusion of the lumen*)
    - ✓ Atresia coli
    - ✓ Atresia ilei
    - ✓ Atresia jejuni
    - ✓ Atresia ani
    - ✓ Atresia ani and recti

**Atresia coli and Atresia ani are the most common anomaly**

*Atresia coli* is seen particularly in *the spiral colon* of Holstein calves, and in the large and small colon of Foals  
**While Atresia ani** is most often encountered in calves and pigs, in which it is considered to be hereditary.



## CONGENITAL ANOMALIES of the INTESTINE II

- Short colon (cats and dogs)
- Hypoplasia of the small intestine (foals)
- Congenital colonic agangliosis (foals)
- **Persistent Meckel's diverticulum (swine and horses)**
- Intestinal diverticula



# PERSISTENT MECKEL'S DIVERTICULUM

- Occurs anomaly mostly along the **antimesenteric border of the lower small bowel.**
- Mainly in **swine and horses.**
- Derived from the omphalomesenteric (vitelline) duct, which is the stalk of the yolk sac.
- The vitelline membrane can also persist forming a **fibrous ligament or *mesodiverticular band* between the distal small jejunum and the diverticulum or umbilicus.**

In summary, the duct fails to regress and involute, which remains as a remnant of variable length and location



# MISCELLANEOUS CONDITIONS OF THE INTESTINAL TRACT

- Intestinal Lipofuscinosis
- Muscular hypertrophy of the ileum (swine and horses)
- Diverticulosis of the small intestine
- Intestinal emphysema in pigs
- Rectal prolapse (swine, sheep and cattle)



# INTESTINAL OBSTRUCTION

- Intestinal obstruction may be the sequel to a physical blockage of the lumen resulting from **stenosis** (narrowing, stricture) caused by an **intrinsic lesion** *involving the intestinal wall*, **obturation (occlusion)** by an intraluminal mass, or **extrinsic compression**.

FUNCTIONAL OBSTRUCTION



# 1. STENOSIS AND OBTURATION

## ❖ Segmental congenital anomalies of the intestine (stenosis and atresia)

- Acquired stenosis (intramural abscesses, primary neoplasms and scarring following ulceration)
- Foreign bodies
- Enteroliths\*, phytobezoars\*, trichobezoars\*
- Parasites
- Impaction of the colon, by feces in dogs and cats
- Impaction of the ileum , by feces in horses
- Impaction of the cecum or colon in horses
- Gravel



**Enteroliths** (mineral concretions) were common in the colon of horses.

Mineral salts are deposited in **concentric lamellae** around a central *nidus*—a foreign body such as a nail, wire, stone, or particle of feed

**Phytobezoars** or fiber balls consist largely of **plant fibers intermixed with phosphate salts**, may be found especially in the colon of horses

**Hairballs (trichobezoars)** sometimes occur **in dogs, cats, and ruminants**; in ruminants they occur mostly in the forestomachs.



## 2. EXTRINSIC OBSTRUCTION

- **TUMORS** involve the intestine can make obstruction from outside the lumen, for example a tumor of pancreas.
- **ADHESIONS** are also common reason that make obstruction. In these situation, obstruction develops gradually as fibrous tissue contracts and adheres the bowel to itself or other abdominal structures.
- **ABDOMINAL FAT NECROSIS**
- **PEDICLES OF SOME TUMORS**
- **INCARCERATION IN HERNIAS**





### 3. FUNCTIONAL OBSTRUCTION

Failure of the intestinal circular smooth muscle to contract blocks the peristaltic wave, causing **functional obstruction**, a clinical syndrome of **pseudoobstruction** in which there is no physical occlusion of the lumen of the impacted intestine.

- **Paralytic ileus** frequently follows abdominal surgery, especially when the intestines are handled roughly or traumatized. It also is associated with peritoneal irritation of any cause, especially peritonitis. **Intestinal paralysis resulting from complete obstruction of the intestines** is called **ileus**.
- **Pseudo-obstruction (neuromuscular dysfunction)** a clinical syndrome described mostly in dogs, in which there is **no physical occlusion of the lumen of an impacted intestine**, may result from **segmental or diffuse neuromuscular dysfunction in the gut**.
- **Ganglioneuritis or neuronal hypocellularity**
- **Megacolon in Clydesdale foals-hypoganglionosis of the myenteric plexus**
- **Grass sickness in horses**
- **Feline dysautonomia or Key-Gaskell syndrome**
- **Intrinsic disease of intestinal smooth muscle (syndrome of intestinal sclerosis)**



# CLINICAL SYMPTOMS AND CIRCUMSTANCES LEADING TO DEATH IN INTESTINAL OBSTRUCTION

- Acute shock
- Endotoxemia
- Dehydration
- Tympany
- Ischemia
- Autointoxication
- Electrolyte imbalance
- Gastric and intestinal rupture
- Disseminated
- Paralytic ileus



# DISPLACEMENTS OF THE INTESTINES

## 1. EVENTRATION

Displacement of a portion of the gut, usually the small intestine, outside the abdominal cavity.

- Congenital
  - Schistosomus reflexus
  - Patent umbilicus
  - Congenital diaphragmatic hernia
- Acquired (trauma)



## 2. CECAL AND COLONIC DILATION, TYMPANY AND TORSION

### ➤ In ruminants, cecal dilation and torsion

- ✓ Occurs in animals fed High-concentrate rations
- ✓ Has been associated Late gestation and ileus from other causes



An increase in the concentration of dissociated volatile fatty acids, especially butyric acid, causes atony of the cecum, and dilation follows.

Motility is reduced.

If physical obstruction and ischemia are seen at the time in intestines then called strangulation obstruction



## ➤ In horses, cecal and colonic tympany

✓ Readily fermentable carbohydrate

### CLINICALLY

- Severe abdominal distension
- Compression of intra-abdominal organs
- Reduced cardiac return due to postcaval compression
- Reduced respiratory capacity due to compression of the diaphragm
- Severe pain
- Hypovolemia, acidosis, large bowel ruptures
- Laminitis (in recovered horses)



### 3. DISPLACEMENTS OF THE EQUINE COLON

- Right dorsal displacement of the colon
- Left dorsal displacement of the colon
- Colonic torsion and volvulus

