

# Colic diagnostics

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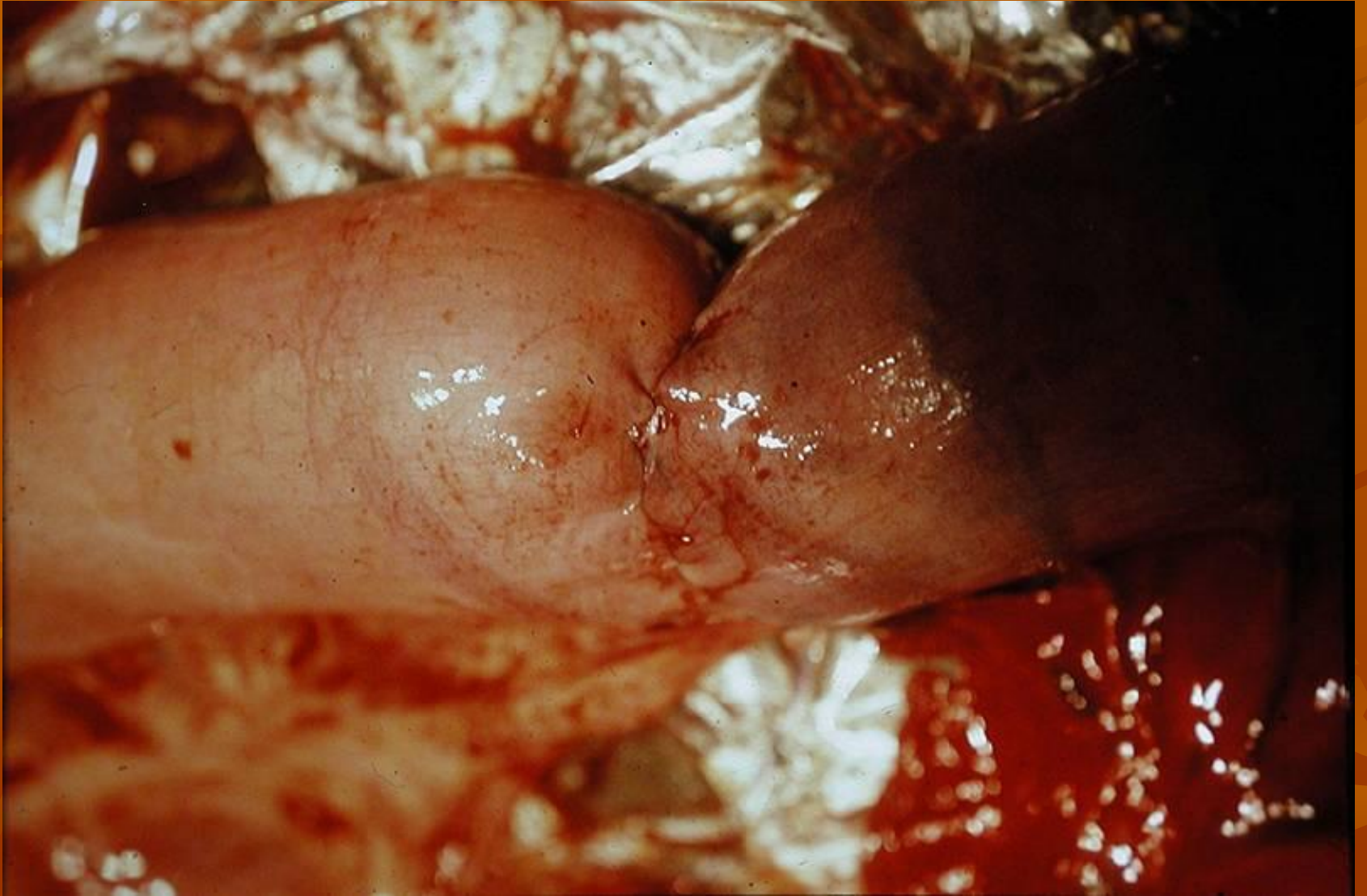
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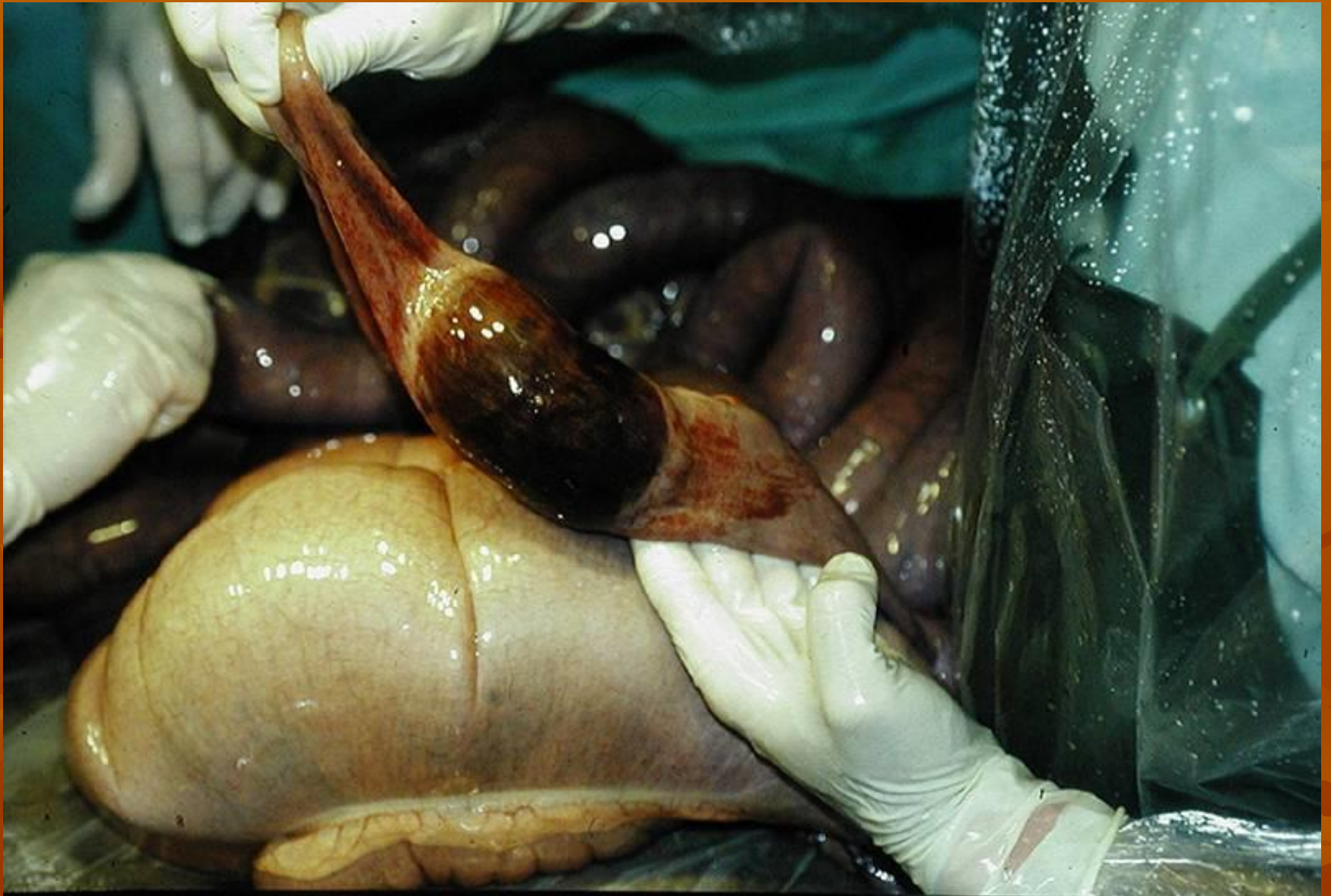
- Colic = abdominal pain
- Ileus: intestinal obstruction and temporary failure of peristalsis
- Prevents aboral movements → stasis + distention
- total/partial
- Rapid and accurate diagnosis!!!
- Broadly classified: physical or functional obstruction

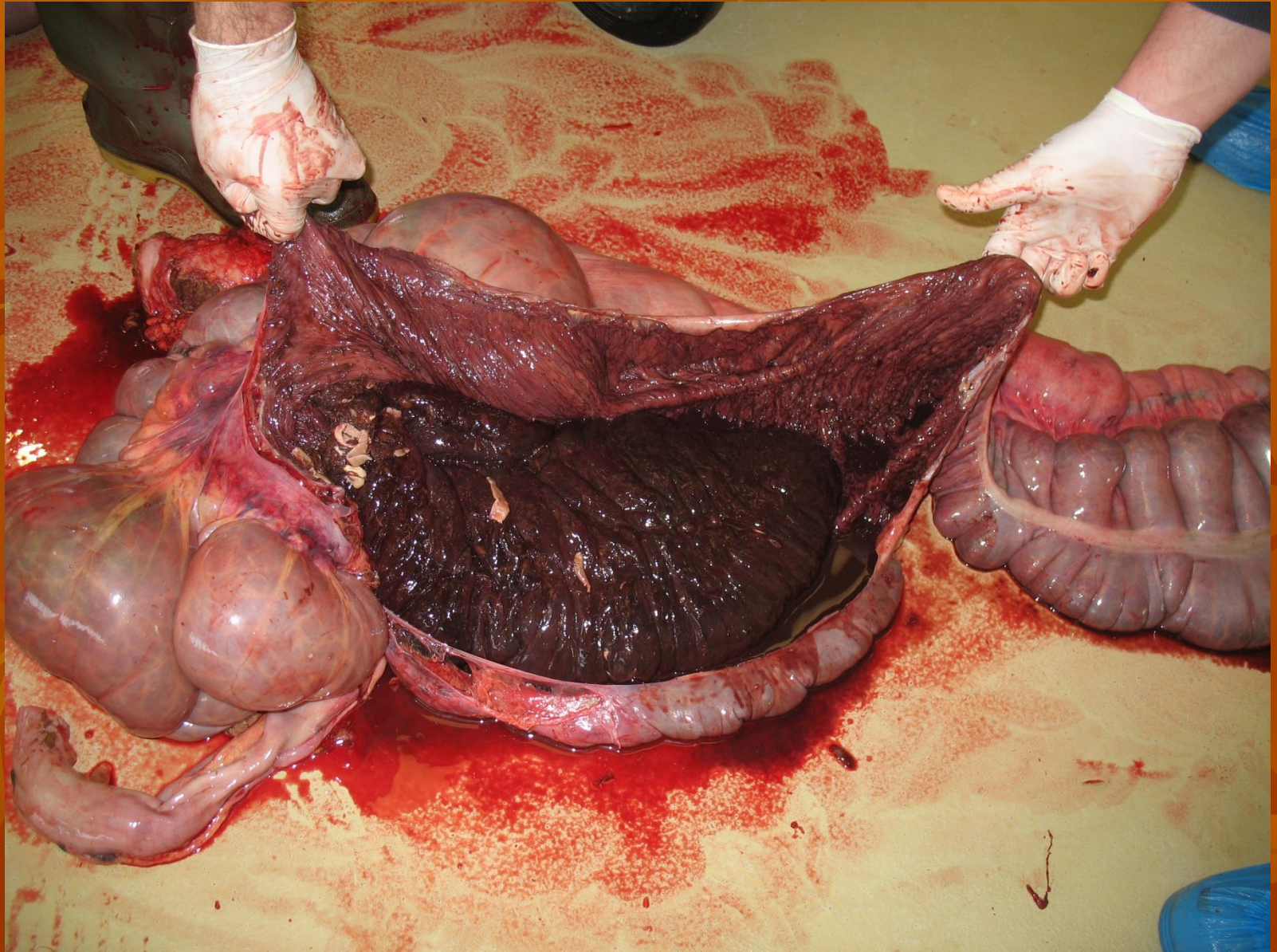
# Classification of ileus (Gerber and Huskamp)

I.







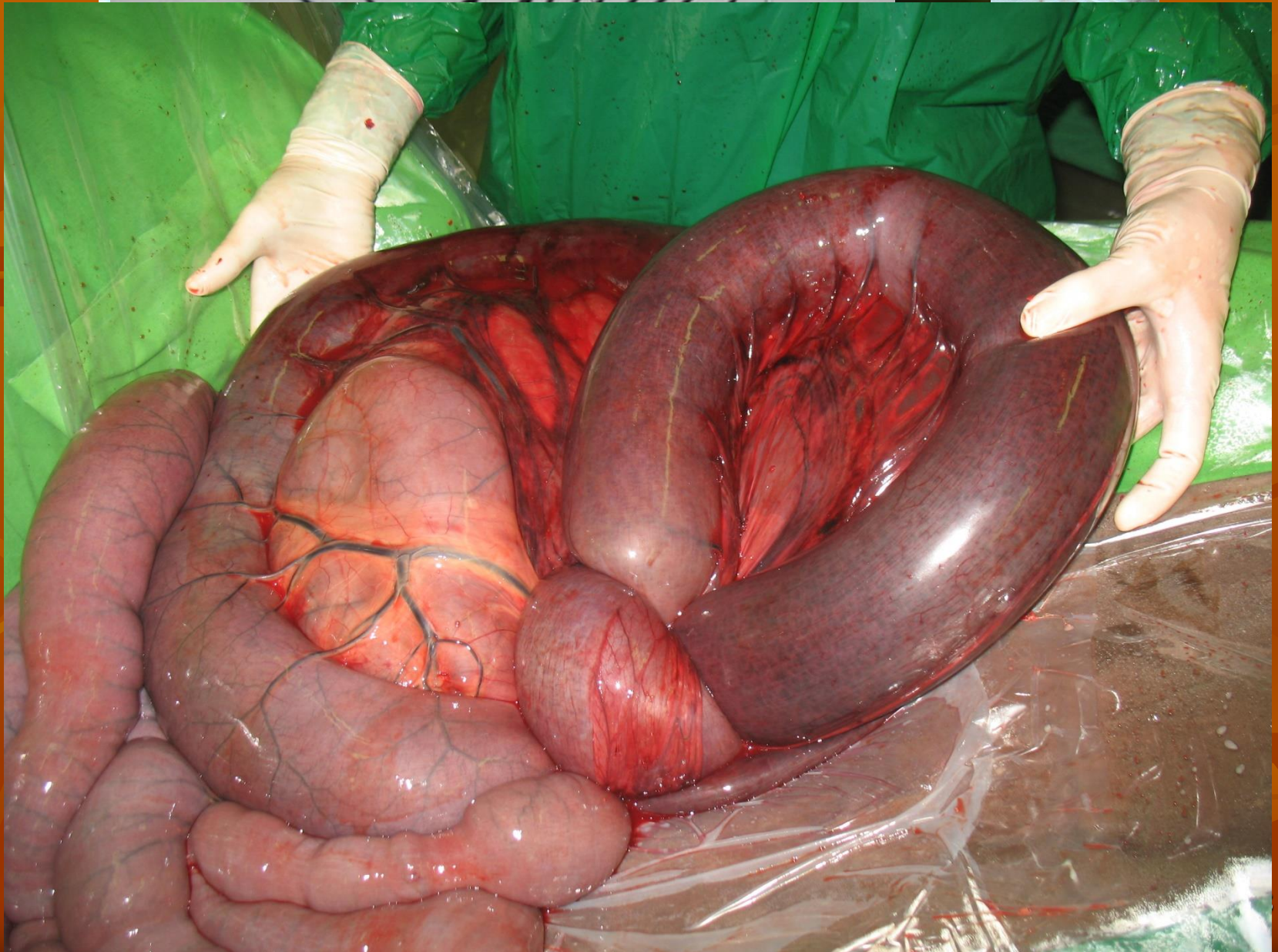




Cl

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Gerber





# Classification according to Gerber



## Physical obstruction

- nonstrangulating – mesenteric blood supply intact but bowel lumen occluded
  - intraluminal reduction / mass
  - intramural thickening or extramural compression
- strangulating – luminal occlusion and reduction of mesenteric blood supply – (incarceration, intussusception, torsion > 180-degree)

# Mechanism

- Obstruction → prevents aboral movements, distention, venous drainage↓, congested- edematic mucosa, >24 hours: irreversible mucosal ischemia



- In strangulating obstruction:  
rapid tissue hypoxemia (4-6h),  
ischemia, necrosis (rupture), transmural leakage,  
endotoxemia, hypovolemia

# How to get rapid and accurate diagnosis?

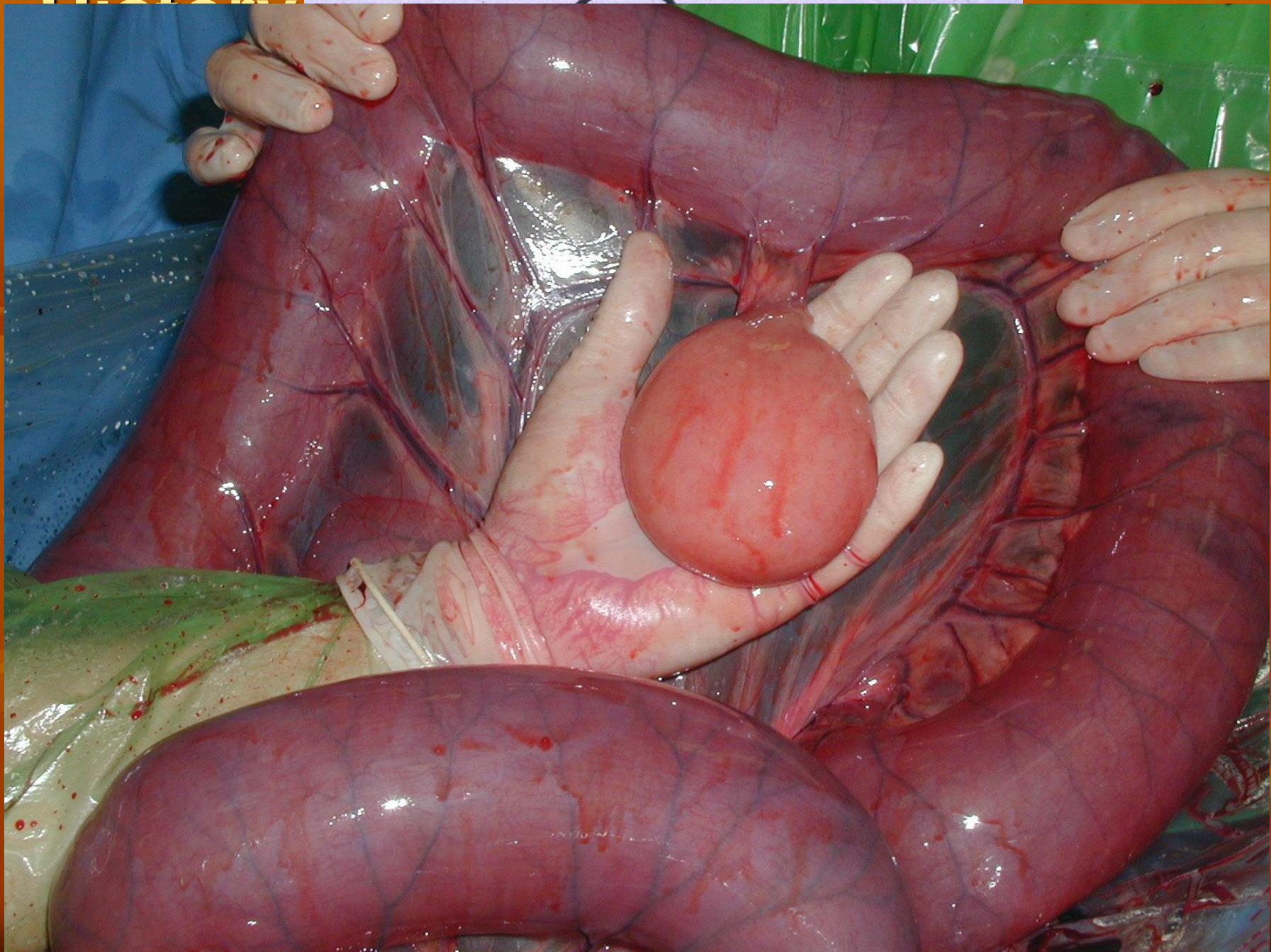
1. History
2. Clinical observation and signs of pain
3. Physical examination
4. Nasogastric intubation
5. Rectal examination
6. Ultrasonography
7. Abdominocentesis

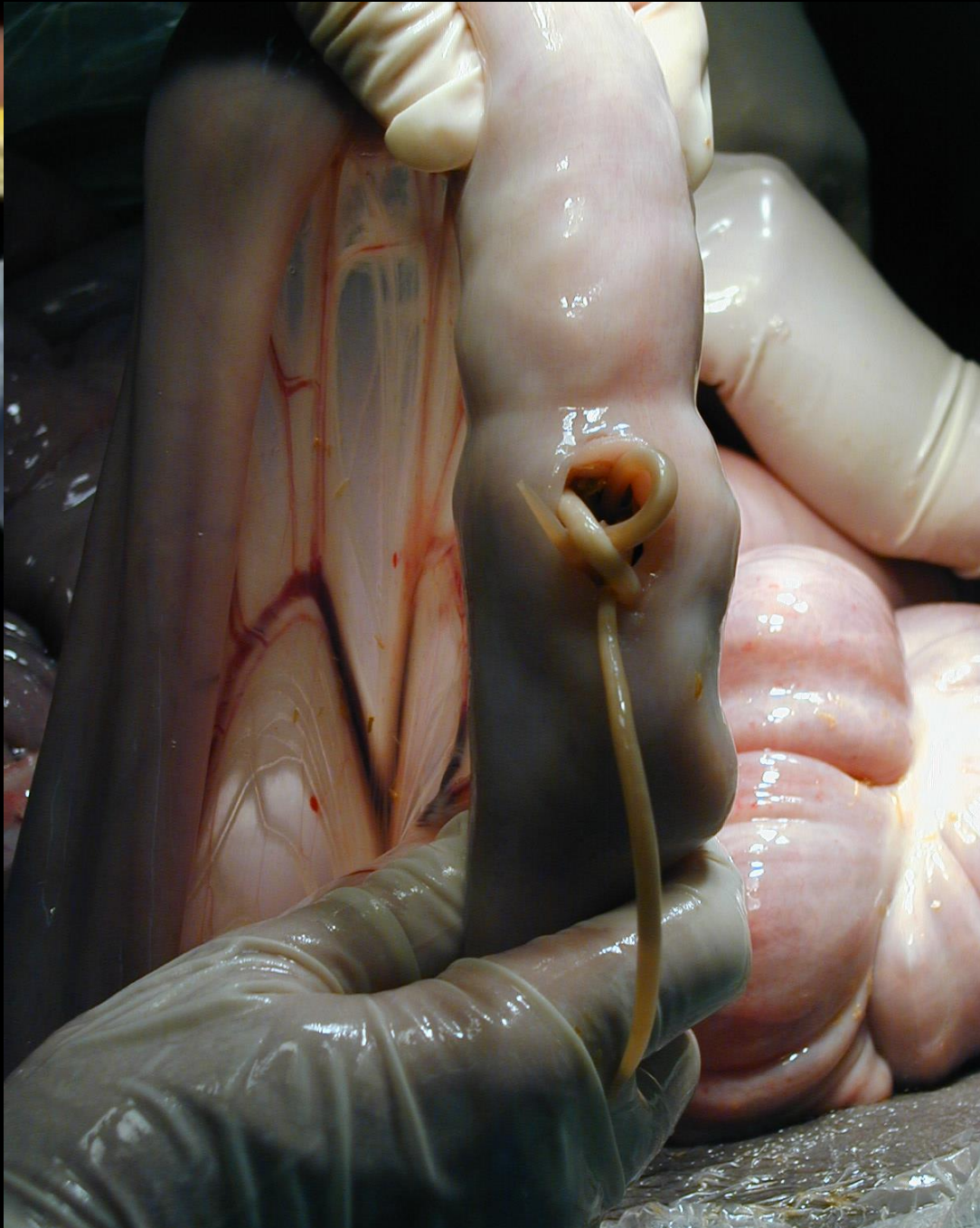
The order can be changed if indicated.

# Diagnosis

## 1. History

- Management
  - changes of diet
  - consumption of water
  - exercise level
  - stabling changes
  - dentistry
  - pregnancy







# 1. History

- Medical

- any links to this episode of colic (deworming, NSAID-gastric ulcer, right dorsal colitis)
- repetitive colic:
  - previous abdom. surg.?
  - adhesions
  - enteroliths
  - ingestion of sand
  - linear foreign body

## 2. Clinical observation and signs of pain

Pain correlates with the severity of colic  
restlessness, sweating, scratching,  
rolling, strange position, watching the  
flank region, kicking to abdomen,  
(apathetic-indifferent)

P $\uparrow$ , ABP $\uparrow$ , dyspnoea, mydriasis, lack of  
appetite, muscle fasciculation, shock  
(pain, hypovolaemia, endotoxaemia)



# Clinical observation (attitude)



# Grading system for colic

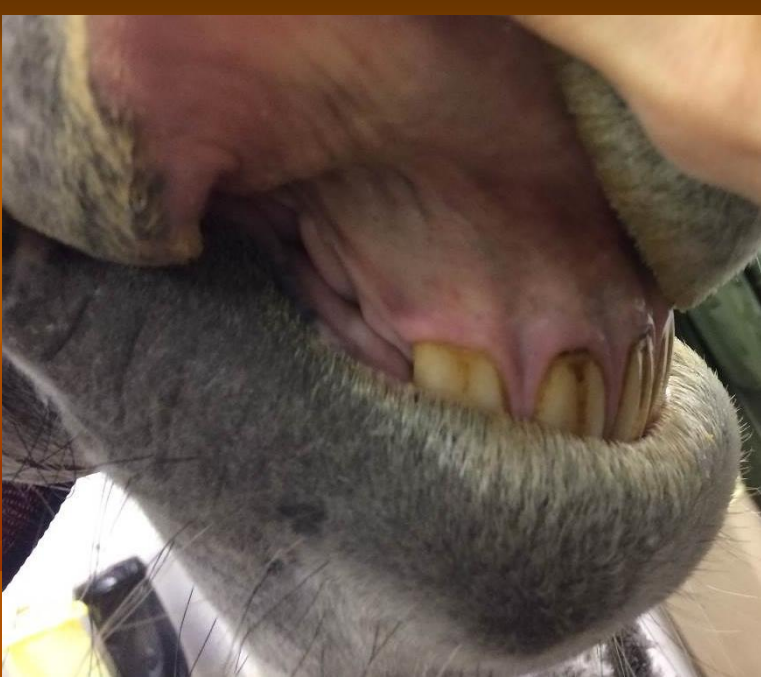
- 1. mild discomfort (gastric ulcer)
- 2. getting up and down, looking at the abdomen (obstipation)
- 3. sweating, rolling (LDD)
- 4. not controlable horse because of pain (torsion of large colon)
- 5. apathy (foramen epiploicum hernia indolent phase)

### 3. Physical examination

(Know normal range of clinical data!!)

Check cardiovascular+GI tract!!!

- T: 37,5-38,0°C ( $\leftrightarrow$ ,  $\uparrow$ peritonitis, enteritis;  $\downarrow$  severe shock)
- HR: 28-42 /min, pulse quality
- RR: 14-18/min
- Skin turgor, mucous membrane, CRT: 1-2 sec venous refill
- Abdominal shape (distension)
- Abdominal auscultation + percussion
- Check scrotum in stallions!







PCV: 32-42 % ( $\uparrow$  splenic contraction, dehydration)

TPP: 6.0 – 7.5 g/dl ( $\uparrow$  ,  $\downarrow$  prot. loss into the lumen or peritoneal cavity)

Bloodgas analysis: **art. blood**

pH: 7.35 - 7.45 (acidemia)

PaO<sub>2</sub> (Hgmm): 80 - 112

PaCO<sub>2</sub> (Hgmm): 36 – 46 (hypercapnia)

HCO<sub>3</sub> (mEq/l) : 22 – 29 (base deficit)

Base excess: -1.7 - +3.9

■Electrolite determination

## 4. Nasogastric intubation



stension

ent

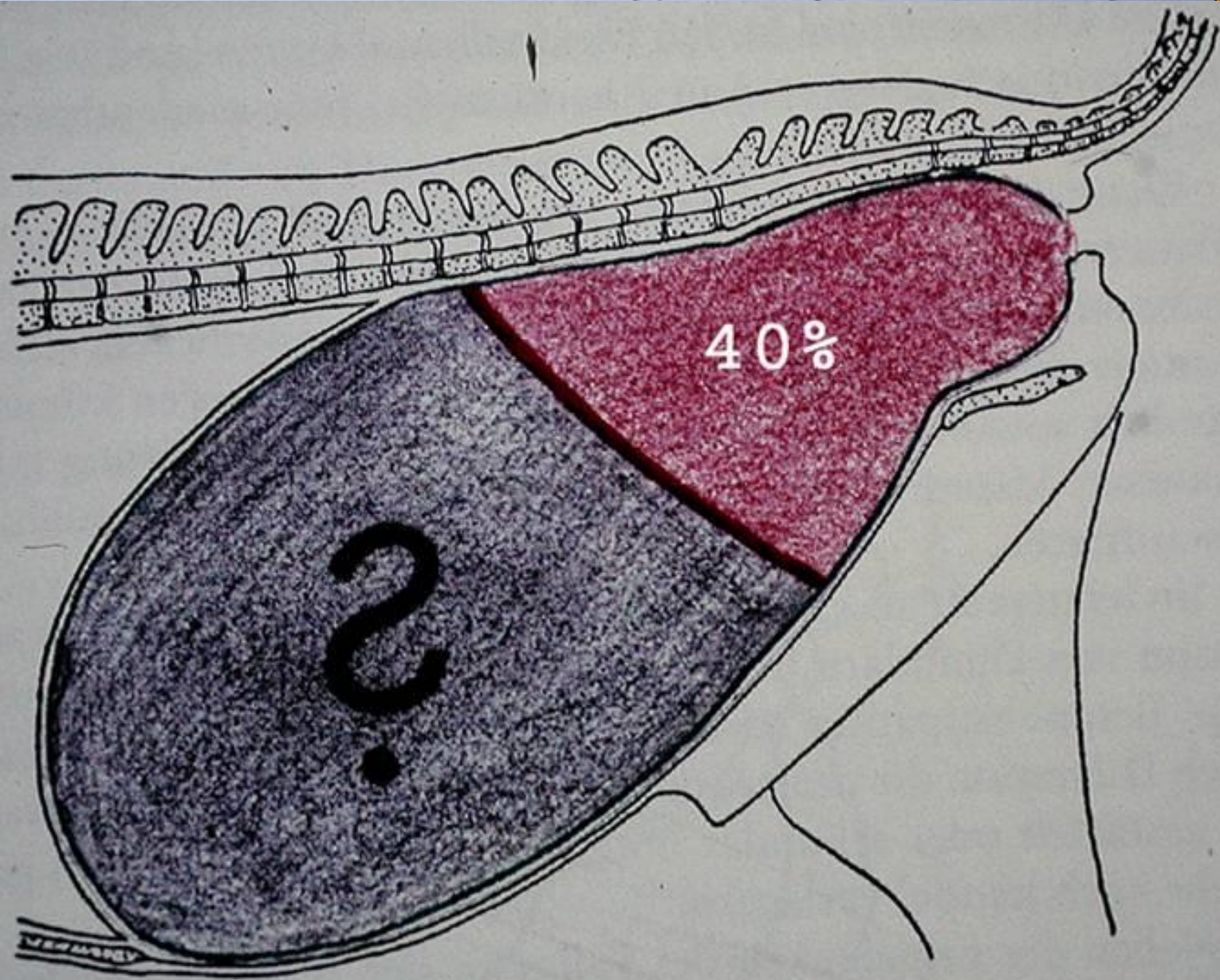
# 5. Rectal examination

## General statements

Always should be done (pony, foal→US!)  
Before paracentesis  
May be an indication for surgery

## Technique

Sedatives+spasmolytic iv.  
Twitch, in stocks, be careful!  
Lubrication  
Mucosa: lesions, blood  
As deep as possible



## 5. Rectal examination

systematic examination!

Palpable intraabdominal structures:

- caudal border of the spleen
- nephrosplenic ligament
- caudal pole of the left kidney
- mesenteric root
- ventral cecal band
- cecal base (head) ±
- small colon containing distinct fecal balls
- pelvic flexure (±)
- examine: internal inguinal rings, bladder, reproductive tract



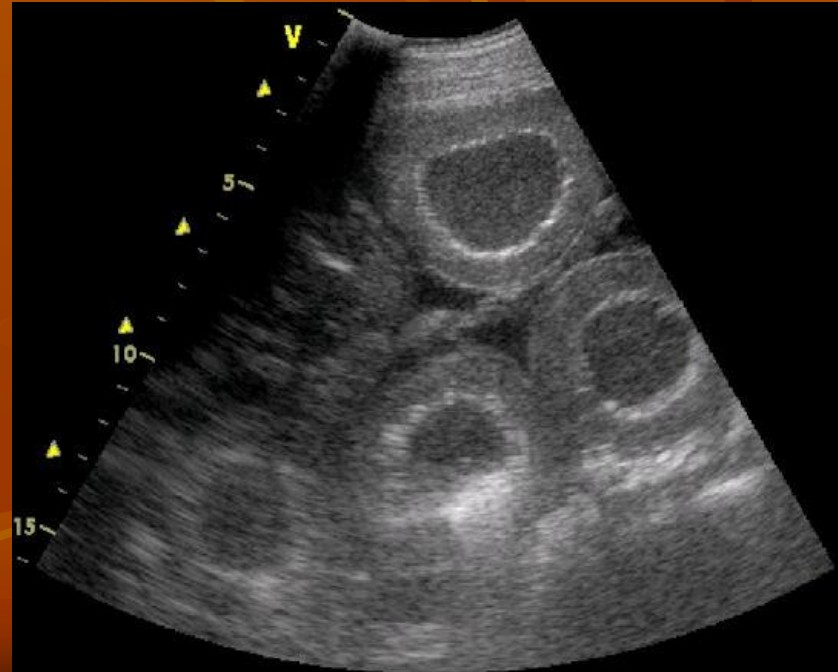
## Abnormal rectal findings:

- distended bowels
- marked intramural/mesenteric edema
- bowel malposition, displacement
- herniation
- impaction
- intussusception
- intraabdominal space-occupying mass  
(abscess/hematoma/tumor)
- enterolith
- volvulus of the mesenteric root, urogenital abnormality
- free abdominal gas/ingesta (visc. rupture)

## 6. Ultrasonography

From diaphragmatic reflection down to the ventral midline

- 2-3,5 MHz
- Gastric distention, right 8-15 ICS
- Small intestine: movements, thickness <3mm
- *Intussusceptions*, inguinal hernia
- Caecum lesions
- Large colon: <5mm



## 6. Ultrasonography

- Intraabdominal fluid
- Foal: instead of rectal exam
- By rectal tears
- Control peristalsis
- Thickness of intestinal wall (hypertrophy-oedem)
- Intestinal content (gas, fluid, sand)
- Incarceration (oedem+fluid in the lumen)
- Invagination (snail-like pattern)



## 7. Abdominocentesis

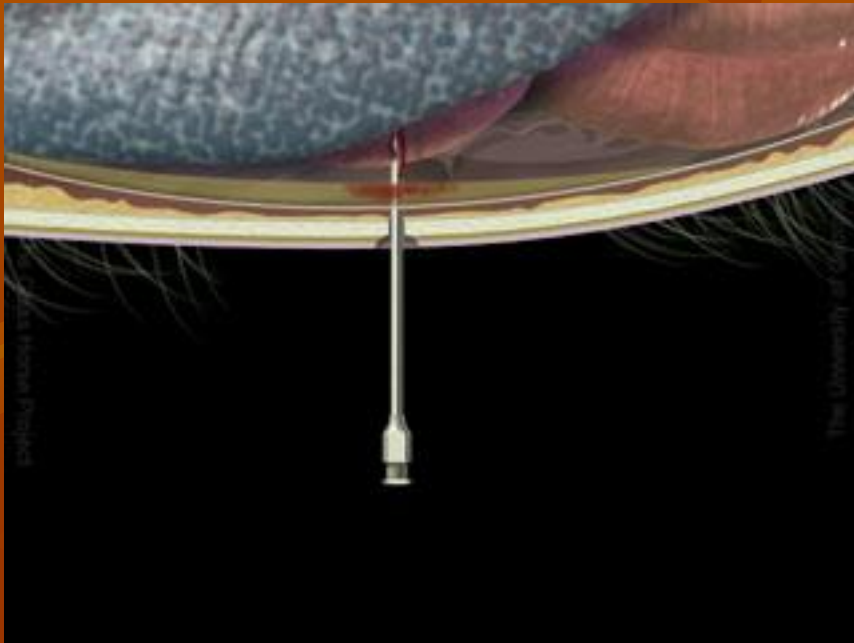
Most dependent part

18G, 7,5 cm, Collect into serum tube – TP

EDTA – cytology, cell count

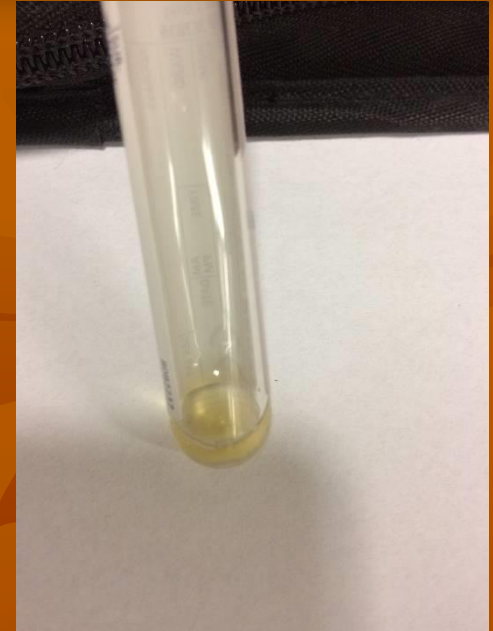
RISK: enterocentesis, spleen, amniocentesis

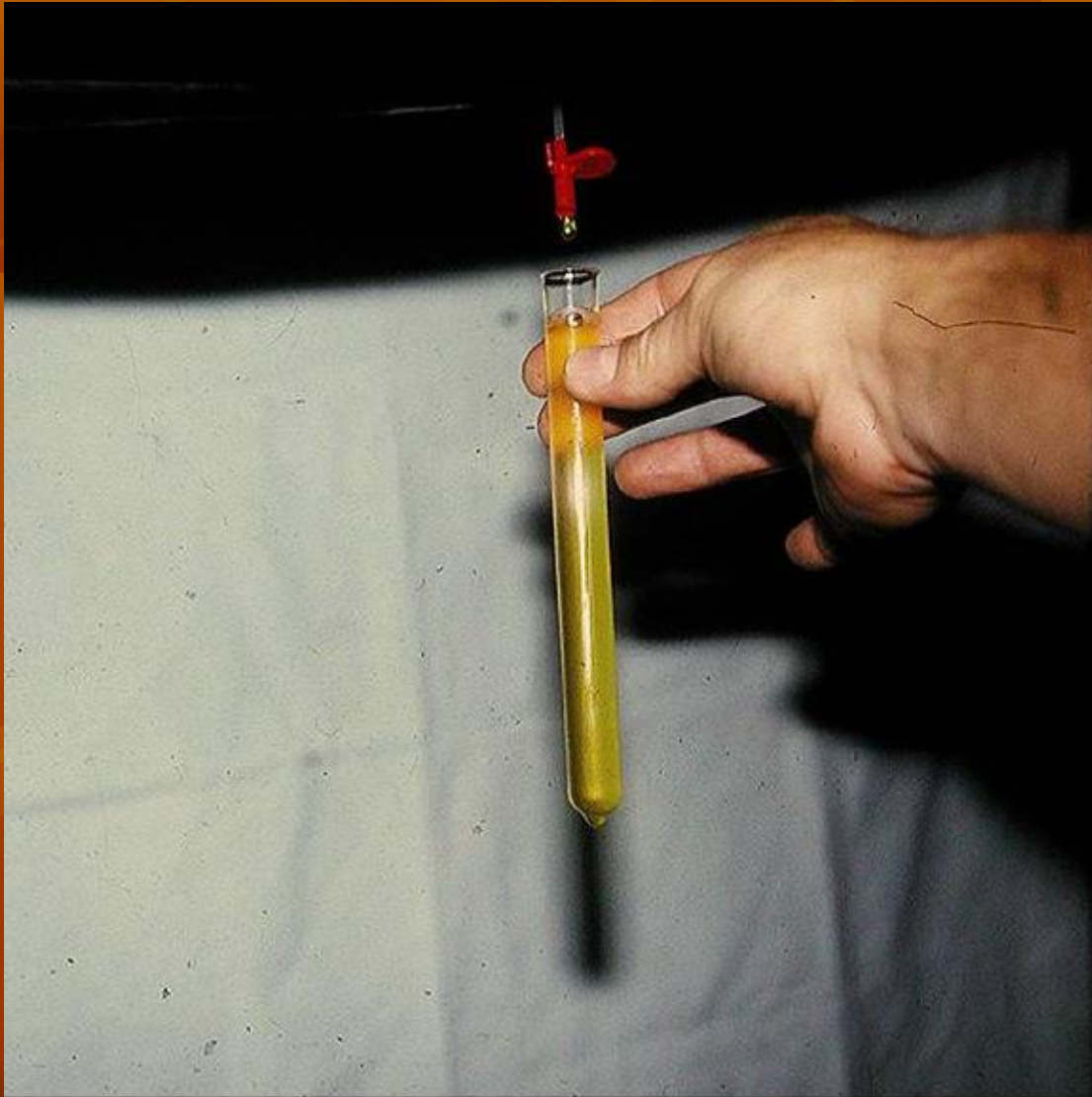
US helps, kick!



## 7. Abdominocentesis

- Clear-transparent, pale yellow
- Normal: WBC < 3000/ $\mu$ l  
TP < 2,5 g/dl
- Presence of bacteria, pH!
- Exploratory celiotomy, castration, laparoscopy:  
↑ TP, WBC
- orange fluid  $\Rightarrow$  strangulating ileus  $\approx$  surgery





## 7. Abdominocentesis

Strangulating ileus:

Poor perfusion+anaerob metabolism⇒**Lactate**↑

Lactate indicates endotoxic mitochondrial hypoxia

# Clinical relevance of lactate

Preop. Lactate measurement!:

- how hypoxic=assessment of perfusion
- how susceptible for endotoxins

Blood lactate < 2 mmol/l

Peritoneal > blood lactate  $\Rightarrow$  strang. ileus, ☹ prognosis

## Hypocalcemia in the blood

[Ca<sup>2+</sup>] ↓ in colic cases

Endotoxemia ⇒ PTH release in serum ⇒ Ca<sup>2+</sup> ↓

Intracellular Ca overload ⇒ inflammatory enzymes  
activated

HR- phrenic n. transmission-diaphragm ⇒ abd. wall tremor

# What to do?

- Pain relief
- Stabilization of cardiovascular + metabolic status
- Minimizing deleterious effects of endotoxemia
- Establishing a patent and functional intestine:
  - ✧ decompression of stomach, cecum, large colon
  - ✧ laxatives
  - ✧ antiendotoxin th.
  - ✧ th. for ischemia-reperfusion injury
  - ✧ antimicrobial th.
  - ✧ nutritional support
  - ✧ surgical intervention

## Diagnosis:

- Immediate surgical management or euthanasia
- Medical management with further monitoring and possible surgery
- Medical management

Decision can be based on the available information



# Indications for exploratory celiotomy in horses:

- persistent abdominal pain
- refractory to analgesics
- HR ↑
- progressive abdominal distention
- absence of borborygmi
- large quantities of gastric reflux
- abnormal rectal examination
- serosanguineous abdominal fluid with ↑TP and nucleated cell count

Early surgery ↔ visceral rupture!

# Status presens

	<b>conservative</b>	/	<b>surgical</b>
• Circulation:			
• Pulse	<80/min		<100/min
• Mucosa	pink – red		livid - cyanotic
• Body surface	N		cold
• PCV - TPP	< 50 ; 6-7.5 g/dl		>50 ; >7.5g/dl
• Alimentary tract			
• Palpation abdomen	not tight		+; ++; +++
• Peristaltic	N, hyperactive		∅
• Rectal exam.	Normal		pathological finding
• Nasogastric tube	no reflux		reflux
• Abdominocentesis	clear, transp.,		turbid, reddish
• Us	N		not normal
• Pain, faces?			

# Non-intestinal colic disorders

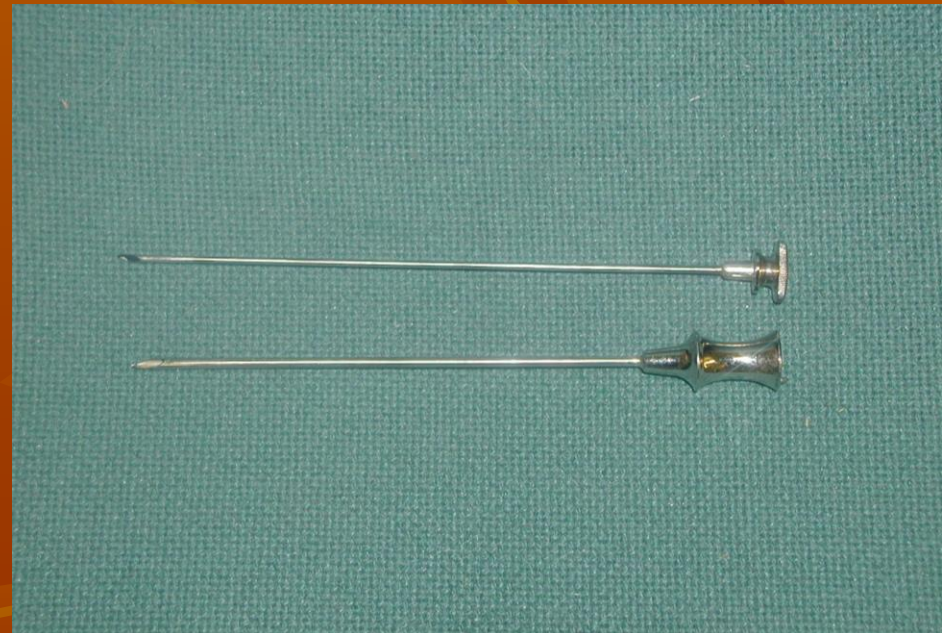
- cardiovascular (a. iliaca thrombus, pericarditis)
- airways (pleuritis, pleuropneumonie)
- abdominal cavity (tumor, abscess, peritonitis, haematom)
- liver (cholelithiasis, cholangiohepatitis)
- spleen (abscess, splenomegalie)
- urogenital tract (nephrolits, pyelonephritis, cystitis, ruptured bladder, uterus torsion)

# Basic equipment for colic examination in the praxis

- stethoscope
- twitch
- Nasogastric tube
- Rectal gloves, gel
- PCV centrifuge, refractometer
- Caecum trocar, iv. catheter
- Drugs

Transabdominal caecum puncture  
aseptic surg. preparation, ab,  
Marek trocar with stylet, in a standing horse

(Large colon transrectal decompression if surg.  
not possible)



# Treatment

- 1. Analgetics:

- decompression - nasogastric tube,
  - caecum head/LC trocarisation
- Detomidine, Xylazine
- Butorphanol (0,1mg/kg)
- Novamino – Sulfon: Vetalgin, Novalgine
- Metamizol-Na: Buscopan, Chosalgan
- Flunixin meglumin: Finadyne

# Treatment

## 2. Fluid therapy:

- Reduce hypovol:

Kristalloid: 20-40 ml / kg / h ~10-20 l/h  
hypertonic saline 4ml/kg=2 l

Kolloid: HES 10ml/kg, Dextran inf.

## ■ 3. Antiendotoxines:

Flunixin (reduced dose), polymyxin B, frozen plasma

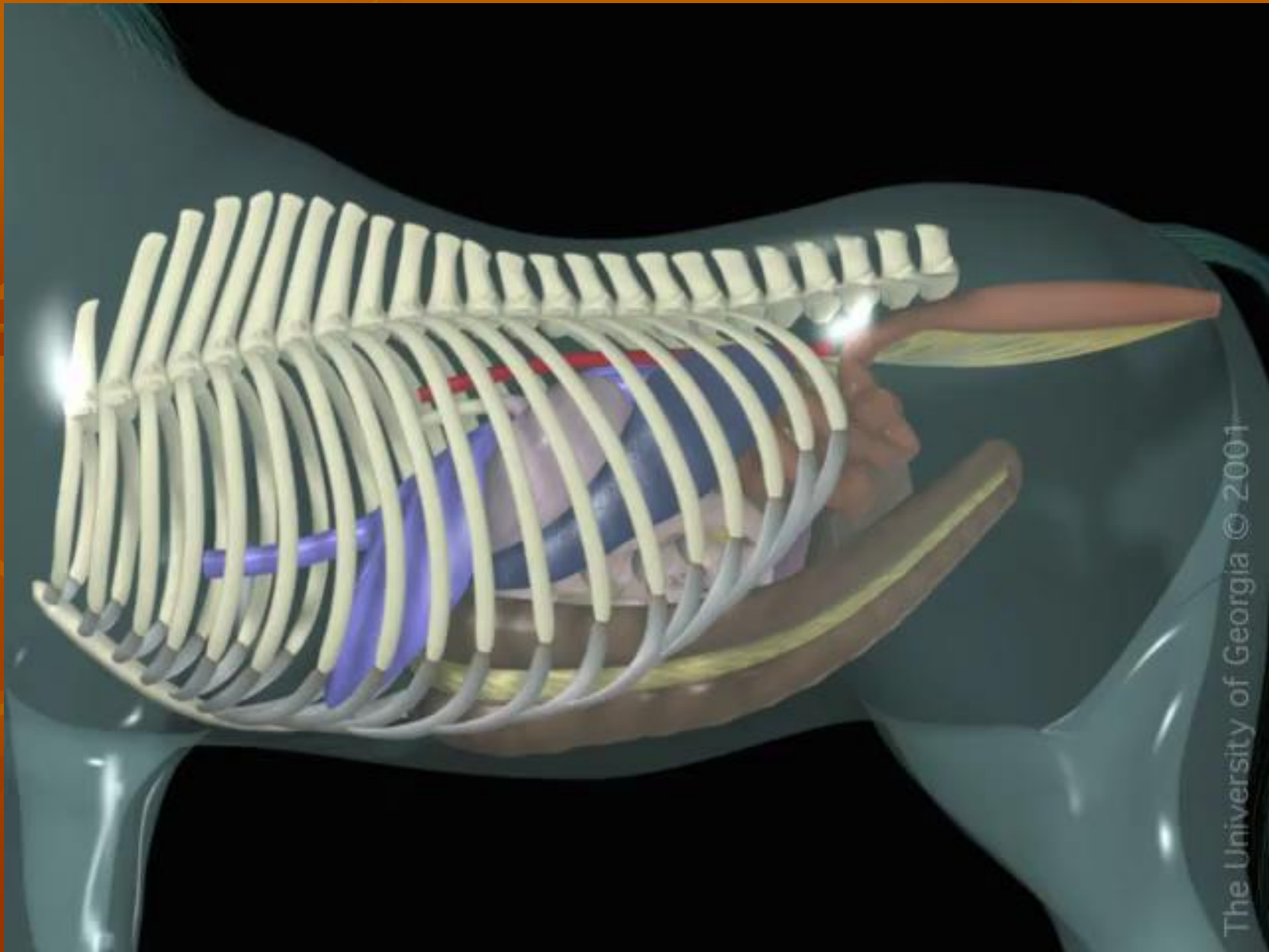
## ■ 4. Laxatives

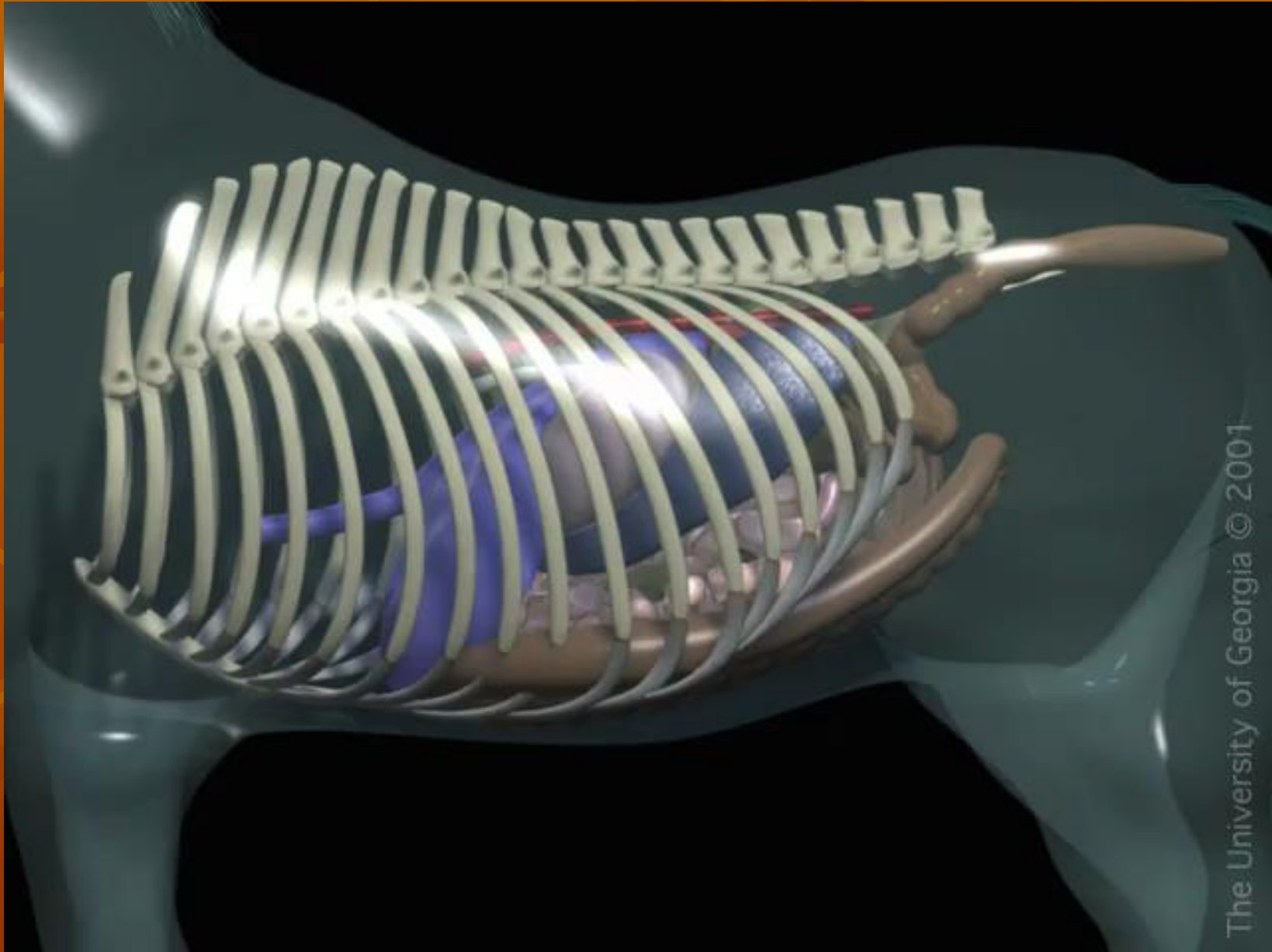
paraffin, linseed

# Treatment

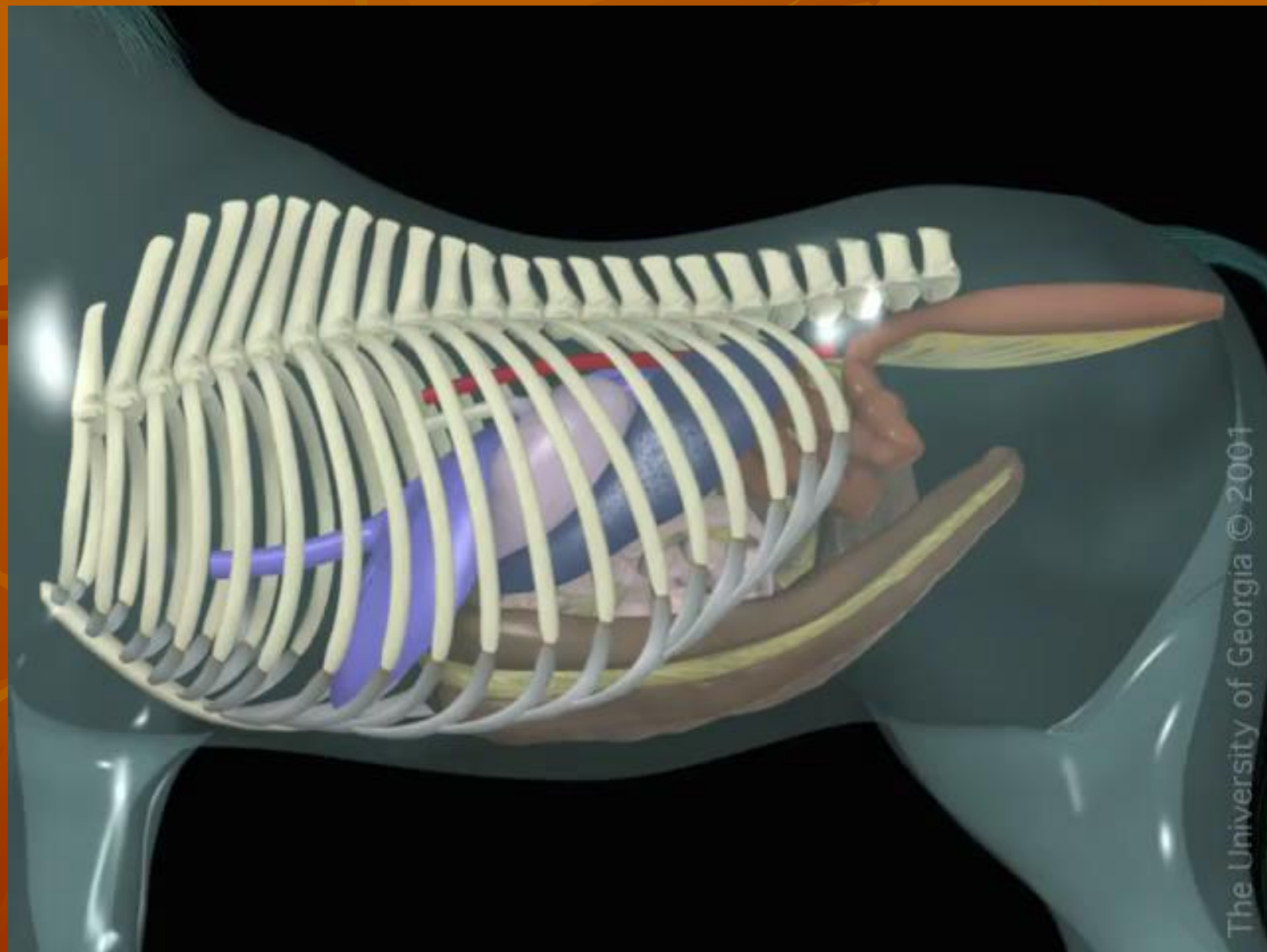
- 5. Cholinergic stimulates:
  - metoclopramide (Cerucal)
  - Neostigmine: stimulates large colon, stomach should be empty, carefully! (Konstigmin)
- 6. Colic surgery (exploratory celiotomy)

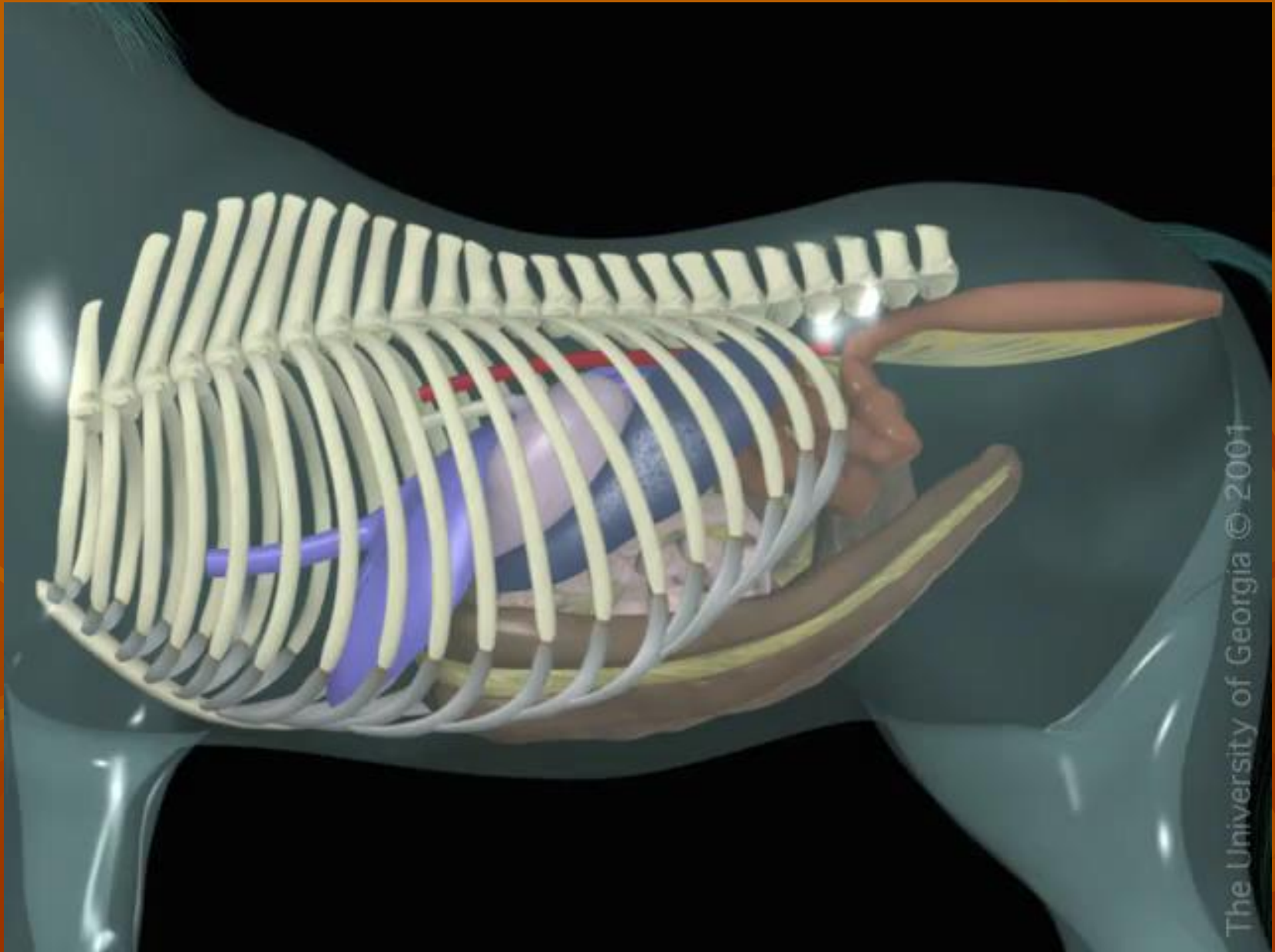




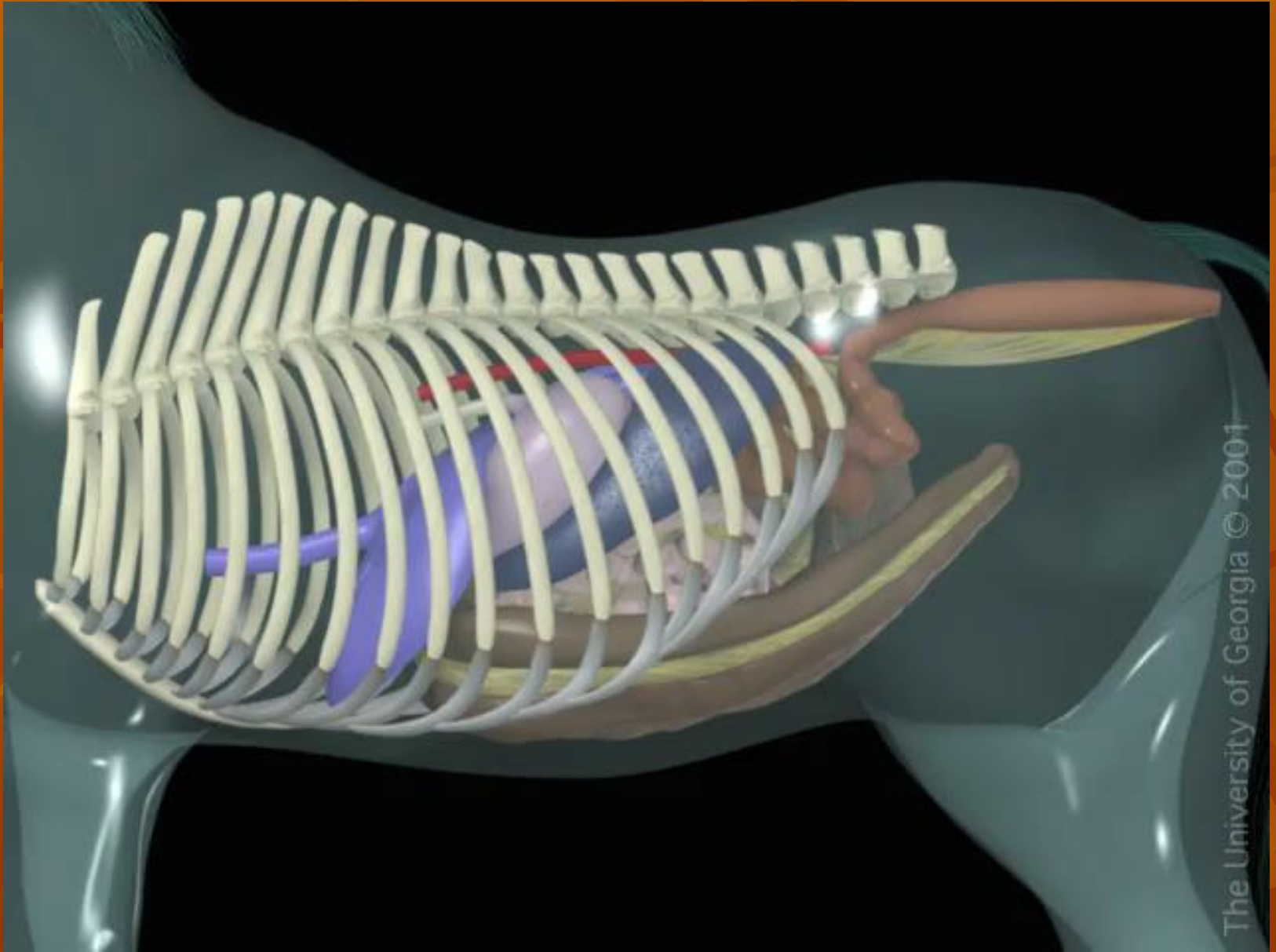


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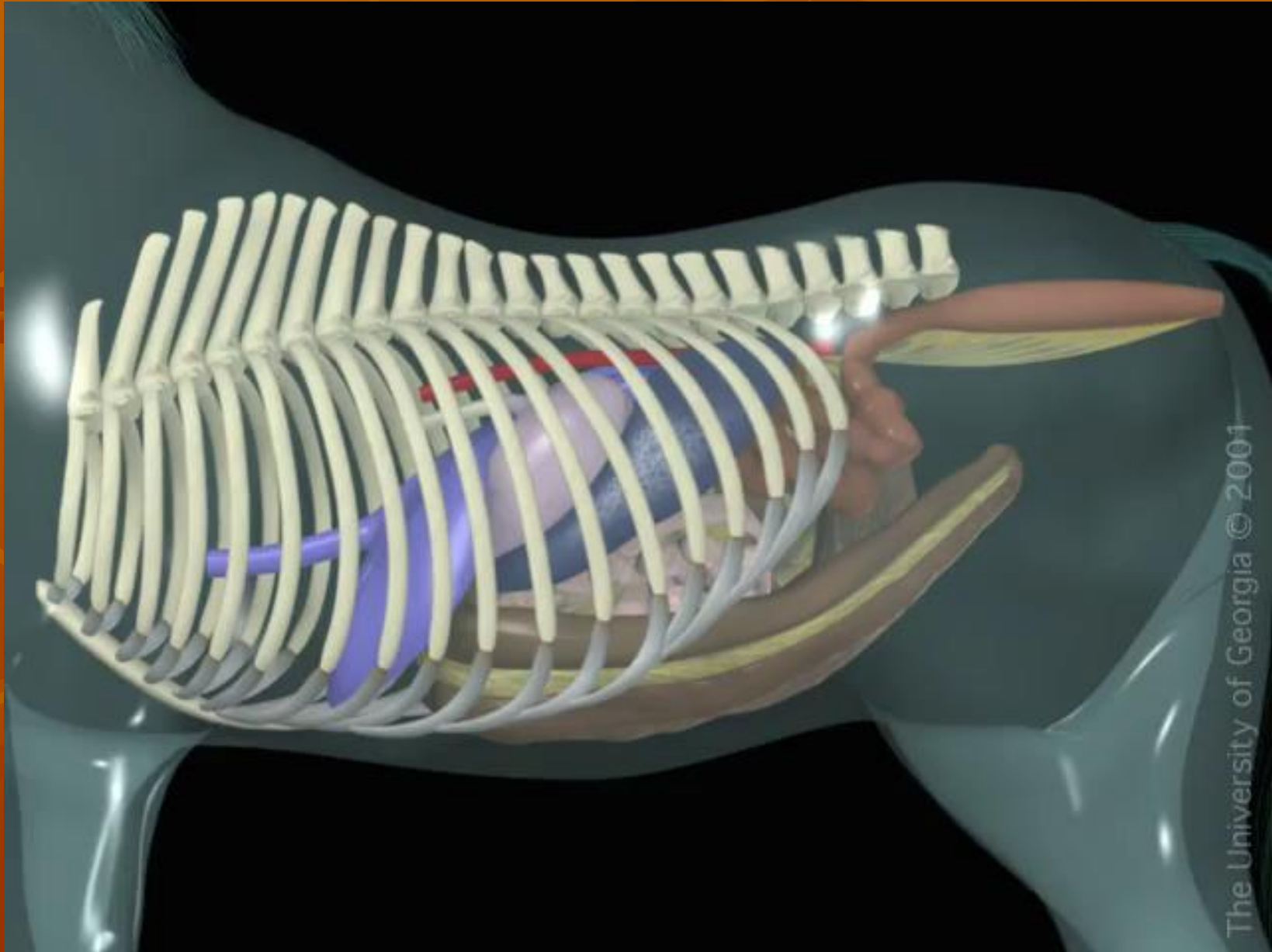


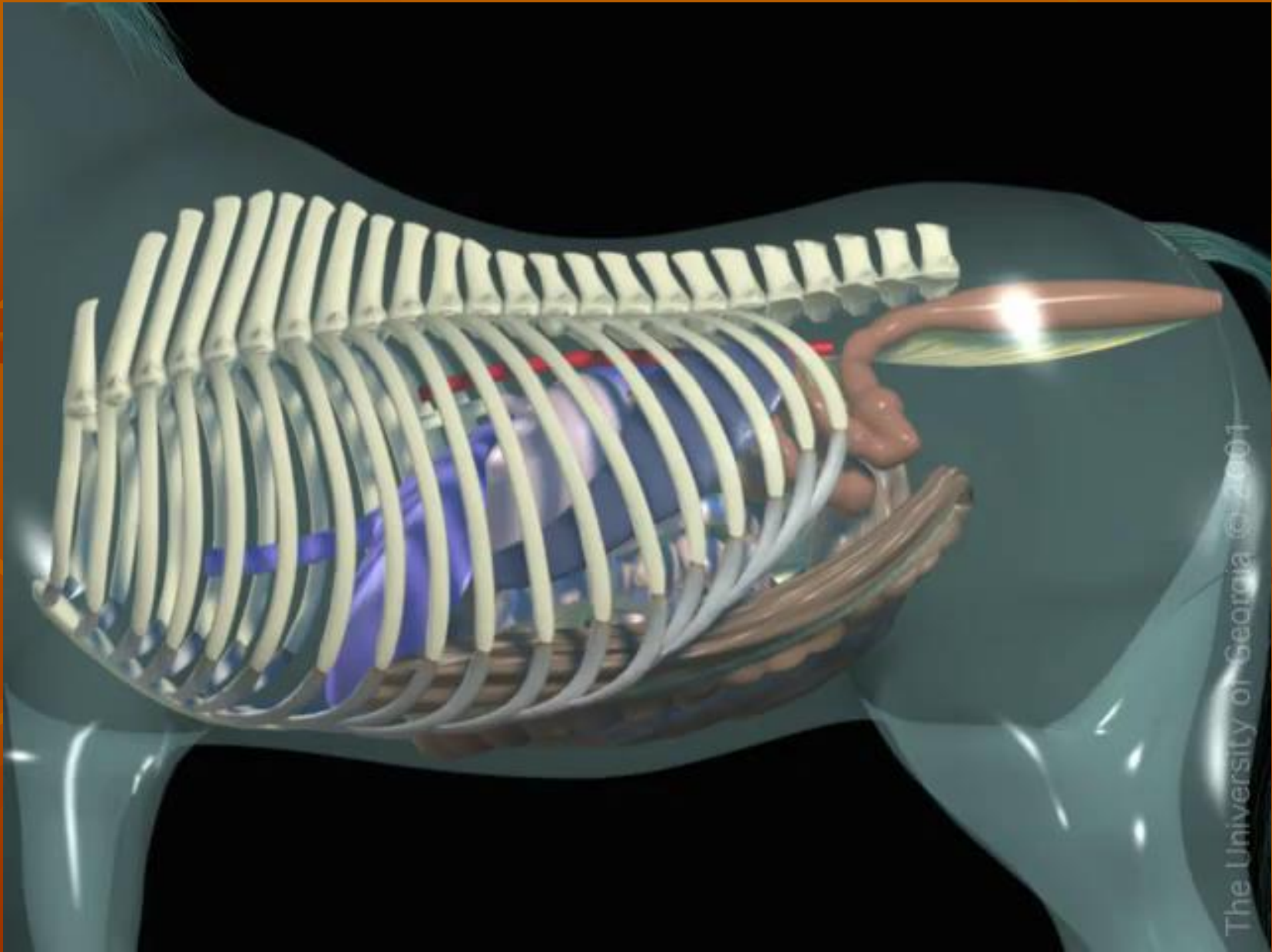


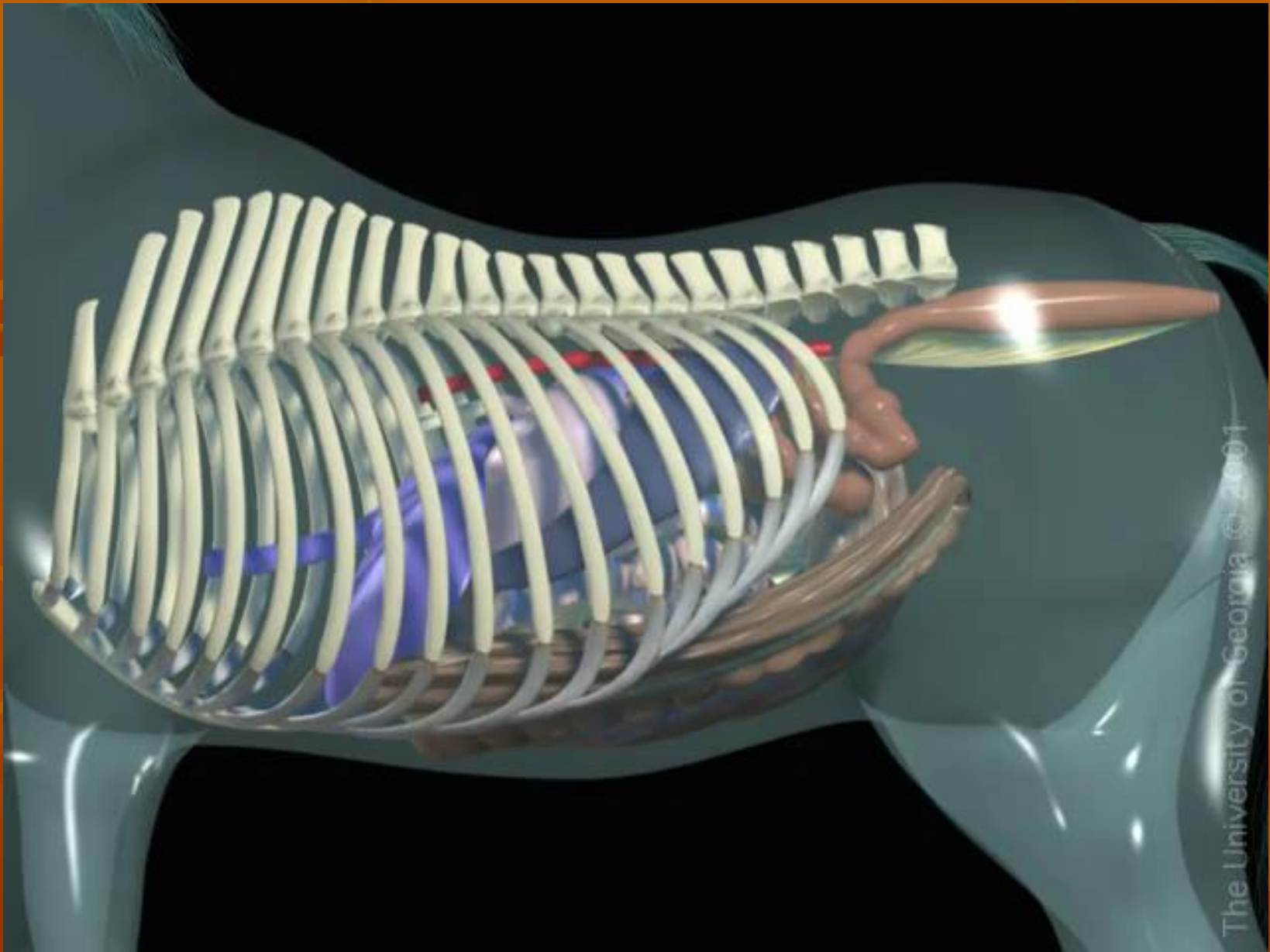
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# References

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- [www.glasshorse.com](http://www.glasshorse.com)
- Download pdf: [www.loklinika.hu](http://www.loklinika.hu) (pw: student)

**Thank you for your attention!**

