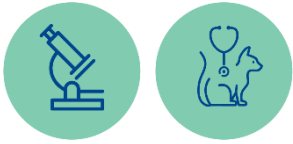


Veterinary Bioscience: Digestive System



PRACTICAL 6 ABDOMEN DISSECTION

TEACHING STAFF

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LOCATION

- WEBS (Building 125) Dissection Laboratory (Room B104)

INTENDED LEARNING OUTCOMES

At the end of this class, you should be able to:

- Identify the major external landmarks of the abdomen.
- Recognise and identify the rectus abdominis muscle and line alba.
- List the names of the muscles of the body wall.
- Identify the different parts of the dog gastrointestinal tract: stomach, duodenum, pancreas, ileum, jejunum, caecum, ascending, transverse and descending colon; rectum and anus.
- Identify the cranial and caudal mesenteric arteries supplying the gastrointestinal tract, and the portal vein draining the GI tract.
- Understand the arrangement of the great mesentery and identify the root of the mesentery.
- Understand the relationship of the greater omentum with the stomach and spleen.
- Palpate the anal sacs and locate the openings of the ducts.
- Manually express the anal sacs.

CLASS PREPARATION

- A photographic guide to dissection of the dog abdomen is available on the LMS, which should be reviewed **prior** to class.
- Note that for this class, the specimens provided for dissection can be dogs or cats, depending on availability.

REFERENCES

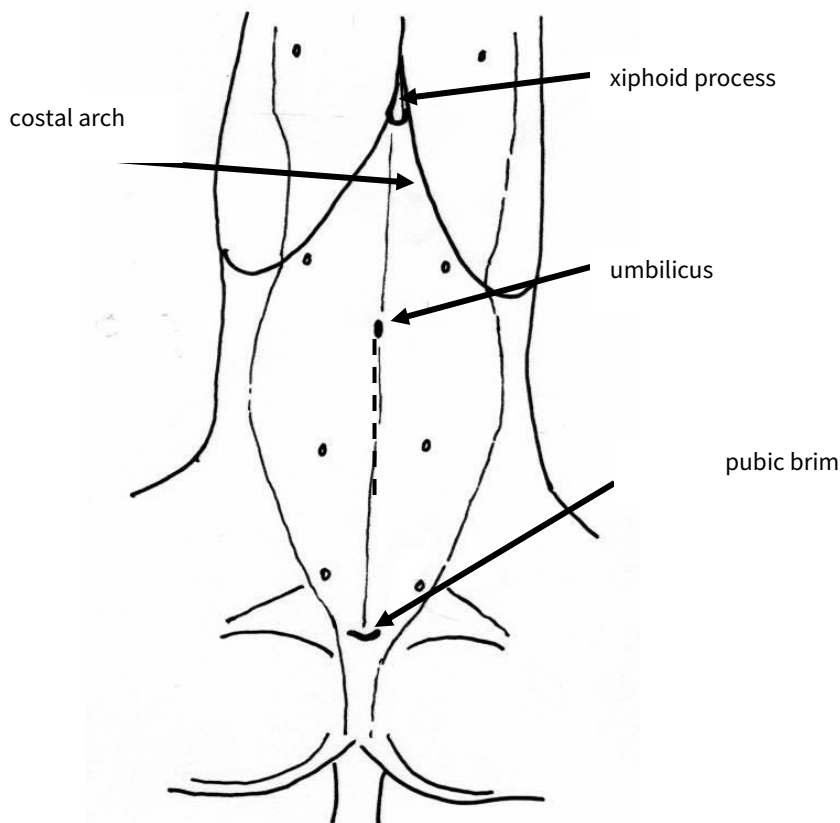
- Evans & de Lahunta. *Miller's Guide to the Dissection of the Dog* (3rd edition or later).
- Singh. *Dyce, Sack & Wensing's Textbook of Veterinary Anatomy* (any edition).

PROCEDURE

Part A: midline coeliotomy

This is a common surgical approach to the abdomen, which might be used for removing an intestinal foreign body or for a general exploration of the abdominal organs (exploratory laparotomy).

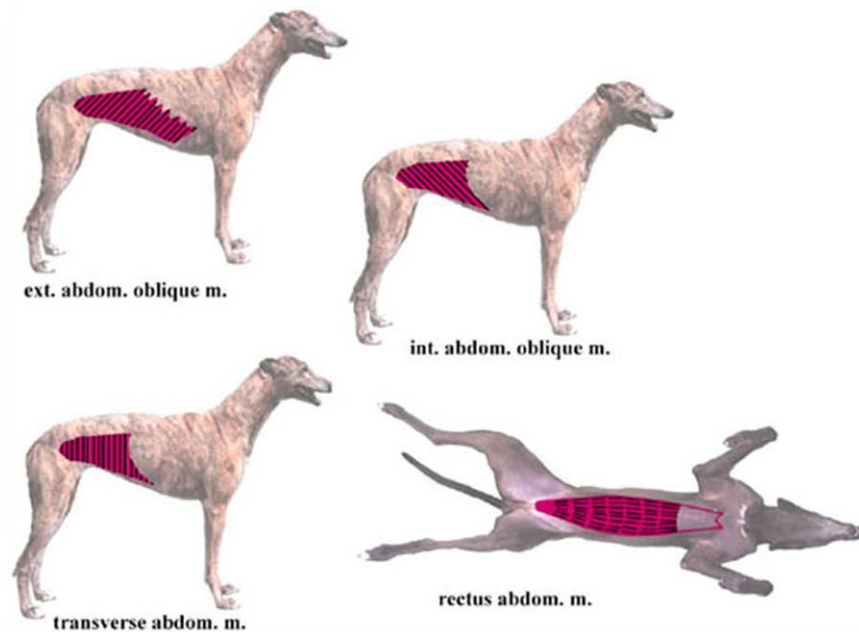
1. Identify the main surface landmarks of the ventral abdomen: the umbilicus, the xiphoid process, the costal arch and the pubic brim.



2. Incise through the skin from the umbilicus half way to the pubic brim (approximately 10-15cm).
 3. Continue through the subcutaneous fat (very little in the greyhound) until the underlying muscle can be seen (rectus abdominis). Identify the white line (thin fascia) separating the muscles (linea alba).
 4. Carefully incise through the linea alba, and a very thin transparent membrane, the peritoneum, can be seen.
 5. Cut through the peritoneum and into the peritoneal cavity. The first thing observed is the lacy (fatty) membranous tissue of the greater omentum.
 6. Move the omentum cranially and observe the underlying intestinal structure
- Q.** Is this small or large intestine – and which part?

Part B: Abdominal wall

The abdominal wall supports and protects the abdominal viscera and provides a strong muscular container that can develop significant levels of pressure to aid in the evacuation of the pelvic canal (defaecation, parturition). These muscles are shown below. The external and internal abdominal oblique muscles have fibres running in opposite directions. The innermost layer is the transverse abdominal muscle. The origins and insertions of these muscles will be considered later in the course, in the musculoskeletal module.



Now turn the dog so that it lies on the right side.

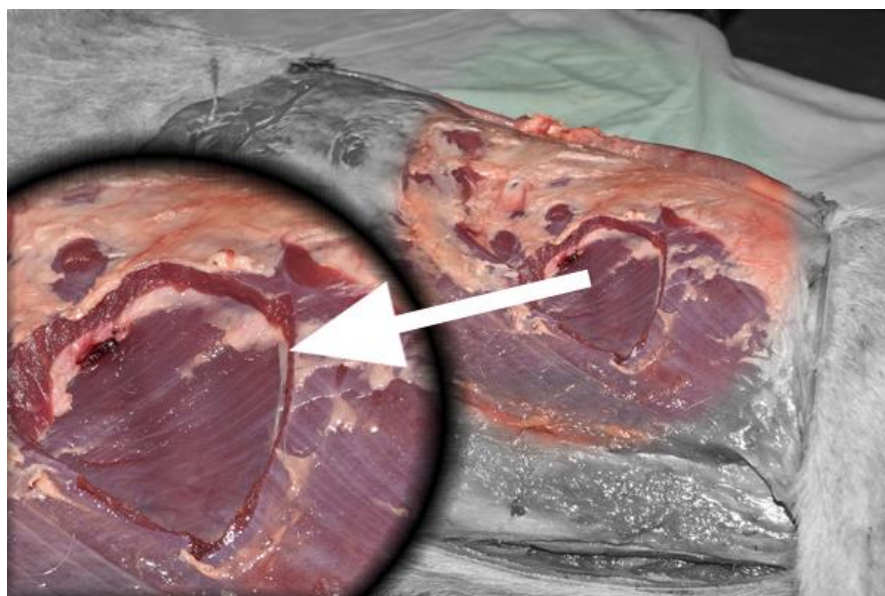
7. Extend the incision from the xiphoid process to the pubic brim.
8. Reflect the skin of the flank by making incisions from either end of the opening directly dorsally towards the back muscles (as shown).



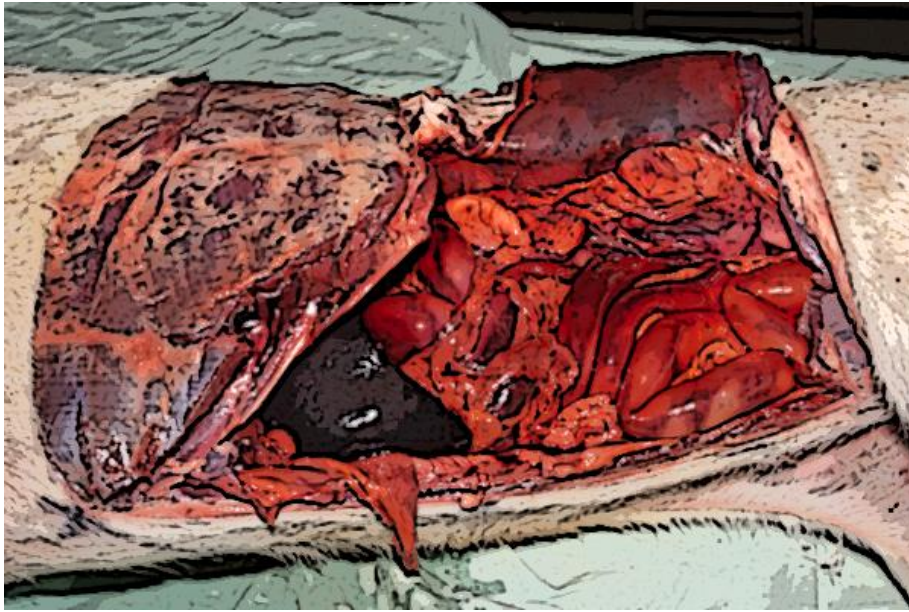
9. Note: A) the strap-like rectus abdominis muscle, and B) the external abdominal oblique muscle, with its fibres running in a craniodorsal to caudoventral direction:



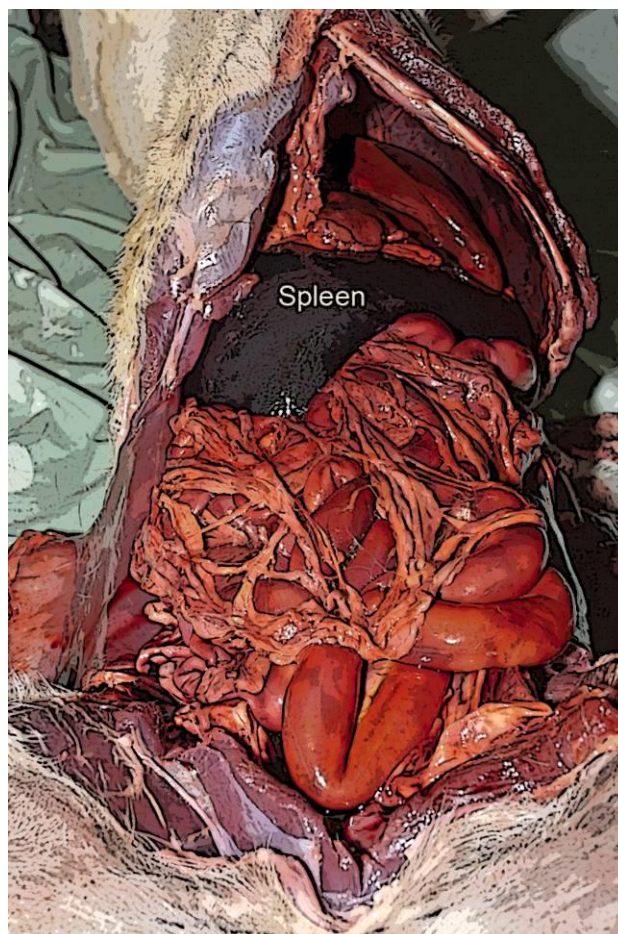
10. Carefully cut a 5cm square window through the external abdominal oblique (as shown) to view the internal abdominal oblique muscle with its fibres running in the opposite direction.



11. Reflect the lateral abdominal body wall by cutting around the edge of the costal arch and just cranial to the pelvis (as shown).

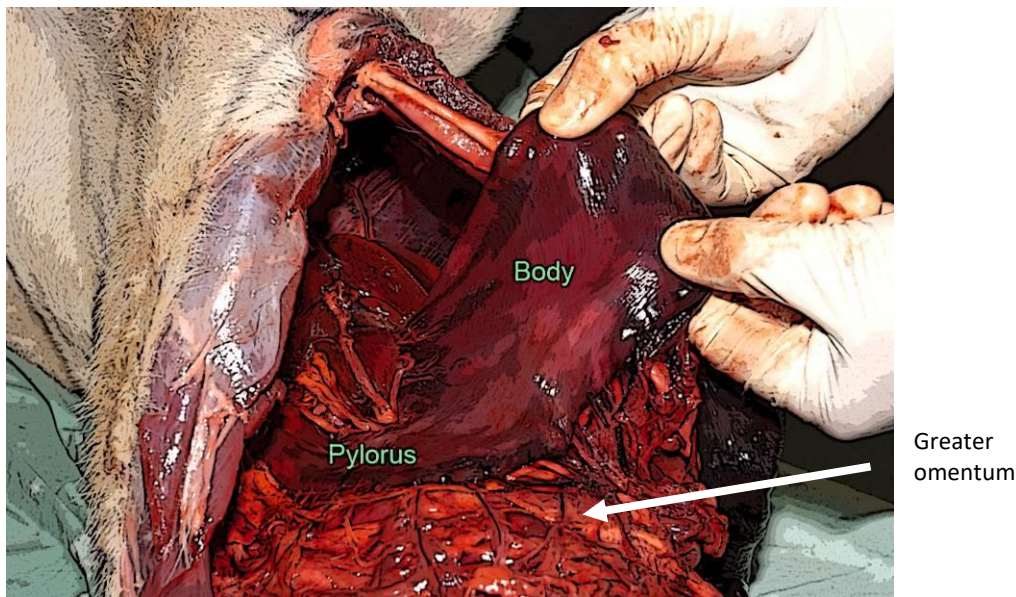


12. Turn the dog onto its back and reflect the right lateral abdominal wall (skin and muscle together) to completely reveal the abdominal contents.



Part C: Abdominal contents

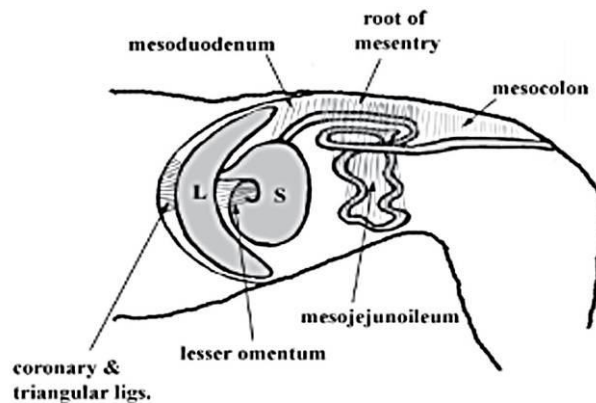
13. Firstly, reflect the enlarged spleen to the left side, bringing it out of the abdomen to uncover the stomach and the other cranial abdominal organs.
14. Then note the extent of the greater omentum (fold of peritoneum). Note how much of the ventral aspect of the GI tract is covered by this membrane. Tease apart the two sheets to reveal the omental bursa.
15. Follow the greater omentum to the stomach. This is the greater curvature.
16. Identify the body, fundus and pylorus. Note that the body and fundus of the stomach is on the left, and the pylorus lies on the right of midline.



17. Identify the lesser curvature of the stomach, and the lesser omentum (peritoneum) which connects the stomach to the liver.
18. Incise into the stomach, between the greater and lesser curvatures. Observe the folds of the inner stomach lining.
19. Continue your incision to the pylorus, and observe the muscle thickening at the pyloric sphincter.
20. Identify the first part of the duodenum as it leaves the pylorus. Note the two lobes of the pancreas on the inside of the cranial duodenal flexure.
21. Incise into the first part of the duodenum (10cm or so). Gently wash the contents to reveal the mucosal surface. Observe the greater duodenal papilla and place a blunt probe into the common bile duct.
22. A further 4 - 5cm along the duodenum, you may observe the minor duodenal papilla.

Q. What secretions enter the duodenum through this duct?

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23. Follow the descending duodenum as it bends (caudal flexure) around the root of the mesentery. The ascending duodenum then continues as the jejunum.
24. Spread out the loops of jejunum to examine the long mesentery containing blood vessels, nerves and lymphatic vessels. Follow the great mesentery to its root.

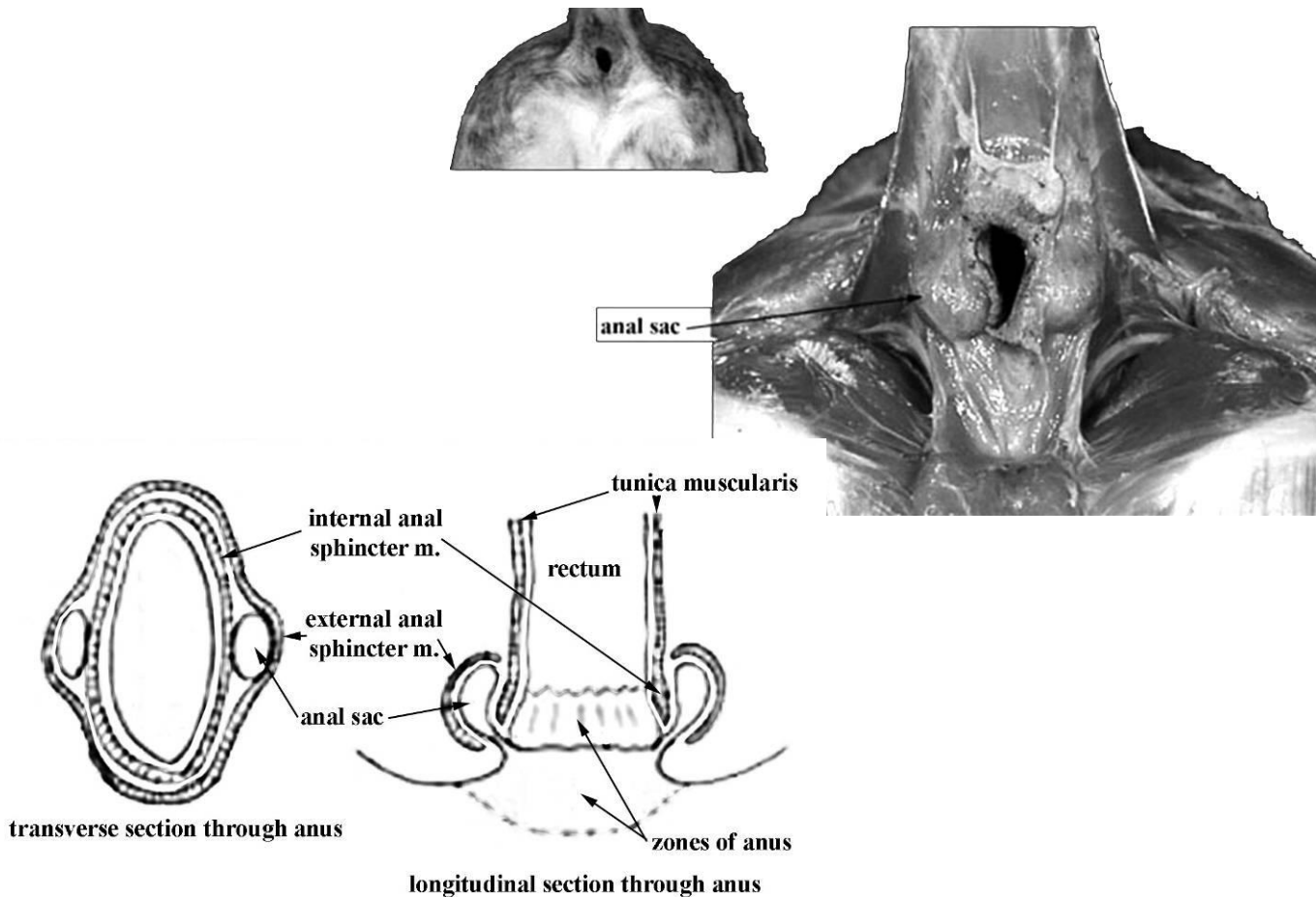
Q. What blood vessel enters here?

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25. Cut into a 5cm section of jejunum. Note the smooth velvety texture of the mucosa.
 26. Follow the loops of jejunum until you come to the small spiral caecum – this is the ileo-caeco-colic junction.
 27. Incise into this region to observe the ileocolic orifice surrounded by the annular fold. Adjacent to this is the slightly wider caeco-colic orifice.
 28. The short ascending colon becomes the transverse colon which passes cranial to the root of the mesentery. Then the descending colon takes a relatively straight course towards the pelvic inlet.
 29. Note the short mesentery attaching the descending colon to the dorsal body wall.
Also note the caudal mesenteric artery supplying the descending colon and rectum.
 30. The descending colon passes dorsally to the neck of the bladder and becomes the rectum within the pelvic cavity.
 31. Reflect the intestines and stomach to the left side of the abdomen to reveal the underlying structures. The largest blood vessel visible is the caudal vena cava, bringing blood back to the heart from the hindlimbs and lumbar region. The smaller vessel is the portal vein, draining blood away from the intestines, stomach and pancreas to the liver.

Part D: Anus and anal sacs

Functional closure of the anal orifice is achieved by a set of muscular rings, which are the internal (smooth muscle) and the external (striated muscle) anal sphincters. Opening of these sphincters facilitates evacuation of the rectum (defaecation) when the internal pressure within the abdomen is increased through contraction of the muscles of the abdominal wall.

Either side of the anus are a pair of small sinuses, referred to as the anal sacs, which empty their contents during defaecation. The openings of the anal sacs are located laterally near the inner boundary of the visible cutaneous zone of the anus. The sacs themselves are about the size of a pea and inserted between the internal and external anal sphincters just ventral to their excretory duct openings. The anal sacs are clinically important.



Procedure:

32. Palpate the sacs on either side of the anus (ventrolaterally).
33. Identify the openings of the ducts from the anal sacs, which open just by the outside of the anus (4 o'clock and 8 o'clock). Insert a blunt probe into the ducts.
34. Gently express the contents of the anal sacs using thumb and forefinger (use cotton wool to soak up the contents, and stand well back!).