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Splanchnology (Introduction)

- The word **"Splanch"** means viscera
- Viscera: The viscera denote the internal organs of the thoracic, abdominal and pelvic cavities.
- Splanchnology: is the study of the internal organs/visceral organs. It includes:
  - Digestive system
  - Respiratory and
  - Uro-genital system
- Organs those have canal system are called Tract.
- Basic anatomical structure of these organs are same.
  Grossly, all consist of 4 layers: Tunica mucosa, Tunica submucosa, Tunica muscularis externa, Tunica serosa.

BODY CAVITIES AND THEIR SEROUS LINING

The body cavities can be divided into three different zones:

- Thoracic cavity
- Abdominal cavity-Largest
- Pelvic cavity

Contents of body cavities:
Thoracic cavity: Trachea, bronchi, lungs, esophagus, heart, aorta, cranial and caudal venacava, blood vessels, lymphvessels, lymphnodes.

Abdominal cavity: Stomach, small intestine, most of the large intestine, liver, gall bladder, bile ducts, pancreas, spleen, kidneys, upper part of the ureters, adrenal glands, blood vessels, lymphvessels, glands, lymphnodes. In female: Ovaries, Uterus.

Pelvic cavity: rectum, urinary bladder, urethra. In male, accessory male sex glands, spermatic cord, ductus deferens. In female, part of uterus, vagina, vaginal vestibule.

THORACIC CAVITY

The thoracic cavity lies within the thoracic cage. It begins at the cranial opening of the chest (thoracic inlet/cranial aperture) and ends at the thoracic outlet (thoracic outlet/caudal aperture). The pectoral cavity is the section of the thoracic cavity cranial to the diaphragm.

Thoracic inlet: is formed by dorsally by the first thoracic vertebra, laterally by first pair of ribs and costal cartilages and ventrally by the manubrium sterni.

Thoracic outlet: is formed by the last pair of the thoracic vertebra dorsally, last pair of ribs laterally and cranial part of the xiphoid cartilage ventrally.

Boundary of thoracic cavity: thoracic cavity is formed dorsally by the thoracic vertebrae; ligament and muscles connected with them, ventrally by sternum, cartilages of the sternal ribs and muscles connected with them, laterally by ribs and intercostals muscles, cranially thoracic inlet and caudally by the diaphragm.

ABDOMINAL CAVITY

Boundary: Abdominal cavity is formed dorsally by the lumbar vertebrae, lumbar muscles and lumbar part of the diaphragm; the lateral wall is formed by the oblique and transverse abdominal muscles, the abdominal tunic; the

ventral wall is formed by the two recti, the aponeurosis of the oblique and transverse muslcles and xiphoid cartilage; the cranial wall is formed by the diaphragm and caudal wall is formed by the imaginary line of the pelvic inlet.

PELVIC CAVITY

The pelvic cavity (cavum pelvis) is the caudal continuation of the abdominal cavity. There is no wall between the abdominal and pelvic cavities. The imaginary line between the abdominal and pelvic cavities is called the terminal line or brim of the pelvis.

Boundary: The pelvic cavity is formed dorsally by the sacrum and first three coccygeal vertebrae; ventrally by the by the pubic and ischial bones; laterally by the parts of the ilum and sacro-iliac ligament.

Pelvic inlet: is formed dorsally by the sacrum and first three coccygeal vertebrae, laterally by the parts of the ilia and sacro-iliac ligament and ventrally by the pubic and ischial bones.

Pelvic outlet: is formed by the third coccygeal vertebra dorsally, the ischial arch ventrally and laterally by the posterior edges of the sacro-iliac ligaments and the semimembranosus muscles.

STRUCTURE OF THE BODY CAVITIES

The internal structure of any body cavities is similar. Cross scetion of body wall shows following layers:

- Skin
- Superficial trunk fascia,
- Skeletal muscles
- Internal trunk fascia and the
- Serous membrane/serosa

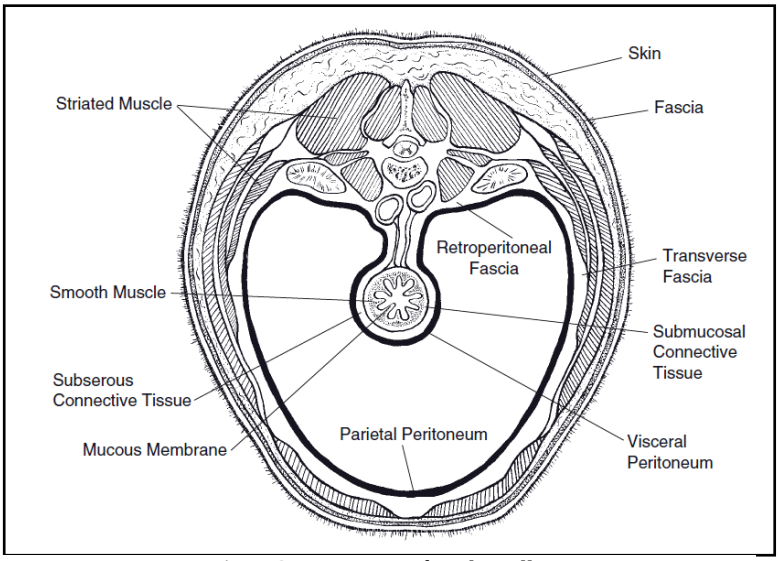

Fig. 1 Cross-section of Body wall

Serous membranes: Pleura, Pericardium, Peritoneum

Serous membrane lines almost completely the body cavities. There are four serosal cavities:

- Right pleural cavity
- Left pleural cavity
- Peritoneal cavity and
- Pericardial cavity

Serous membrane covers the outside of the organs and lines the inner walls of the body cavities. Any serous membrane (tunica serosa) consists of a single layer of flat epithelium (mesothelium) and loose connective tissue. The serous membranes secrete watery serous fluid which is transparent, moist, smooth and shiny.

Peritoneum

Peritoneum is the thin serous membrane which lines the abdominal cavity and pelvic cavity and covers the organs or viscera contained therein.

According to their location in the peritoneal cavity, the organs are classified into two types:

- Intraperitoneal organ (e.g. stomach, intestines, liver)-located inside the peritoneal cavity.
- Retroperitoneal (e.g. kidneys, adrenal glands)- located outside the peritoneal cavity.

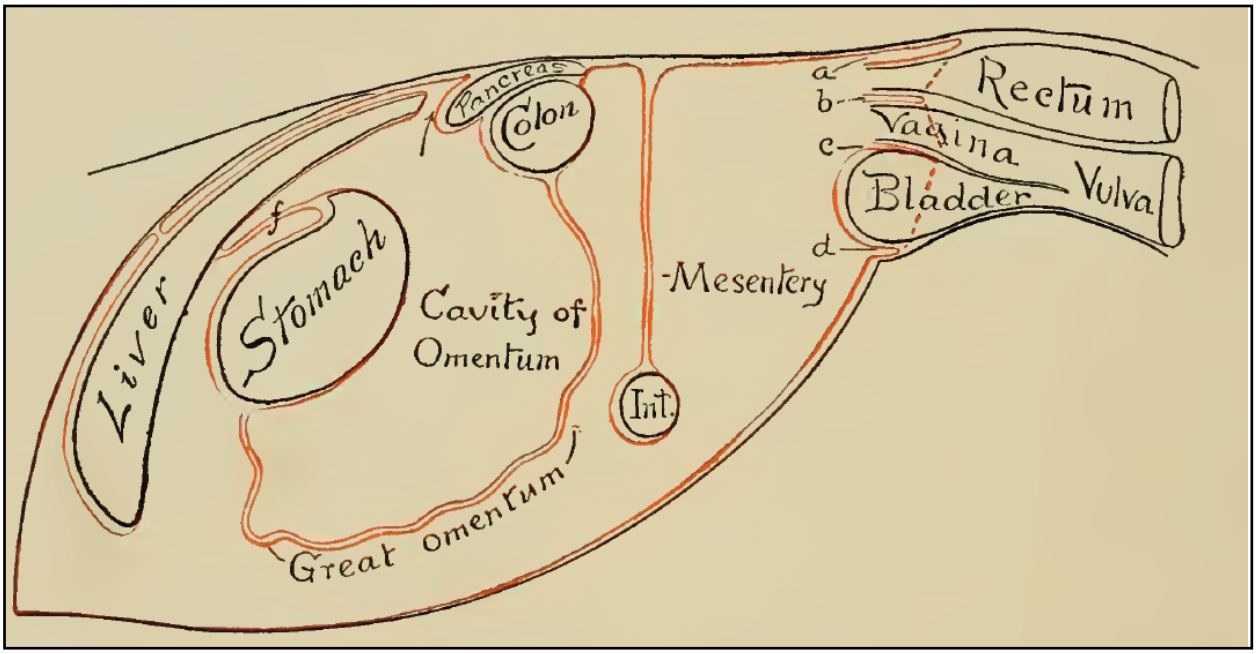

Fig. 2 Diagram of peritoneum, its modifications and pouches. a: Sacro-rectal Pouch, b: Recto-genital pouch, c: vesico-genital pouch, d: pubo-vesicle pouch

Layers of Peritoneum: Like other serous membrane, it has two layers:

- Parietal layer: lines the abdominal wall
- Visecral layer: covers the organs or viscera within the abdominal and pelvic cavities.

Peritoneal cavity:

Cavity between the parietal and visceral layer of the peritoneum. It contains serous fluid secreted by the peritoneal cells and thus preventing friction between them.

Modifications of the peritoneum: Omentum, mesentery and ligaments

Omentum: A peritoneal fold which passes from the stomach to other viscera. There are three kinds of omentum namely:

- Small omentum/ gastro-hepatic omentum: which passes from the lesser curvature of the stomach to the liver
- Greater omentum: Attached to the greater curvature of the stomach and covers the ventral surface of the peritoneal cavity like a curtain.

Mesentery: Mesentery is the double fold of peritoneum which attaches the intestine to the dorsal abdmoinal wall. eg; mesoduodeum, mesocolon etc. Perioneal fold which attached the duodenum to the abdmoinal wall is called (mesoduodenum). Perioneal fold which attached the colon to the abdmoinal wall is called (mesocolon).

Ligaments: Ligaments are peritoneal folds which pass between viscera and connect them with the abdominal wall. Eg; broad ligament of female genital tract.

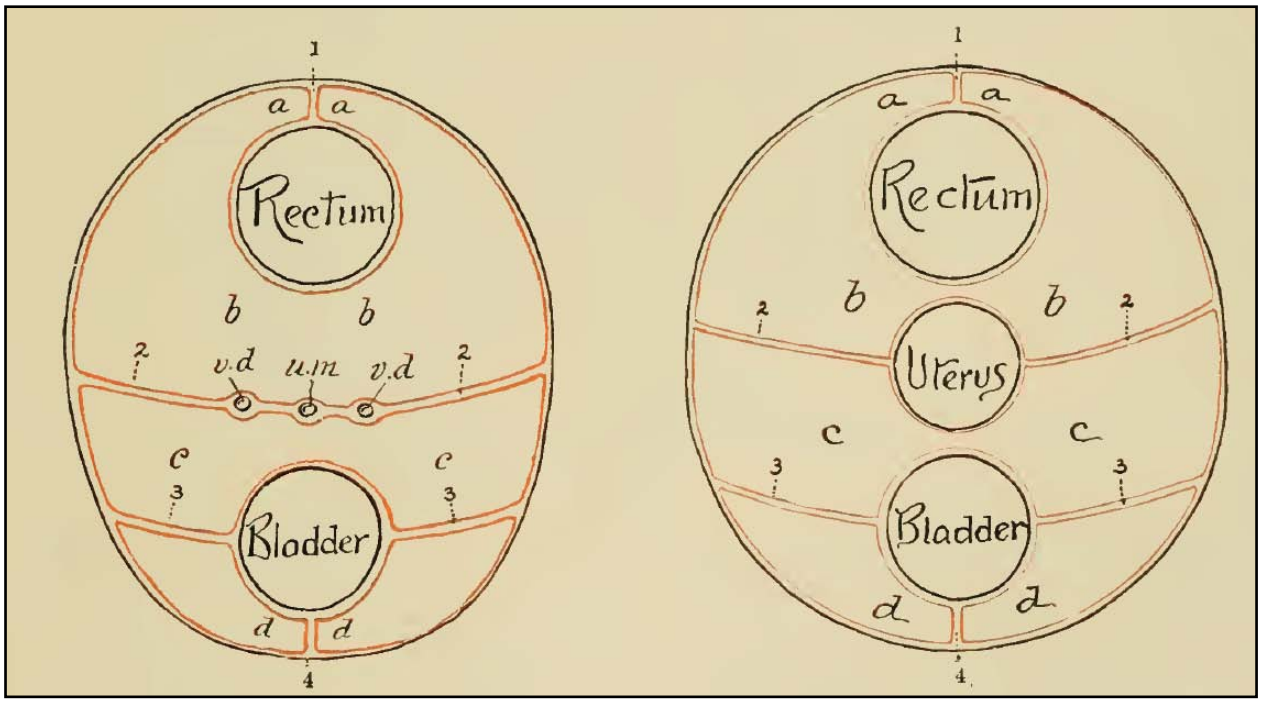

Fig. 3 Arrangement of Pelvic Peritoneum in male (left) and female (male)