22.3: The Peritoneum

The peritoneum, the serous membrane that forms the lining of the abdominal cavity, covers most of the intra-abdominal organs.

Learning Objectives

• Differentiate among the digestive organs and their location relative to the peritoneum

Key Points

• The peritoneum supports the abdominal organs and serves as a conduit for their blood and lymph vessels and nerves.
• There are two layers of the peritoneum: the outer layer, called the parietal peritoneum, is attached to the abdominal wall; the inner layer, the visceral peritoneum, is wrapped around the internal organs that are located inside the intraperitoneal cavity.
  The mesentery is the double layer of visceral peritoneum.
• The potential space between these two layers, the peritoneal cavity, is filled with a small amount of slippery serous fluid that allows the two layers to slide freely over each other.
• The structures in the abdomen are classified as intraperitoneal, retroperitoneal, or infraperitoneal, depending on whether they are covered with visceral peritoneum and are attached by mesenteries.
• There are two main regions of the peritoneum connected by the epiploic foramen: the greater sac or general cavity of the abdomen, and the lesser sac or omental bursa.
• Intraperitoneal organs and retroperitoneal organs weave in and out of these membranes, and serve varying functions. Retroperitoneal structures tend to be more static than intraperitoneal ones.
Key Terms

- **greater omentum**: A large fold of visceral peritoneum that hangs down from the stomach.
- **retroperitoneal**: Located outside of the peritoneum.
- **serous membrane**: A thin membrane that secretes serum that lines an internal body cavity, such as the peritoneum, the pericardium, and the pleura.
- **peritoneum**: In mammals, the serous membrane that lines the cavity of the abdomen and that is folded over the viscera.
- **intraperitoneal**: Within the cavity of the peritoneum.
- **mesentery**: The membrane that attaches the intestines to the wall of the abdomen and maintains their position in the abdominal cavity to supply them with blood vessels, nerves, and lymphatics.

**EXAMPLES**

In one form of dialysis, called peritoneal dialysis, a glucose solution is sent through a tube into the peritoneal cavity. The fluid is left there for a prescribed amount of time to absorb waste products, and then removed through the tube. This form of dialysis is effective because of the high number of arteries and veins in the peritoneal cavity which, through the mechanism of diffusion, remove waste products from the blood.

The peritoneum is the serous membrane that forms the lining of the abdominal cavity or the coelom. It covers most of the intra-abdominal, or coelomic, organs. It is composed of a layer of mesothelial tissue, supported by a thin layer of connective tissue.

The peritoneum provides support and protection for the abdominal organs, and is the main conduit for the associated lymph vessels, nerves, and abdominal arteries and veins.

The abdominal cavity is the open space surrounded by the vertebrae, abdominal muscles, diaphragm, and pelvic floor. Remember not to confuse the abdominal cavity with the intraperitoneal space, which is located within the abdominal cavity and wrapped in peritoneum tissue. For example, a kidney is inside the abdominal cavity, but is retroperitoneal—located outside the peritoneum.
The peritoneum and the kidney: A sagittal section through the posterior abdominal wall, showing the kidney residing outside the peritoneum.

Although they ultimately form one continuous sheet, there are two layers of peritoneum and potential space between those layers.

- The outer layer, called the parietal peritoneum, is attached to the abdominal wall.
- The inner layer, the visceral peritoneum, is wrapped around the internal organs that are located inside the intraperitoneal cavity.
- The potential space between these two layers is the peritoneal cavity. It is filled with a small amount of slippery serous fluid that allows the two layers to slide freely over each other.

The term mesentery is often used to refer to a double layer of visceral peritoneum. There are generally blood vessels, nerves, and other structures between these layers. The space between the two layers is technically outside of the peritoneal sac, and thus not in the peritoneal cavity.

The Regions of the Peritoneum

There are two main regions of the peritoneum, connected by the epiploic foramen (also known as the omental foramen or foramen of Winslow). The first is the greater sac or general cavity of the abdomen. The second is the lesser sac or omental bursa.

The lesser sac is divided into two omenta: the gastrohepatic and the gastrocolic. The gastrohepatic omentum is
attached to the lesser curvature of the stomach and the liver. The gastrocolic omentum hangs from the greater curve of the stomach and loops down in front of the intestines before curving upwards to attach to the transverse colon. Like a curtain of tissue, it is draped in front of the intestines to insulate and protect them.

**Substructures of the peritoneum:** This is a midsagittal, cross-section drawing of the epiploic foramen, the greater sac or general cavity (red), and the lesser sac or omental bursa (blue).

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**Abdomen Structures**

The structures in the abdomen are classified as intraperitoneal, retroperitoneal, or infraperitoneal depending on whether they are covered with visceral peritoneum and are attached by mesenteries, such as the mesentery and mesocolon.

**Intraperitoneal Structures**

Intraperitoneal organs include the stomach, the first five centimeters and the fourth part of the duodenum, the jejunum, the ileum, the cecum, the appendix, the transverse colon, the sigmoid colon, and the upper third of the rectum.

Other organs located in the intraperitoneal space are the liver, spleen, and the tail of the pancreas. In women, the uterus, fallopian tubes, ovaries, and gonadal blood vessels are located in the intraperitoneum.

**Retroperitoneal Structures**

Retroperitoneal structures include the rest of the duodenum, the ascending colon, the descending colon, the middle third of the rectum, and the remainder of the pancreas. Other organs located in the retroperitoneal space are the kidneys, adrenal glands, proximal ureters, and renal vessels. Organs located below the peritoneum in the subperitoneal space include the lower third of the rectum and the urinary bladder.
Intraperitoneal Structures

Structures that are intraperitoneal are generally mobile, while those that are retroperitoneal are relatively fixed in their location. Some structures, such as the kidneys, are primarily retroperitoneal, while others such as the majority of the duodenum, are secondarily retroperitoneal, meaning that structure developed intraperitoneally, but lost its mesentery and thus became retroperitoneal.

Peritoneum: The peritoneum illustrated, indicated by blue.

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