Unit 24: Abdominal and Peritoneal Cavities

Dissection Instructions:

Without cutting any abdominal organs, make a vertical incision through the anterior body wall just to the left of the midline (feel for falciform ligament) from the xiphoid process to the symphysis pubis. The four flaps of body wall thus formed should be folded back to expose the abdominal contents.

In a normal individual, the entire anterior body wall should be free from the abdominal viscera except the liver, which is attached by the falciform ligament. The falciform ligament is a peritoneal fold which attaches to the abdominal wall from the umbilicus to the dome of the diaphragm. Its lower free margin contains the round ligament of the liver, a remnant of the fetal umbilical vein (Plates 279, 280; 2.18, 2.19, 2.49-2.51).

Below the right costal margin and xiphoid process one can see the lower margin of the liver (Plates 260, 278; 2.1A, 2.19). In the region where the lateral rectus line crosses the right ninth costal margin is the fundus of the gall bladder, unless it has been surgically removed. Below the lower liver margin and below the left costal margin is a portion of the body and greater curvature of the stomach. Attached to the greater curvature is the greater omentum, a peritoneal structure containing fat which hangs like an apron from the stomach covering the transverse colon and small intestine. If the cadaver is normal, the greater omentum should be attached to the stomach and transverse colon, but should be free from all other structures, including anterior body wall. Lift up the greater omentum and observe the rest of the intestine.

The falciform ligament consists of two layers of peritoneum with connective tissue, small vessels and the round ligament of the liver between them. Place your right hand to the cadaver's left of the falciform ligament and your left hand to the right of the ligament so that both hands are touching the ligament. Now pass your hands between the liver and diaphragm until your finger tips feel the two layers of peritoneum which form the falciform ligament separate from each other and extend transversely across the superior surface of the liver. When the two layers of peritoneum separate, they become the coronary ligament of the liver (Plates 279; 2.49, 2.50). Follow the coronary ligament laterally to its most lateral positions. The peritoneum is thickened here and forms the left and right triangular ligaments. Posterior to the triangular ligaments, the coronary ligament continues to the posterior surface of the liver and finally meets where the lesser omentum attaches to the liver. The lesser omentum is the peritoneal structure attached to the lesser curvature of the stomach and extending to the liver.

Explore the anterior surface of the stomach (Plates 67; 2.20). The esophagus passes through the diaphragm at approximately the level of the TV10 and joins the stomach at the level of the TV11. The part of the stomach which receives the esophagus is the cardiac portion of the stomach. The upward dome of the stomach is the fundus. In the standing position, the fundus is usually filled with air. There is usually a notch in the lesser curvature which indicates the beginning of the pyloric antrum of the stomach. The portion of the stomach between the fundus and antrum is the body of the stomach. Palpate the wall of the stomach from the body to the end of the pyloric antrum and notice the thickening of the wall which contains the pyloric sphincter.

Note that there is a space behind the stomach, lesser omentum and greater omentum. This is the omental bursa or lesser peritoneal sac (Plates 264-267; 2.21 - 2.25). Follow the lesser omentum to the right and find its free margin extending from the liver to the duodenum. Reach a finger behind the free margin of the lesser omentum and locate the epiploic foramen, the only entrance to the omental bursa. Feel the free margin between your finger and thumb and note that within this peritoneal structure are the portal vein, hepatic artery and common bile duct (Plates 280; 2.24, 2.25). The portal vein is the largest structure...
and is posterior in position. The hepatic artery is anterior and to the left while the common bile duct is anterior and to the right. Now concentrate on your finger in the epiplioic foramen. Immediately superior to your finger is the caudate lobe of the liver. Anterior to your finger is the portal vein in the margin of the lesser omentum. Inferior to your finger is the first part of the duodenum. Posterior to your finger is the inferior vena cava, which is covered by parietal peritoneum.

For descriptive purposes, the peritoneum can be considered to be of three kinds, based on position or relationships. The peritoneum which is directly on the wall of organs which have mesenteries is called visceral peritoneum. The peritoneum which lines the walls of the abdominal and pelvic cavities is called parietal peritoneum. The peritoneal structures which attach the organs to the wall are called mesenteries. Organs which have mesenteries are said to be intraperitoneal, although this is technically a misnomer. Some organs lie on the posterior body wall and are covered by parietal peritoneum. They are said to be retroperitoneal organs. In the early embryo, there was an incomplete ventral mesentery and a complete dorsal mesentery. These have persisted, but their attachments have changed because of rotation of some organs and fusion of other organs to the body wall. Specific portions of these mesenteries have been named.

The liver developed in the ventral mesentery and divided the mesentery into different parts. The part attached to the anterior body wall and part of the diaphragm is the falciform ligament (Plates 270; 2.22. The coronary and triangular ligaments are other parts. Within the boundaries formed by the coronary ligament, the liver and diaphragm are adjacent to each other without any intervening peritoneum (Plates 279; 2.49, 2.50). These areas of the liver and diaphragm are called bare areas. The lesser omentum makes up the remaining part of the original ventral mesentery. It can also be called the gastrohepatoduodenal ligament (Plates 267; 280; 2.20). Some authors describe a gastrohepatic ligament and a hepatoduodenal ligament. They are subdivisions of the lesser omentum. The portal vein can be said to be in the hepatoduodenal ligament.

As the various subdivisions of the gastrointestinal tract developed, each part was attached to the dorsal body wall by the dorsal mesentery. The part attaching the greater curvature of the stomach to the dorsal body wall was called the dorsal mesogastrium. Locate the portion of the mesentery which attaches the fundus of the stomach to the diaphragm. This is called the gastrophrenic ligament. The spleen developed in the dorsal mesogastrium. In the adult, the spleen is located posterior and lateral in the upper left region of the abdominal cavity. It overlies the left 9th, 10th and 11th ribs, but is separated from them by the diaphragm. Find the portion of the mesentery extending from the greater curvature of the stomach to the spleen. It is called the gastrolienal or gastrosplenic ligament (Plates 264, 265; 2.21A, 2.23, 2.51). Reach your right hand under the left rib cage and extend it between the spleen and diaphragm until you can hold the spleen in the palm of your hand. Now try to feel with your finger tips the part of the mesentery which extends from the spleen to the dorsal body wall. It should extend from the hilus of the spleen to the dorsal body wall over the left kidney. This portion of the mesentery is called the lienorenal ligament.

Continuing inferiorly, the dorsal mesentery of the stomach now passes from the greater curvature of the stomach to the transverse colon and is called the gastrocolic ligament (Plates 264, 265; 2.22). It is part of the greater omentum (Plates 261, 264, 267; 2.19, 2.20). When the dorsal mesogastrium grew so large that it hung down over the transverse colon, the portion that touched the transverse colon and its mesocolon fused to these structures.

Locate the blood vessels in the gastrocolic ligament which parallel the greater curvature of the stomach and lie about 15-20 mm from it (Plates 290, 291; 2.27A, 2.28). These are the right and left gastroepiploic vessels forming a continuous route for blood along the greater curvature. They give off branches to the stomach (gastric branches) and branches to the omentum (epiploic branches). Carefully cut through the gastrocolic ligament inferior to the gastroepiploic vessels and open the omental bursa. Place your hand in the omental bursa and explore the space (Plates 264-267; 2.23B, 2.24, 2.25). The space is limited
anteriorly by the lesser omentum, stomach and gastrocolic ligaments. Its posterior wall is the posterior body wall covered by parietal peritoneum overlying the diaphragm, aorta, left suprarenal gland, left kidney and pancreas. Inferiorly the transverse mesocolon also forms part of the posterior wall of the omental bursa. The left boundary is made up of the dorsal mesogastrium above the gastrocolic ligament. In the upper right portion of the omental bursa can be felt the caudate lobe of the liver.

The greater and lesser omenta to the right of the stomach attach to the first part of the duodenum, but the duodenum quickly becomes retroperitoneal. The duodenum consists of four parts; superior, descending, inferior or transverse and ascending (Plates 270, 271; 2.32, 2.37). Its second part overlies the hilus of the right kidney and is crossed by the transverse colon and transverse mesocolon. The first part of the duodenum is superior to the transverse mesocolon and the fourth part ends inferior to the transverse mesocolon. Locate the duodenojejunal flexure. Usually there are superior and inferior duodenal folds of peritoneum extending laterally from the flexure, forming fossae between the folds and body wall (Plates 262, 270; 2.63). These are sites where intraabdominal hernias can occur. Follow the coils of small intestine until you reach the ileocecal junction. The small intestine consists of three parts; duodenum, jejunum and ileum. The duodenum is only 10 or 12 inches long while the rest of the small intestine may be that many feet long. The upper two-fifths are considered jejunum and the last three-fifths is ileum. The transition is gradual and there is no specific location where the jejunum changes its name to ileum. The mesentery of the jejunum and ileum is simply called the mesentery proper.

The cecum is a blind pouch of large intestine inferior to the entrance of the ileum. Attached to it is the appendix, unless it has been removed. Most frequently, the appendix extends up behind the cecum. The appendix has its own mesentery, the mesoappendix, which contains its vascular supply. There may be addition peritoneal folds in the region of the ileocecal junction and cecum which form fossae (Plates 273; 2.65, 2.66). The ascending colon and descending colon are retroperitoneal, having fused to the dorsal body wall (Plates 270; 2.62). The extremities of the transverse colon which connect with the ascending and descending colons are called the right (hepatic) and left (splenic) colic flexures respectfully. In the left iliac fossa, the descending colon becomes the sigmoid colon, which has a mesentery. The attachment of the sigmoid mesocolon is variable, but it usually crosses from abdominal to pelvic cavities at the point where the ureter crosses the bifurcation of the common iliac artery.

The lower end of the abdominal aorta can usually be palpated (Plates 296; 2.47). It lies in front of the LV4 where it divides into left and right common iliac arteries.
Be sure to identify all of the following in this unit:

falciform ligament
round ligament of the liver
fundus of the gall bladder
greater curvature of the stomach
greater omentum
coronary ligament
left & right triangular ligaments
lesser omentum
stomach
cardiac portion of stomach
omental bursa/lesser sac
portal vein
hepatic artery
epiploic foramen
caudate lobe of liver
1st part of duodenum
inferior vena cava
peritoneum
visceral peritoneum
parietal peritoneum
mesenteries
liver
gastrohepatoduodenal ligament
gastrohepatic ligament
hepatoduodenal ligament
gastroplenic/gastolieneal ligament
lienorenal ligament
gastrocolic ligament
rt & lf gastroepiploic vessels
duodenum (all parts)
hilus of rt kidney
small intestine
duodenojejunal flexure
jejunum
ileum
ileocecal junction
cecum
appendix
mesoappendix
ascending colon
transverse colon
descending colon
right/hepatic colic flexure
left/splenic colic flexure
sigmoid colon
sigmoid mesocolon
abdominal aorta

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