UNIT 31: Intact Pelvis

Dissection Instructions:

Review the bony pelvis (Plates 240, 340-342; 3.1-3.3, Table 3.1 and figures-pp. 190 & 191).

Observe that the peritoneum which lined the abdominal cavity continues into the pelvis (Plates 347, 348-352; 3.13, 3.14, 3.28, 3.29). That area deep to the peritoneum and between the peritoneum and the body wall is the extraperitoneal space.

In the MALE pelvis, locate the urinary bladder behind the pubic bones and the sigmoid colon and rectum in front of the sacrum. Note that the peritoneum dips inferiorly between the bladder and rectum, forming the rectovesicle pouch, to the sides of the rectum are the pararectal fossae. (Plates 350; 3.8)

In the FEMALE pelvis, the uterus, uterine tubes and ovary are located between the urinary bladder and rectum. Note that the peritoneum dips inferiorly between the bladder and rectum, forming the rectovesicle pouch. The female presents a shallow uterovesicle fossa and a deep rectouterine pouch (of Douglas), also called the cul-de-sac (Plate 352, 354; 3.28). This extension of the peritoneal cavity reaches the wall of the vagina in the vicinity of the posterior fornx. The extension of the peritoneum lateral to the uterus is called the broad ligament (Plates 355, 356, 3.28-3.30, 3.32). Its upper border contains the uterine tube and suspended from its posterior surface is the ovary. The portion of the broad ligament above the ovary which supports the uterine tube is called the mesosalpinx (mesentery of the tube) (Plates 354, 356; 3.30, 3.32) and the portion that supports the ovary is the mesovarium (Plates 355, 356; 3.30, 3.32). The free border of the mesovarium medial to the ovary contains the ovarian ligament, a remnant of the embryonic gubernaculum. Lateral to the ovary, the mesovarium is thickened and extends to the pelvic brim. This is called the suspensory ligament of the ovary and contains the nerves, blood vessels, and lymphatics of the ovary (Plates 380; 3.28, 3.29). The portion of the broad ligament below the ovary and its mesentery is called the mesometrium. In the region of the cervix of the uterus, the broad ligament sends a fold of peritoneum posteriorly to the region of the rectum and sacrum. This is called the rectouterine fold or uterosacral fold (Plates 349; 3.28).

In BOTH SEXES starting in the mid-line of the sacral promontory and going clockwise around the pelvic brim, identify the various structures which enter or leave the pelvis (Plates 380, 381,383, 384; 2.76, 2.78, 3.19A&B 3.34, - Table 3.5 and figure-pp. 234 & 235, - Table 3.3 and figure-pp. 212 & 213). The median sacral artery should lie in the mid-line or slightly to the left. It was the continuation of the dorsal aorta in the embryo. The superior hypogastric plexus is also in the mid-line (Plates 390, 392; 3.23, 3.25, 3.39). The sympathetic trunk is on the anterolateral aspect of the body of the first sacral vertebra. The lumbar branch of the iliolumbar vessels cross the ala of the sacrum (Plate 247). The anterior primary ramus of L5 and fibers from L4 cross the pelvic brim to form the lumbosacral trunk of the sacral plexus (Plates 259; 3.24, 3.26). Anterior to this is the obturator nerve. The superior rectal vessels lie in the sigmoid mesocolon or the parietal peritoneum near the attachment of the sigmoid mesocolon. The sigmoid colon is variable where it enters the true pelvis. The internal iliac vessels enter the true pelvis anterior to the sacroiliac joint, as does the ureter (Plates 380, 382, 383; 3.19A&B, 3.31, 3.34). The ovarian vessels cross the external iliac vessels to enter the pelvis in the suspensory ligament (Plates 375; 3.45). Either the round ligament of the uterus or the ductus deferens crosses the pelvic brim in an anterolateral position (Plates 251-253, 349, 350, 381; 3.13, 3.19, 3.28). Anterior to that is a pubic branch of the inferior epigastric artery, which frequently is enlarged to become the abnormal obturator artery (Plates 252, 378; 3.20). The medial umbilical ligament was identified earlier as was...
the **median umbilical ligament** (Plates 253; 3.13B). When the bladder is full, its apex extends above the pelvic brim and may go as high as the umbilicus in older men with prostatic hypertrophy. When the bladder is empty, the median umbilical ligament passes through the pelvic inlet. When there is room in the pelvis, as there usually is, loops of small intestine will pass through the pelvic inlet. On the right side, the appendix frequently falls into the pelvis minor.

In **BOTH SEXES** leave a strip of peritoneum in the mid-line about 3 cm wide to hold the organs in place, but remove the peritoneum from the lateral aspects of the pelvis. Clean the **median umbilical ligament** proximally to the point where it is patent. The **superior vesicle arteries** are branches of this remnant of the umbilical artery of the fetus (Plates 380, 382, 383; 3.19B, Table 3.3 and figure-pp. 212 & 213, Table 3.5 and figure-pp. 234 & 235). Clean the vessel back to the internal iliac and preserve it. Reach in front of the bladder behind the pubic symphysis and explore the **retropubic space**.

**In the MALE**, the **puboprostatic ligaments** can be felt as strong paired structures near the inferior aspect of the symphysis pubis. The **pubovesicle ligaments** in the female are not usually as strong. The **pelvic plexus of nerves and vessels** lie on the lateral sides of the pelvic organs (Plate 385). As the organs are explored, do not destroy the plexuses. Locate the point at which the ureters enter the bladder posteriorly (Plates 348, 367, 390; 3.13, 3.14A&B, 3.15, 3.19A&B, 3.35B). The **inferior vesicle artery** supplies the base of the bladder. It should be found and preserved. In **the FEMALE**, the base of the bladder may be supplied from a vaginal artery. In **the MALE**, the **ductus deferens** crosses superior to the ureter and then medial to the seminal vesicles, where it enlarges to form an **ampulla** (Plates 367; 3.14, 3.15). Locate the **seminal vesicle** and the union of it with the ductus deferens to form the **ejaculatory duct** immediately superior to the prostate (Plates 362, 3.24, 3.28). Palpate the extent of the **prostate** and feel where the **urethra** pierces the pelvic diaphragm after exiting the prostate.

**In the FEMALE** the **ureter** passes immediately under the **uterine artery** one or two cm superior and lateral to the lateral fornix of the vagina (Plates 351, 354; 3.29, 3.34, 3.35, 3.41). Locate and clean the uterine artery and clean the ureter back to the abdominal cavity. The uterine artery and ureters cross in connective tissue the **transverse cervical ligament/cardinal ligament of the uterus** (Plates 351, 354; 3.31, 3.35). Follow the **ovarian artery** to the ovary and look for branches which supply the uterine tube and anastomose with the superior branch of the uterine artery (Plates 349, 351, 381, 392; 3.31, 3.34, 3.35). The portion of the **uterus** above the uterine tubes is the **fundus** Below this level is the body of the uterus, which narrows below to become the cervix (Plates 355, 356; 3.30). Follow the **vagina** down to where it passes through the **pelvic diaphragm**. Note its relationship to the urethra and urinary bladder.

The sigmoid colon ends and the rectum begins in front of the third sacral vertebra. Follow the rectum down to where it passes through the pelvic. As previously seen revisit the **rectovesicle pouch in the male** between the rectum and the base of the bladder Plates 350; 3.8). Revisit the **rectouterine pouch (of Douglas) in the female** (Plate 352, 354; 3.28). Also revisit the **pararectal fossae**.

The **rectum** lacks the three characteristics of the large intestine which distinguished it from the small intestine. At its beginning, the rectum has peritoneum on its anterior and lateral surfaces (Plates 348; 3.8, 3.14C, 3.27, 3.28). A little lower, it has peritoneum only on its anterior surface. The lower part of the rectum has no peritoneum. Clean the **superior and middle rectal arteries** (Plates 378; 3.10, Table 3.3 and figure-pp. 212 & 213, Table 3.5 and figure-p. 234 7 235). The superior hypogastric plexus divides and passes on each side of the rectum to form the **inferior hypogastric or pelvic plexus** (Plates 390, 392; 3.11, 3.25, 3.39). It receives **sacral splanchnic nerves** from the sympathetic trunk and pelvic splanchnic nerves directly from S2,3, 4 spinal nerves.
**In BOTH SEXES** clean the internal iliac artery and attempt to identify all its branches (Plates 380, 382, 384; 3.31, Table 3.5 and figure-pp. 234 & 235, - 381, 383; 3.19A&B, Table 3.3 and figure-pp. 212 and 213; Table 3.5-pp. 234 & 235). It usually divides into anterior and posterior divisions. The posterior division has only branches which leave the pelvis. The first branch is usually the iliolumbar artery which helps supply the iliacus and psoas muscles through the iliac and lumbar branches. One or more lateral sacral branches pass medially to enter the anterior sacral foramina. The largest branch of the internal iliac is the superior gluteal artery, which usually passes between the lumbosacral trunk and first sacral nerve to get to the gluteal region through the greater sciatic foramen. Occasionally the obturator and inferior gluteal arteries will also branch from the posterior division. The anterior division gives off the original umbilical artery which now is only patent to the superior vesicle branches. The obturator artery is usually an early branch of the anterior division. The uterine, inferior vesicle and/or vaginal arteries pass medially to their respective organs. The middle rectal artery usually lies on the pelvic diaphragm and may branch from one of the terminal branches of the anterior division or from the inferior vesicle or vaginal arteries. The internal pudendal artery is anterior to the inferior gluteal artery when they leave the pelvis through the inferior aspect of the greater sciatic foramen. If the pelvic organs are enlarged, the lower branches of the internal iliac artery may not be accessible for demonstration at this time.

Note the obturator canal where the obturator nerve and vessels exit the pelvis and clean the obturator fascia which covers the obturator internus muscles. About half-way down the pelvic wall, the obturator fascia is thickened to form the arcus tendinous, which serves as origin for much of the pelvic diaphragm. The pelvic diaphragm consists of several components (Plates 344, 345; 3.4-3.6, 3.24, Table 3.2 and figures-p.193). Its most medial and anterior fibers arise from the inner surface of the pubis and pass backwards until they are past the lower end of the rectum. Here some of the fibers decussate behind the rectum. These fibers are sometimes called the puborectalis muscle, but they are a part of the pubococcygeous muscle. It also attaches to the anococcygeal ligament and the coccyx. The portion of the pelvic diaphragm arising from the arcus tendinous is called the iliococcygeous muscle. The combined pubococcygeous and iliococcygeous muscles is called the levator ani muscle. The final part of the pelvic diaphragm arises from the ischial spine and inserts on the side of the coccyx and lower sacrum. It is called the coccygeous muscle. Its action is to wag the tail, an action which is lost, and most of the fibers of this muscle have been replaced by collagen fibers to form the sacrospinous ligament. Since the pelvic diaphragm is a continuous structure, the arcus tendinous extends from the pubic bone to the ischial spine.
Be sure to identify all of the following in this unit:

prostatic urethra
membranous urethra
spongy/penile urethra
urethral crest
colliculus seminalis
urethral sulci
bulb of penis
corpus spongiosum
glans penis
navicular fossa
bladder
ureters
interuretereric crest
uvula
bladder trigone
prostate gland
urinary bladder
bladder trigone
ureters
vagina
cervix of uterus
fornix
uterine cavity
vaginal cavity
cervix
cervical canal
external os
internal os
anal canal
external anal sphincter
internal anal sphincter
anal columns
anal sulci/sinus
pectinate line
inferior hypogastric plexus
lumbosacral trunk
piriformis muscle
ischiorectal fossa
pubian nerve
internal pudendal artery
pubian canal
lesser sciatic foramen
transversalis fascia
endopelvic fascia
sigmoid colon
rectovesicle pouch
pararectal fossae
uterus
uterine tube
ovary

uterovesicle fossa
rectouterine pouch
broad ligament
mesosalpinx
prostate
urethra
ureter
uterine artery
vaginal artery
ovidian artery
uterus
fundus
body
vagina
ovidian ligament
suspensory ligament of ovari
mesometrium
rectouterine fold
sacral promontory
median sacral artery
superior hypogastric plexus
sympathetic trunk
iliolumbar vessels
lumbosacral trunk
obturator nerve
superior rectal vessels
sigmoid mesocolon
external iliac vessels
round ligament of uterus/ductus deferens
inferior epigastric artery