

Answers - Part I + II

EXAM NUMBER _____

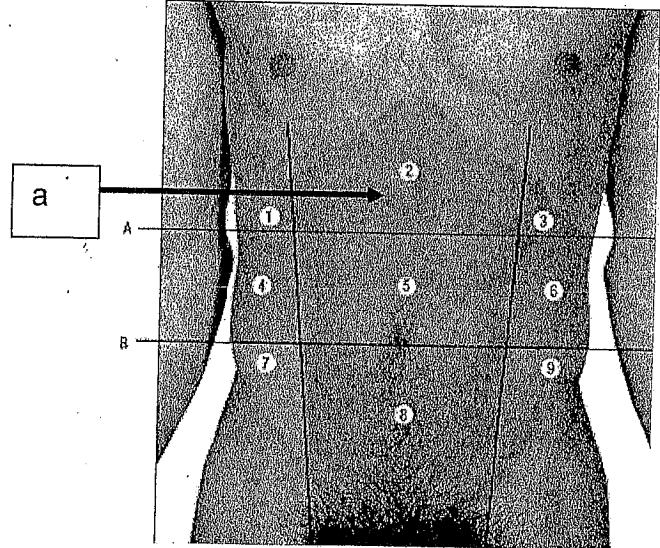
**STRUCTURAL BASIS OF MEDICAL PRACTICE
EXAMINATION 3**

September 17, 2009

PART I. Answer in the space provided. (7 pts)

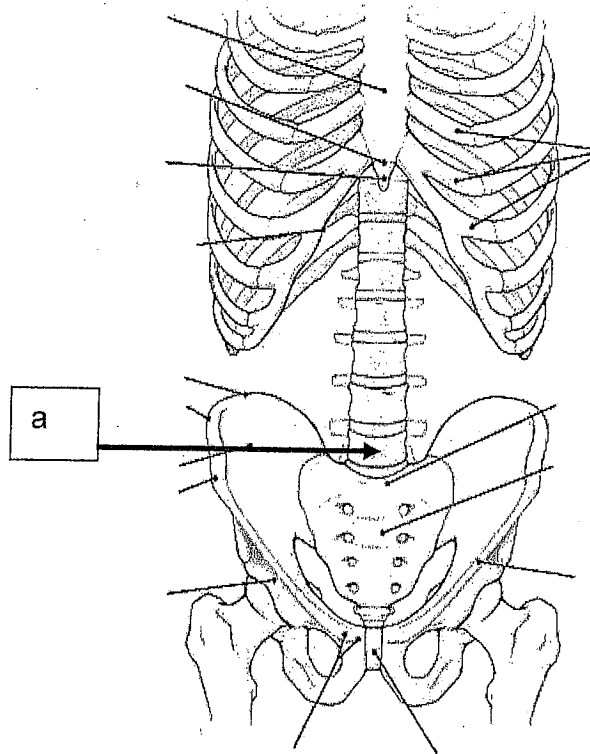
1. Identify the region. (0.5 pt)

a. Epigastric



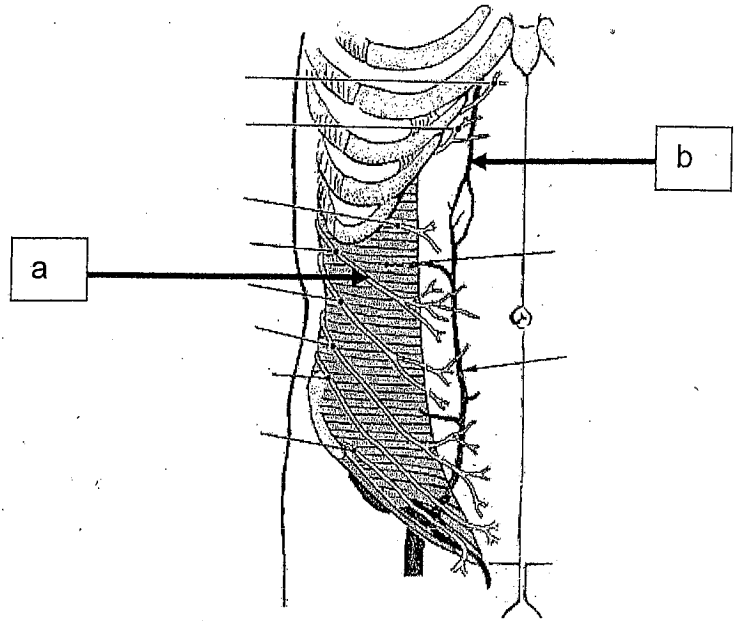
2. Identify the structure. (0.5 pt)

a. L5



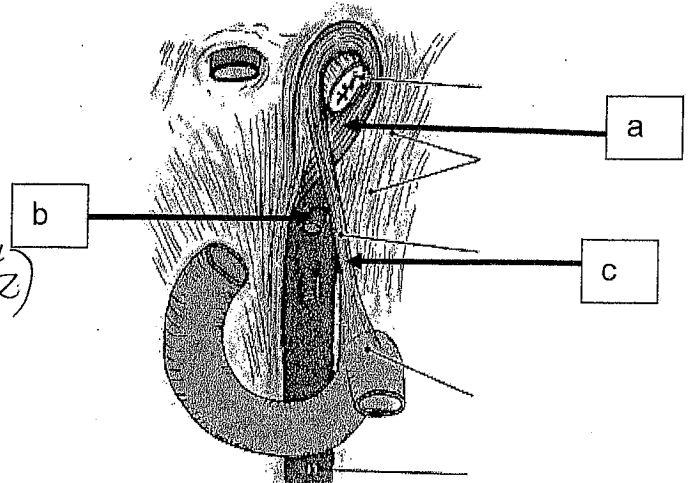
3. Identify the structures. (1 pt)

- a. T10
- b. Superior Epigastric



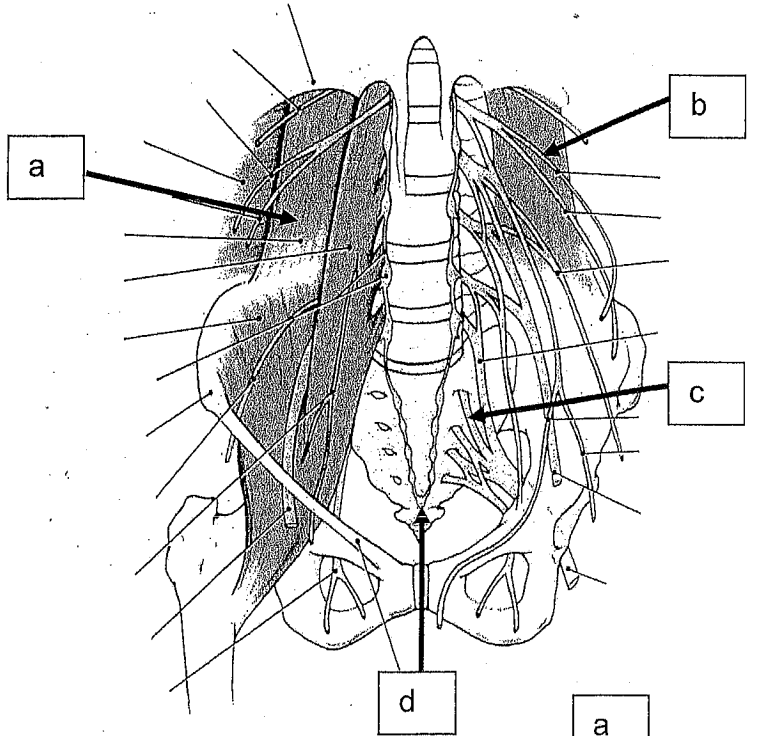
4. Identify the structures. (1.5 pts)

- a. Right crus
- b. Celiac Artery
- c. Suspensory Ligament (of Krütz)



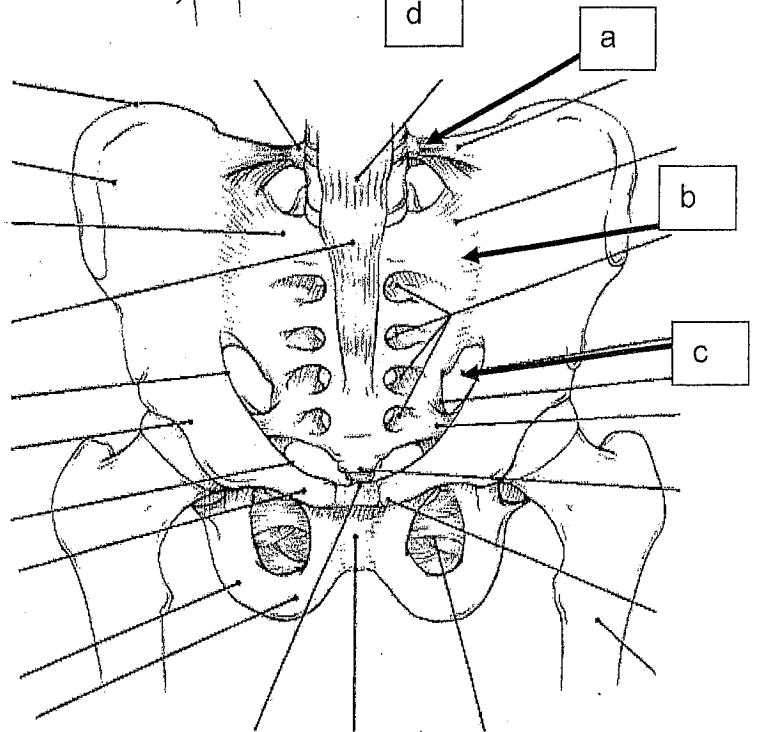
5. Identify the structures. (2 pts)

- a. Quadratus Lumborum
- b. Iliohypogastric Nerve
- c. S1
- d. Ganglion Impare



6. Identify the structure. (1.5 pts)

- a. Iliolumbar Ligament
- b. Ant. Sacrotuber Ligament
- c. Greater Sciatic Foramen



Part II. Circle the correct answer. All, none, or some may apply. (27 pts)

1. In regard to the abdominal vasculature, organs, and nerves:

- a. The left gastric artery courses through the lesser omentum.
- b. The superior mesenteric ganglion is located at the level of L3
- c. The gastroduodenal artery contributes blood to the marginal artery.
- d. The short gastric arteries are located in the gastrosplenic ligament.
- e. The dorsal pancreatic artery descends posterior to the neck of the pancreas.
- f. The superior mesenteric vein lies posterior to the tail of the pancreas.
- g. The vasa recta in the jejunum are longer than that in the ileum.
- h. The superior rectal artery lies between the peritoneum and the tela subcutanea in the transversalis fascia.
- i. The cystic artery is embedded in extraperitoneal connective tissue.
- j. The inferior mesenteric artery passes inferiorly to the left of the aorta.
- k. The diameter of the ileum is smaller than that of the jejunum.
- l. The superior mesenteric artery is inferior to the first lumbar artery.
- m. The left lateral (paracolic) gutter lies to the left of the descending colon and is closed cranially by the phrenicocolic ligament.
- n. Derivatives of the foregut are supplied by the celiac artery, and innervated by the lumbar and pelvic splanchnic nerves.

2. With respect to the liver, duodenum, and pancreas:

- a. The ligamentum venosum lies adjacent to the quadrate lobe of the liver
- b. The left triangular ligament is a derivative of the dorsal mesentery.
- c. According to the internal morphology of the liver, the quadrate lobe and part of the caudate lobe belong to a larger left lobe.
- d. Plicae circulares are not present in the 1st part of the duodenum.
- e. The hepatic veins drain into the portal vein.

- f. The second part of the duodenum is crossed by the transverse colon.
- g. The root of the mesentery begins at the duodenojejunal flexure.
- h. The greater duodenal papilla lies inferior to the lesser duodenal papilla.
 - i. The tail of the pancreas lies in the gastrolial ligament.
 - j. The phrenicocolic ligament forms a shelf for the spleen and is derived from ventral mesentery.

3. With respect to the abdominal wall:

- a. Tendinous intersections of the rectus abdominis muscle are adherent to the anterior layer of the rectus sheath.
- b. The external oblique muscle arises from the lower 8 ribs, thoracolumbar fascia, and the lateral two-thirds of the inguinal ligament.
- c. Nerves and vasculature of the anterior abdominal wall travel in the neurovascular plane, located between the external oblique and transversus abdominis muscles.
- d. The lacunar ligament is derived from fibers of the inguinal ligament that attach to the pecten pubis.
- e. Inferior to the arcuate line the extraperitoneal connective tissue lies immediately adjacent to the transversalis fascia.
 - f. The suspensory ligament of the penis is derived from the tela subcutanea.
 - g. The conjoint tendon (falx inguinalis) is formed by fibers of the internal oblique and transversus abdominis muscles.
 - h. The cremaster muscle is innervated by the genital branch of the ilioinguinal nerve.
 - i. The scrotal ligament, round ligament (ligamentum teres), and ovarian ligament are derivatives of the gubernaculum.
 - j. The subcostal nerve serves as part of the innervation of the rectus abdominis, internal oblique, and external oblique muscles.

4. In regard to the kidneys and pelvis:

- a. The renal fascia is a derivative of the extraperitoneal connective tissue.
- b. The puborectalis muscle arises from the pubic bone and inserts on to the anococcygeal raphe.

- c. The transversalis fascia in the ischiorectal fossa is termed parietal pelvic fascia.
 - d. The arcus tendineus serves as the origin of the iliococcygeus muscle and is derived from a condensation of the visceral pelvic fascia from the obturator muscle.
 - e. The uterosacral ligaments in the female are derived as condensation of the visceral pelvic fascia.
 - f. The coccygeus (ischiococcygeus) is a skeletal muscle.
 - g. The lumbar splanchnic nerves lie lateral to the quadratus lumborum.
 - h. The superior fascia of the pelvic diaphragm is a condensation of the visceral pelvic fascia.
 - i. The inferior gluteal artery courses superior to the upper border of the coccygeus muscle.
 - j. The deep dorsal vein of the penis lies deep to Buck's fascia on the dorsal surface of the corpora cavernosa penis.
5. "This and that":
- a. The left hypogastric nerve contains postganglionic neurons of the pelvic splanchnic nerves.
 - b. The suspensory ligament of the ovary contains the ovarian artery.
 - c. The greater vestibular glands in the female reside in the superficial pouch/space.
 - d. Extravasation of urine into the deep pouch by damage of the membranous urethra and superior fascia of the U.G. diaphragm can reside in the ischiorectal fossa.
 - e. The cisterna chyli is located at the level of the second lumbar vertebrae.
 - f. The parietal layer of the tunica vaginalis is a continuation of the transversalis fascia into the scrotum.
 - g. The appendix contains 3 distinct taenia coli.
 - h. Meckel's diverticulum is an occasional feature of the ileum.
 - i. The obliterated umbilical veins in the adult are termed medial umbilical ligaments.
 - j. Transection above S2-4 results in an autonomous bladder.

Lymphatic drainage of the ovary

- 3 Pathways of lymphatic drainage of the ovary:
 - Lymph drainage is **primarily** along the embryological descent of the ovary. Lymphatic vessels follow ovarian vessels to upper lumbar nodes (aka para-aortic) in the vicinity of the renal arteries.
 - Drainage may also follow the uterine artery to pelvic nodes or internal iliac nodes
 - These pass lymph into lower para-aortic nodes.
 - Less often drainage follows the round ligament to the inguinal nodes.
 - Inguinal nodes pass to external and common iliac nodes
 - These drain into the para-aortic nodes
- Para-aortic nodes drain into two lumbar lymph trunks, which terminate in the confluence of lymph trunks (cysterna chyli).
- Cysterna chyli is a saccular dilation of the inferior end of the thoracic duct.
- Thoracic duct ascends through diaphragm (aortic hiatus), and ends by opening into the junction of the left subclavian and internal jugular veins.

Deep Pouch/Space Answer Sheet

- Between UG diaphragm and perineal membrane or Superior and Inferior fascia of UG diaphragm
- Contains the urethra (membranous in males) and external urethral sphincter
- Bounded superiorly by endopelvic fascia of pelvic floor (parietal pelvic fascia) +1
- Superficial- perineal membrane
- Between facial layers lie deep transverse perineal muscles, superficial to urethral sphincter and pubourethralis
- In females, compressor urethrae and sphincter urethrovaginalis

- **Perineal membrane** is a triangular membrane which stretches across the deep perineal pouch
 - Attached laterally to the periosteum of the ischiopubic rami and arcuate ligament of the pubis
 - Called the transverse perineal ligament in the area of the pubis
 - Posteriorly, fused with deep part of the perineal body and is continuous with fascia over deep transverse perineal muscles

- **In the male**, perineal membrane is crossed by urethra, vessels and nerves to the bulb of the penis, ducts of the bulbourethral glands (posterolateral to urethral orifice)
- **In the female**, the perineal membrane is less defined
 - Divided into halves by vagina and urethra
 - Pubourethral ligament (transverse perineal ligament) links the sides of the triangle behind pubic arch
 - Crossed by urethra (inferior border of pubic symphysis), vagina (centrally), Deep dorsal vessels and dorsal nerves of the clitoris (behind pubic arch midline), posterior labial vessels and nerves anterior to transverse perineal muscles

- **Female Deep Perineal Pouch:**
 - Contents: urethra, portion of vagina, external urethral sphincter muscle, branches of internal pudendal vessels, and branches of pudendal nerve, deep transverse perineal muscles (attaches laterally to ischial tuberosity and ischio pubic ramus and medially to perineal body)

- **Male Deep Perineal Pouch:**
 - Contents: membranous urethra, external urethral sphincter, bulbourethral glands, branches of internal pudendal artery and pudendal nerve, Deep transverse perineal muscle

Transverse Perineal Ligament

- Associated with the superior and inferior fascia of the Urogenital diaphragm. They blend together at the anterior margin of the U.G. diaphragm to form a ligament between the conjoint rami of the ischium and pubis. It is the inferior border of a gap which transmits either the deep dorsal vein of the penis or clitoris as it travels from the pelvis to the perineum. The structure arches superiorly over the sphincter urethrae.

Nerves-

- Superficial perineal nerve- posterior scrotal (labial)
- Deep perineal nerve-pierces superficial fascia to enter superficial pouch innervating muscles in deep and superficial pouches
- Dorsal nerve of penis or clitoris runs along conjoint ramus within anterior recess of ischiorectal fossa to pierce transverse perineal ligament to enter dorsum of penis or clitoris

Blood Supply-

- Deep artery from internal pudendal artery pierces superior fascia of UG diaphragm to enter deep pouch- pierces inferior fascia of UG diaphragm at tunica albuginea of crus
- Dorsal artery of penis or clitoris- pierces transverse perineal ligament lateral to vein and medial to dorsal nerve
- Deep perineal artery- pierces superficial perineal fascia to enter superficial pouch to muscles within deep pouch
- Deep dorsal vessels and nerves behind pubic arch in the midline
- Posterior scrotal vessels and nerves anterior to transverse perineal muscles

Vascular supply of the Suprarenal Gland

THREE ARTERIES: superior, middle and inferior suprarenal; ONE VEIN: Suprarenal Vein

Very vascular, arterial branches form a subcapsular plexus

Superior Suprarenal Artery: arises from the inferior phrenic artery, which is a branch from the abdominal aorta.

Middle Suprarenal Artery: arises from the lateral aspect of the abdominal aorta, level with the superior mesenteric artery. It ascends slightly and runs over the crura of the diaphragm to the suprarenal glands, where it anastomoses with the suprarenal branches of the phrenic and renal arteries. The right middle suprarenal artery passes behind the IVC and near the right celiac ganglion. The left middle supra renal artery passes close to the left celiac ganglion, splenic artery and superior boarder of the pancreas.

Inferior Suprarenal Artery: arises from the renal artery

SUPRARENAL VEIN: right drains directly horizontally into the posterior IVC at the level of the 12 thoracic vertebra; it's usually very short. Left vein descends medially, anterior and lateral to the left celiac ganglion, passes posterior to the pancreatic body and drains into the left renal vein.

Inferior phrenic veins run on the inferior surface of the central tendon of the diaphragm. They drain into the posterolateral aspect of the IVC at around the 10th thoracic vertebra. The left vein tends to drain at a slightly higher level of the esophageal opening in the diaphragm it may be doubled with a branch draining into the left renal/suprarenal.

LYMPHATICS: small lymph channels from the medulla and the cortex drain to the hilum (around the suprarenal vein) where larger lymphatic vessels drain directly in to the upper lateral group of para-aortic nodes. These drain to the two lumbar lymph trunks which terminate in the confluence of lymph trunks (cisterna chyli)

Exam 3 – Sept. 17, 2009

4. Boundaries of Scarpa's fascia. (6 points)

Superior: Level of umbilicus

Abdomen:

Ant.: Camper's fascia

Post.: Deep fascia of external oblique / ant. rectus sheath

Med.: Linea alba

Lat.: Thoracolumbar fascia @ midaxillary line

Inf.: See thigh / perineum

Thigh: Continuous superiorly with Scarpa's fascia in abdomen

Inf.: ~2cm inf. to inguinal ligament, blends with fascia lata

Perineum:

Continues as Colle's fascia to surround penis (excluding glans)

Continues as Dartos tunic in scrotum, superficial to external spermatic fascia

Continues posterolaterally to ischiopubic rami and posteriorly to attach to posterior free edge of UG diaphragm

Answer Guide for the Abdomen, Pelvis, and Perineum Essay Examination - September 17, 2009

Note. The following is a guide to answering the questions and is not the "answer."

Diaphragm - September 17, 2009

Review the anatomy of the diaphragm including the parts of the diaphragm, apertures, pathways of structures coursing between the thorax and abdomen, vasculature, fascia, lymphatic drainage, relationships, and innervation. (12 pts)

General Comments

- Separates the abdomen from the thorax
- Convex toward the thorax
- 10 cm movement with maximum inspiration
- right dome at 6th costochondral joint level on expiration
- Left dome one rib lower than right
- central tendon is thin aponeurosis of trifoliate shape
- cura origin blends with the anterior longitudinal ligament

Parts of the diaphragm

- central tendon - central aspect of diaphragm
- tendinous site of attachment for coronary ligament (and pericardial sac)
- sternal portion - xiphoid process upward and backward to central tendon
- costal portion - inner surface of costal cartilages 7, 8, 9 bony 10, 11, 12
- lumbar portion - from the arcuate ligaments and lumbar vertebrae by way of the cura
- domed peripheral muscular part
- right crus of diaphragm
 - contributes to esophageal hiatus
 - inferior insertion extends to L3 anterior vertebral body
- left crus of diaphragm
 - inferior insertion extends to L2
- median arcuate ligament
 - fibrous ligamentous arch connecting diaphragmatic cura
 - forms anterior boundary of aortic hiatus
- medial arcuate ligament
 - posterior attachment of diaphragm to fascia of psoas major
 - vertebral level L1/L2
- lateral arcuate ligament
 - posterior attachment of diaphragm to fascia of quadratus lumborum
 - attachment to anterior aspect of the transverse process of L1
 - attachment to the mid-12th rib
 - vertebral level L1/L2
- lumbocostal trigone (arch) (Bochdalek's triangle) (vertebrocostal trigone)
 - thinning of muscle usually on the left and immediately superior to the lateral arcuate ligament
 - site of herniation
 - surgically at risk during renal surgery

Apertures

- aperture for the IVC (inferior vena cava) at vertebral level T8 * transmits the IVC and branches of the right phrenic nerve
- aperture for the esophagus (esophageal hiatus) at vertebral level T10
 - encloses by insertion of right crus into central tendon
 - phrenoesophageal ligament (transversalis fascia) seals between cavities
 - transmits the esophagus, anterior and posterior vagal nerve trunks, esophageal branches of the left gastric vessels
- aperture for the aorta (aortal hiatus) at vertebral level T12
 - boundaries - anterior is median arcuate ligament, lateral left is left crus, lateral right is right crus, posterior is the vertebral body of T12 and the anterior longitudinal ligament
 - transmits aorta, thoracic duct, lymph ducts, azygos vein, hemiazygos vein, ascending lumbar vein

Pathways of structures coursing between thorax and abdomen

- IVC enters abdomen through hiatus for IVC
 - branch of phrenic n.
- esophagus enters abdomen through esophageal hiatus at T10
 - anterior and posterior vagal nerves
 - esophageal a. v. from left gastric a. v.

- aorta enters abdomen through aortic hiatus at T12
 - thoracic duct
 - ascending lumbar veins or azygos v.
- piercing the crura of diaphragm
 - greater, lesser, least splanchnic nn
- medial to the medial arcuate ligament
 - sympathetic trunk and psoas major
- posterior to the lateral arcuate ligament
 - subcostal nerve and quadratus lumborum
- anterior diaphragm is pierced by superior epigastric vessels

Relations (limited to abdomen) - consider that the diaphragm is domed shaped

- Anterior aspect of diaphragm - right side
 - posterior lies the liver, gall bladder, and duodenal cap
- anterior diaphragm - left side
 - posterior - greater sac, lesser omentum, stomach, greater omentum, transverse colon
- superior diaphragm - right side
 - inferior - liver, IVC
- superior diaphragm - left side
 - inferior - aorta, stomach, and spleen
- posterior diaphragm - right side
 - anterior - left kidney and suprarenal g. and the liver
 - lateral - greater, lesser, least splanchnic nerves, celiac and superior mesenteric ganglia lie of the crura
- posterior diaphragm - left side
 - anterior - pancreas, duodenum, stomach, transverse colon, spleen, kidney and suprarenal g., lesser sac
- much of the inferior diaphragm is covered with peritoneum
 - the resulting peritoneal spaces between diaphragm and liver, stomach, and spleen are the subphrenic recess
- ligaments
 - coronary ligament
 - leiorenal ligament
 - suspensory ligament of the duodenum
 - phrenicocolic ligament

Vasculature and Lymphatic Drainage

- anterior peripheral by musculocutaneous a. v. and anterior intercostal a. v.
- posterior peripheral by posterior intercostal a. v.
- pericardiophrenic vessels
- superior phrenic a. v.
- inferior phrenic a. v. - central tendon
 - right vein drains into IVC whereas the left drains into the left renal vein
- parasternal nodes
- posterior mediastinal nodes
- lumbar nodes

Innervation

- motor supply entirely by phrenic nerve
- peripheral sensory by intercostal n.
- central tendon motor and sensory by phrenic n.

 [Top](#)

Rectum and Anal Canal - September 17, 2009

Review the anatomy of the rectum and anal canal. Include peritoneal relationships, vasculature, lymphatic drainage, innervation, and relationships to surrounding structures and spaces. (12 pts)

General Anatomy of the Rectum

- rectosigmoidal junction at S3 extending to tip of coccyx and ending at anorectal junction (pelvic floor)
- ends 2cm anterior and slightly inferior to the tip of the coccyx
- passes through pelvic diaphragm before anorectal junction
- 12 cm long with two convexities to right and one to left
- transverse folds - two on the right and one on the left (this is variable)
- tenia coli broaden to form longitudinal muscle layer
- no haustra or appendices epiploica
- smooth mucosa
- distensible at the rectal ampulla

Peritoneal coverings and relations

- upper 1/3 covered anterior and lateral
- middle 1/3 covered anterior
- lower 1/3 not peritonealized
- peritoneal pouches and fossa
- ant: rectouterine or rectovesical pouch
- lateral: pararectal fossae

Relations to surrounding structures

- Anterior - bladder, vagina, uterus, prostate, seminal vesical, vasdeferens, ureters
- Posterior - presacral space, sacrum, sacral foramina, sacral plexus, sacral sympathetic trunk, piriformis, middle and lateral sacral arteries
- lateral (left and right) - inferior hypogastric plexus, pelvic wall and associated structures, appendix on right
- Superior - sigmoid colon, false pelvis
- Inferior - anal canal, pelvic floor

Ligaments and support

- Rectovesical - part of the pubosacral ligamentous complex (derived from pelvic visceral fascia)
- Rectosacral - part of the pubosacral ligamentous complex (derived from pelvic visceral fascia)

Innervation (no somatic for rectum proper)

- sympathetic - inhibitory to muscles of the rectal wall
 - Preganglionic: IMLL L1-3 - white rami - lumbar sympathetic trunk - lumbar splanchnics - aortic plexus - inferior mesenteric ganglion
 - Postganglionic: inferior mesenteric plexus - superior rectal aa, right and left hypogastric nerves to rectal plexus
- parasympathetic - relax internal anal sphincter, glandular secretion
 - Preganglionic: pelvic splanchnic nerves leave ventral rami of S2-4 spinal nerves to enter the pelvic plexus on either side of the rectum (inferior hypogastric plexus)
 - an extension of the pelvic plexus either independently or via the left hypogastric nerve contributes to rectal plexus
 - postganglionic: cell bodies and fibers are located in enteric (intrinsic) ganglia
- Visceral afferent fibers
 - low threshold (homeostatic) follow parasympathetic pathways
 - high threshold (pain) follow sympathetic pathways

Vasculature Supply

- superior rectal aa pair on lateral posterior rectum - derived from single continuation of inferior mesenteric a - provides superior aspect of rectum
- superior rectal vein - drains most of the entire venous plexus of the rectum
- middle rectal artery - from internal iliac - provides inferior aspect of rectum
- inferior rectal artery - from pudendal artery - anastomosis with middle rectal artery
- median sacral artery at the posterior aspect of the anorectal junction
- rectal venous plexus drains to prostatic plexus or uterovaginal plexus
- inferior rectal and superior rectal veins form an interface between caval and portal drainages
- epipectal lymph nodes drain superior toward upper lumbar nodes near the inferior mesenteric nodes
- pararectal nodes drain laterally into internal iliac nodes

General Anatomy of the Anal Canal

- begins at anorectal junction and ends at anal verge
- 2.5 - 5 cm long
- anterior flexion by puborectal sling (puborectalis)
- transition from cuboidal to squamous epithelium at the dentate line
- layers - inner epithelium, vascular subepithelium, internal anal sphincter, external anal sphincter, fibromuscular support tissue
- anterior attachment to perineal body
- posterior attachment to anococcygeal raphe
- surrounded by ischioanal fat
- rectal circular muscle becomes internal anal sphincter
- puborectalis is continuous with external anal sphincter
- anal columns end at anal valves
- anal valves and sinuses mark the dentate line and the anorectal junction
- stratified squamous epithelium inferior to dentate line
- stratified columnar epithelium superior to dentate line
- anal transition zone (ATZ) not same as dentate line but may include it
- haemorrhoids of the anal cushions are superior to dentate line and may reflect portal hypertension

Innervation of the Anal Canal

- distal to dentate line
 - somatic motor and sensory by pudendal nerve
 - defined pain

- proximal to dentate line
 - visceromotor by autonomic nervous system (see above for rectum)
 - visceral afferent follow autonomic pathways (see above for rectum)
 - "dull ache"
- external anal sphincter by inferior rectal branches of the pudendal nerve
- internal anal sphincter by autonomic nerves

Vasculature of the Anal Canal

- proximal - superior rectal artery/vein and median sacral artery/vein
- distal - inferior rectal artery/vein from the Internal pudendal artery/vein
- proximal lymphatic drainage - upper lumbar nodes
- distal lymphatic drainage - superficial inguinal nodes and internal iliac nodes

 [Top](#)

Spermatic Cord and Indirect Inguinal Hernia - September 17, 2009

Review the anatomy of the spermatic cord. Include contents, coverings, fascial boundaries, innervation, vasculature, lymphatics, and relationships. Discuss the pathway and location of an indirect inguinal hernia that has descended into the scrotum. (12 pts)

General Comments

- The spermatic cord is the pedicle of testis. Beginning at the deep ring, the spermatic cord transmits the contents of the deep ring from the abdominopelvic cavity to the scrotum.
- The pathway from the deep ring to the scrotum marks the "descent" of the testis.
- A peritonealized surface of the testis causes a trailing diverticulum known as the processes vaginalis.
- Applied to the anterior aspect of the testis is the visceral layer of tunica vaginalis.
- The deep ring marks the beginning of the inguinal canal and is located: at the midinguinal point; lateral to the inferior epigastric artery; and slightly more than 1 cm superior to the inguinal ligament.
- At the deep ring the spermatic cord receives the internal spermatic fascia derived from transversalis fascia. Within the inguinal canal the internal oblique contributes the cremasteric fascia.
- The cord exits the inguinal canal by way of the superficial ring.
- The superficial ring, a defect in the external oblique aponeurosis, contributes the external spermatic fascia.
- The testis, at the distal extent of the cord, ultimately resides within the scrotum. It is tethered to the most inferior aspect of the scrotum by the scrotal ligament.
- The external spermatic fascia (deep fascia) is opposed to dartos fascia (superficial fascia).

Internal Spermatic Fascia. Structures that pass through the deep ring were retroperitoneal and reside within the internal spermatic fascia derived from transversalis fascia.

- processes vaginalis - a trailing diverticulum of peritoneum that accompanies the testis during the "descent."
- Distally, within the scrotum, the processes vaginalis opens into the tunica vaginalis
- Extraperitoneal connective tissue
- Testicular artery - paired branches from lumbar aorta near renal arteries
- Testicular vein - proximally the testicular vein consists of 3-4 veins
- Distally the testicular surrounds the testicular artery forming the pampiniform plexus numbering 10 to 12 veins
- Left testicular vein drains into left renal vein and the right testicular vein drains into the IVC near the renal artery
- Testicular lymphatics - provide drainage to upper lumbar nodes, to lumbar lymph ducts, to cisterna chyli
- Testicular autonomic plexus - sympathetic preganglionic cell bodies in IMLCC T10(11-12)
 - Sympathetic postganglionic cell bodies in superior mesenteric ganglion
 - Parasympathetic preganglionic fibers derived from the vagus nerve
- Afferent "pain" fibers following sympathetic pathways to spinal levels T10(11-12)
- Vas deferens - under sympathetic control, the walls (2-3 mm thick) of the vas deferens contract to discharge spermatozoa
- Within the cord the Vas deferens lies posterior to the testicular artery
- Distally, the Vas deferens forms the tail of the epididymis at the posterior inferior pole of testis
- Further distally the tail gives way to the body and then to the head of the epididymis at the posterior superior pole
- Deferential artery - branch of the internal iliac artery vascularizes the vas deferens and anastomoses with the testicular artery
- Deferential autonomic plexus - derived from the superior/inferior hypogastric autonomic plexus to prostatic plexus
 - Parasympathetic preganglionic fibers possibly derived from pelvic splanchnics (S2-4)
 - Afferent "pain" fibers following sympathetic pathways to spinal levels T10(11-12)
- Deferential lymphatics - drainage to internal iliac nodes, to lumbar lymph ducts, to cisterna chyli
- Genital branch of genitofemoral nerve - mediates efferent component of cremasteric reflex
- Cremasteric artery - branch of inferior epigastric artery vascularizes the tunics

The cremasteric fascia is superficial to the internal spermatic fascia and deep to the external spermatic fascia

- Derived from internal oblique muscle, the cremasteric fascia contributes to the cord within the inguinal canal
- Genital branch of the genitofemoral nerve - provides somatic motor supply
- Cremasteric artery - branches provide vascularization to the cremasteric fascia