Unit 30: Perineum

Dissection Instructions:

The perineum is related to the pelvic outlet and their bony boundaries are the same (Plates 240, 340-342; 3.1-3.3, Table 3.1 and figures-pp. 190 & 191). However, the perineum consists of all the tissues from skin to pelvic diaphragm.

Review the bony pelvis which consists of two hip bones and the sacrum (Plates 340-342; 3.1, 3.2). The two pubic bones articulate with each other at the symphysis pubis. Note the ischiopubic rami extend laterally and posteriorly from the lower end of the symphysis. They end as the ischial tuberosities. Superior to the ischial tuberosities, in order, are the lesser sciatic notch, ischial spine and greater sciatic notch, which reaches the area of articulation with the sacrum. Strong ligaments between the sacrum and hip bone convert the lesser and greater sciatic notches into the lesser and greater sciatic foramina (Plates 340, 341; 3.1C). The sacrospinous ligament extends from the lower sacrum and coccyx to the ischial spine (Plates 341; 3.3). It is internal to the sacrotuberous ligament and much weaker. The sacrotuberous ligament arises from the posterior superior iliac spine and back of sacrum and coccyx to attach to the ischial tuberosity.

The perineum is diamond shaped with the points of the diamond corresponding to the symphysis pubis anteriorly, ischial tuberosities laterally and coccyx posteriorly (Plates 363; 3.42). Between these points are the ischiopubic rami anterolaterally and the sacrotuberous ligaments posterolaterally. A line drawn between the ischial tuberosities divides this area into an anterior urogenital triangle and a posterior anal triangle. The urogenital triangle contains the urogenital diaphragm, root of the penis/clitoris and their muscles, vagina in the female, and the nerves and vessels which supply them. The anal triangle contains the anus, external anal sphincter, inferior rectal nerves and vessels and a lot of fat.

DISSECTION OF THE MALE PERINEUM

With the cadaver in the supine position, carefully remove the skin from the penis and scrotal sac. The skin on the penis is very thin. With the cadaver in the supine position slightly flex the hip and knee joints and abduct the thighs. Make an incision circling the anus. Make another incision from one ischial tuberosity to the other, anterior to the anus. Now make a mid-line incision so that four flaps of skin can be reflected.

Now observe the superficial fascia directly below the skin. The superficial fascia in the urogenital triangle has fatty and membranous layers. The fatty layer is typical and is continuous with a similar layer in the scrotum, around the anus, and along the medial thigh. The deeper membranous layer (called Colles' fascia) is thin yet strong. Note that it also blends anteriorly with that over the genitalia (note that over the penis and scrotum both layers of the superficial fascia forms only one layer called Dartos fascia), and. The abdominal wall (with Scarpa's fascia). Review its bony and muscular attachments. (Plates 363, 364; 3.44)

Carefully attempt to identify the membranous layer of superficial fascia, then reflect it laterally for later demonstration. A space has been entered, the superficial perineal pouch or space bounded inferiorly by Colles fascia and superiorly by the inferior fascia of the urogenital diaphragm (not seen yet). Review what this space contains. Without destroying the blood vessels and nerves of the superficial pouch, locate by palpation the bulb of the penis, in the mid-line, and the crura of the penis, attach
laterally to the ischiopubic rami (Plates 364, 365; 3.42, 3.44, Table 3.6 and figures-pp. 246 & 247). These erectile bodies are covered by voluntary muscles, the bulbospongiosus (bulbocavernosus) and ischiocavernosus muscles, which should be cleaned. Between the bulb of the penis and the crura can be seen the inferior fascia of the urogenital diaphragm, which is the deep (superior) boundary of the superficial perineal pouch. In the superficial perineal pouch, the superficial transverse perineal muscle parallels the posterior border of the urogenital diaphragm. This muscle is very feeble, sometimes absent, and not worth spending much time looking for. Palpate and recognize the perineal body or central tendon of the perineum.

The blood vessels of the superficial space are the perineal branches of the internal pudendal vessels and the nerves are the perineal branches of the pudendal nerve. Follow them anteriorly as the posterior scrotal vessels and nerves. The perineal nerve is the motor nerve to the voluntary muscles in the superficial perineal pouch as well as those of the deep perineal space (see below). (Plates 366, 385, 391; 3.44)

Note that the superficial vessels on the dorsal surface of the penis are branches of the external pudendal vessels of the thigh (Plates 247, 385; 2.4). These vessels and the superficial fascia of the penis should be removed. Next note that the shaft (or body) of the penis is surrounded by deep fascia (called Buck's fascia). Follow this fascia posteriorly and note that it continues as the investing fascia of the muscles of the superficial space. Remove the ischiocavernosus muscle from one crus to show that the deep fascia also continues onto the crus of the penis. Locate and clean the deep dorsal vein, dorsal artery and dorsal nerve of the penis (Plates 389; 3.4, 3.51 A&B). The deep dorsal vein is usually unpaired, but the others are paired. The deep dorsal vein passes between the arcuate ligament of the symphysis pubis and the transverse ligament (the thickened anterior border of the urogenital diaphragm) to enter the prostatic plexus of veins in the pelvis. Follow the dorsal artery and nerve of the penis to the root of the penis. Carefully elevate the bulb of the penis and identify the urethral artery, the artery to the bulb and the urethra entering the bulb from the urogenital diaphragm. Attempt to free the corpus spongiosum and glans penis from the corpora cavernosa. Carefully detach the exposed crus from the urogenital diaphragm. As the crus is being elevated, look for the deep artery of the penis entering the crus from the urogenital diaphragm (Plates 366, 385; 2.14, 3.51B). At the point where the crus continues into the body of the penis, it is held tightly to the symphysis pubis by the suspensory ligament of the penis. This must be cut to follow the dorsal artery and nerve into the deep perineal pouch.

Now enter the deep perineal space (pouch). The deep perineal pouch is the space between the superior and inferior fascias of the urogenital diaphragm. Review its contents before proceeding. As the inferior fascia of the urogenital diaphragm is reflected to follow the nerve and vessels, attempt to identify muscle fibers in the urogenital diaphragm (Plates 366; 3.42, Table 3.6 and figures-pp. 246 & 247). One of its muscles, the sphincter urethrae muscle, encircles the membranous urethra as it passes through the urogenital diaphragm. Posteriorly in the diaphragm is another muscle, the deep transverse perineal muscle. Posterior and lateral to the membranous urethra is the bulbourethral gland. It is embedded in the sphincter urethrae muscle and has a duct which empties into the penile urethra about 1 cm distal to where the membranous urethra enters the bulb.

The deep and dorsal arteries of the penis are the terminal branches of the internal pudendal artery (Plates 385; 3.51B), which runs anteriorly in the deep perineal space along the ischiopubic rami. While in its course within the substance of the urogenital diaphragm, the internal pudendal artery also gives off an artery to the urethra and an artery to the bulb, which you have already seen perforating the inferior diaphragmatic fascia. Trace the internal pudendal artery and vein to the posterior margin of the urogenital diaphragm. The superior fascia of the urogenital diaphragm is on the deep (superior) side of the muscles making up the urogenital diaphragm.
Turn the body into the prone position.

Reflect the skin to expose the whole anal triangle. In the anal triangle, make an incision just medial to the ischial tuberosity and slightly posterior into the fat of the ischioanal/rectal fossa (Plates 363, 364, 373, 383, 391; 3.42, 344, 3.46, 3.51). Push your finger into the fat and locate the inferior rectal vessels and nerves passing from the lateral wall of the fossa to the external anal sphincter. They should be cleaned, then the fat removed from the entire ischiorectal fossa. After the fat is removed, note that the superior medial boundary of the fossa is the pelvic diaphragm, while the lateral boundary is the fascia over the obturator internus muscle, the sacrotuberous ligament and overlapping gluteus maximus muscle. Follow the ischioanal(rectal) fossa anteriorly into the urogenital triangle and note that it continues superior to the urogenital diaphragm as the anterior recess of the ischiorectal fossa.

Clean the external anal sphincter (Plates 376; 3.60b, 3.61). In the lateral wall of the ischiorectal fossa, identify the obturator fascia covering the obturator internus muscle. Locate by palpation the ischial spine and lesser sciatic foramen. Trace the inferior rectal neurovascular bundle into the obturator fascia and open the pudendal canal (Plates 385, 391; 3.45, 3.46). Find in the pudendal canal the internal pudendal vessels and the pudendal nerve. (Plates 373; 3.44) The canal begins at the lesser sciatic foramen and ends at the posterior margin of the urogenital diaphragm. The inferior rectal vessels and nerves leave the canal close to its beginning while the perineal vessels and nerves leave as the canal approaches the diaphragm. The internal pudendal vessels and the dorsal nerve of the penis go directly from the canal to the deep perineal pouch.

**DISSECTION OF THE FEMALE PERINEUM**

With the cadaver in the supine position, slightly flex the hip and knee joints and abduct the thighs. Note the external genitalia of the female (in an area called the vulva) (Plates 359, 60;3.52,3.53). The labia majora have pubic hair and are separated by the pudendal cleft. In the pudendal cleft are the clitoris and labia minora. The labia minora are devoid of hair and end anteriorly by dividing into two folds of skin. The medial folds join to form the frenulum of the clitoris and the lateral folds join to form the prepuce of the clitoris. The glans clitoris is found within the prepuce between it and the frenulum. The space between the labia minora is called the vestibule of the vagina. The vestibule contains the openings of the urethra, vagina and duct of the greater vestibular gland. The opening of the vagina is marked by remnants of the hymen.

Make a transverse incision through the skin from one ischial tuberosity to the other. Make a second incision in the mid-line, except encircle the clitoris, urethral opening, vaginal opening and anus. Reflect back the four flaps of skin thus formed. Note the superficial fascia; it has a superficial fatty layer and a deeper membranous layer. The fatty layer is typical and is continuous with a similar layer in the labia majorum, around the anus, and along the medial thigh. The deeper membranous layer (called Colles' fascia) is thin yet strong. Note that it also blends anteriorly with that over the genitalia and. The abdominal wall (with Scarpa's fascia). Review its bony and muscular attachments.

Review the superficial inguinal ring and attempt to follow the round ligament of the uterus with its three coverings into the fat of the labia majora (Plates 350; 2.14, 3.53, 3.56). The distal fibers making up the round ligament frequently spread out and are not recognizable. Remove the fat of the labia majora and identify the membranous layer of superficial fascia. Reflect the membranous layer from medial to lateral, leaving it attached to the ischiopubic rami for demonstration. You have now entered a space (the superficial perineal pouch) bounded inferiorly by Colles fascia and superiorly by the inferior fascia of the urogenital diaphragm (not seen yet). Review what this space contains in the female.
Without destroying blood vessels and nerves, locate and clean the ischiocavernosus and bulbocavernosus muscles which cover the crura and bulb of the vestibule, respectively (Plates 360, 361; 3.42, 3.52, 3.54, 3.56, Table 3.6 and figures—pp. 246 & 247). In the same plane, the superficial transverse perineal muscle extends from the ischial tuberosity to the perineal body or central tendon of the perineum. The muscle is probably unrecognizable or absent. The central tendon is located between the vagina and anus. The perineal blood vessels and nerves of the superficial perineal pouch enter posteriorly and end anteriorly as the posterior labial vessels and nerves. The skeletal muscles in the urogenital triangle are all innervated by the perineal nerve. The firm white fascia found deep between the crus and bulb is the inferior fascia of the urogenital diaphragm, the superior boundary of the superficial perineal pouch.

On one side, carefully remove the ischiocavernosus and bulbospongiosus muscles to reveal the crus of the clitoris and the bulb of the vestibule (Plates 361; 3.54). These are erectile tissues, thus are made up of venous sinuses. Elevate the posterior end of the bulb and try to identify the greater vestibular gland, whose duct opens into the vestibule of the vagina.

Carefully incise the skin on the dorsum of the clitoris to locate the deep dorsal vein, dorsal artery and dorsal nerve (Plates 384, 393; 3.54). The nerve is lateral and may be the largest of the three named structures. Follow the dorsal nerve and artery to the base of the clitoris on the side that the crus and bulb were exposed. Detach and elevate the base and crus to follow the neurovascular structures through the inferior fascia of the urogenital diaphragm. As the crus is elevated, try to locate and identify the deep artery of the clitoris. Reflect the inferior fascia of the urogenital diaphragm as needed to follow the neurovascular structures. Now enter the deep perineal space (pouch). The deep perineal pouch is the space between the superior and inferior fascias of the urogenital diaphragm. Review its contents before proceeding. As the inferior fascia of the urogenital diaphragm is reflected to follow the nerve and vessels, attempt to identify muscle fibers in the urogenital diaphragm (Plates 361; 3.42B&C, 3.57). One of its muscles, the sphincter urethrae muscle, encircles the membranous urethra as it passes through the urogenital diaphragm. Posteriorly in the diaphragm is another muscle, the deep transverse perineal muscle, if it exists in the female.

Turn the body into the prone position.

Reflect the skin to expose the whole anal triangle. In the anal triangle, make an incision just medial to the ischial tuberosity and slightly posterior into the fat of the ischioanal(rectal) fossa (Plates 360, 361, 384, 393; 3.53, 3.57). Push your finger into the fat and locate the inferior rectal vessels and nerves passing from the lateral wall of the fossa to the external anal sphincter. They should be cleaned, then the fat removed from the entire ischiorectal fossa. After the fat is removed, note that the superior medial boundary of the fossa is the pelvic diaphragm, while the lateral boundary is the fascia over the obturator internus muscle, the sacrotuberous ligament and overlapping the gluteus maximus muscle (Plates 361; 3.54). Follow the ischioanal(rectal) fossa anteriorly into the urogenital triangle and note that it continues superior to the urogenital diaphragm as the anterior recess of the ischiorectal fossa.

Clean the external anal sphincter (Plates 361, 376; 3.52B, 3.55). In the lateral wall of the ischiorectal fossa, identify the obturator fascia covering the obturator internus muscle. Locate by palpation the ischial spine, sacrospinous ligament, and lesser sciatic foramen. Trace the inferior rectal neurovascular bundle into the obturator fascia and open the pudendal canal (Plates 384, 393; 3.53, 3.57). The pudendal canal is a passageway in the obturator fascia which contains the internal pudendal vessels and the pudendal nerve. It begins at the lesser sciatic foramen and ends at the posterior margin of the urogenital diaphragm. The inferior rectal vessels and nerves leave the canal close to its beginning while the perineal vessels and nerves leave as the canal approaches the diaphragm (Plates 379, 386;
The internal pudendal vessels and the dorsal nerve of the clitoris go directly from the canal to the deep perineal pouch.

Insert a finger into the vagina and attempt to palpate the ischial spine, as you would do when giving a pudendal nerve block in a living patient (Plate 393).

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