

PELVIC FLOOR

MUSCLES OF THE PELVIC DIAPHRAGM (*DIAPHRAGMA PELVIS*)

Muscles of the pelvic diaphragm support the pelvic viscera and assist in the constriction of the rectum and vagina.

1. *M. levator ani*

a) *M. iliococcygeus*

Origin: *Arcus tendineus m. levatoris ani*

Insertion: Anococcygeal ligament, coccyx

b) *M. pubococcygeus*

Origin: *Ramus sup. ossis pubis*

Insertion: Coccyx, ventral sacrococcygeal ligament

The medial part of the pubococcygeus (*M. levator prostatae* in males and *M. pubovaginalis* in females) pass on the lateral side of the prostate and vagina, respectively.

It ends in the **perineal body** (*Centrum tendineum perinei*), a fibromuscular node between the anal canal and urogenital apparatus.

The intermediate part of the pubococcygeus (*m. puborectalis*) forms a loop around the anorectal junction and blends with the deep external anal sphincter.

Innervation: the sacral plexus

2. *M. ischiococcygeus/coccygeus*

Origin: *Spina ischiadica*

Insertion: Lateral parts of the coccyx and sacrum

Innervation: the sacral plexus

The **urogenital hiatus** (*Hiatus urogenitalis*) – an anterior gap between the medial borders of the pubococcygeus, which gives passage to the urethra and in females also the vagina

Ischio–anal/ischiorectal fossa (*Fossa ischioanal/rectalis*)

– a wedge shaped fossa below the pelvic diaphragm filled with fat traversed by the inferior rectal nerves and vessels (branches from pudendal nerve and internal pudendal vessels)

– continues anteriorly above the deep perineal pouch towards the symphysis to form the **pubic recess** (*Recessus pubicus fossae ischioanal/rectalis*).

– the mediocranial wall – the inferior pelvic diaphragmatic fascia covering the pelvic diaphragm

– the lateral wall – the obturator fascia covering *m. obturatorius internus*. The obturator fascia forms a canal for pudendal nerve and internal pudendal vessels (*Canalis pudendalis of Alcock*)

– posteriorly – the gluteus maximus muscle and sacrotuberous ligament

PERINEUM (*PERINEUM*; Fig. 33, 34)

The perineum overlies the pelvic outlet and is separated from the pelvic cavity by the pelvic diaphragm. The surface of the perineum is a narrow region between the proximal parts of the thighs. A transverse line in front of the ischial tuberosities divides the region into two triangular parts: the posterior **anal region** contains the end of the anal canal surrounded by the external anal sphincter, the anterior **urogenital region** contains external urogenital structures (see detailed description in the regional anatomy of the pelvis).

PERINEAL MUSCLES (*MM. PERINEI*)

Musculature of the anal region:

M. sphincter ani externus

– a striated sphincter around the lowest part of the anal canal and superficial to the smooth sphincter ani internus. It has the deep, superficial and subcutaneous parts and joins with muscle fibers of puborectalis and some perineal muscles in the perineal body.

Innervation: the sacral plexus

Musculature of the urogenital region:

Deep perineal pouch/urogenital diaphragm (*Saccus profundus perinei/diaphragma urogenitale*)

- between both sides of the pubic arch
- passed by the urethra, additionally by the vagina in the female
- covered inferiorly by the perineal membrane
- muscles of the deep perineal pouch:

1. *M. transversus perinei profundus*

In male – conspicuous, completed anteriorly by **lig. transversum perinei**

In female – small smooth muscle on the posterior edge of the perineal membrane

2. *M. sphincter urethrae externus*

– in female some of its muscle fibers encircle also vagina (***m. sphincter urethrovaginalis***)

3. *M. compressor urethrae* – fibers of the external urethral sphincter that extend to the *ramus ossis ischii* on each side (only in female)

Innervation of all muscles: *n. pudendus*

Superficial perineal pouch (*Spatium superficiale perinei*)

- below the perineal membrane
- muscles of the superficial perineal pouch:

1. *M. ischiocavernosus*

– paired, covers crura penis/clitoridis, compresses them during erection (in male also ejaculation), and inserts to the fascia of the dorsum of penis or clitoris

2. *M. bulbospongiosus*

In male – composed of two symmetrical parts united by the tendinous raphe in the midline covering the bulb of penis

In female – splits in two parts, covers *bulbi vestibuli* and *glandulae vestibulares majores*

The bulbospongiosus is attached to the perineal body.

3. *M. transversus perinei superficialis* – inconstant, at the posterior border of the transversus perinei prof.

Innervation of all muscles: *n. pudendus*

PELVIC FASCIA (*FASCIA PELVIS*)

– a continuation of the transversalis fascia of the abdominal cavity

Fascia pelvis parietalis – covers the obturatorius internus (***Fascia obturatoria***), piriformis (***Fascia piriformis***), coccygeus, levator ani and part of the muscles of deep perineal pouch (***Fascia superior diaphragmatis pelvis***). Fascia obturatoria is reinforced to form the attachment line for the levator ani (***Arcus tendineus m. levatoris ani***).

Fascia pelvis visceralis forms the adventitia of pelvic organs.

Both parietal and visceral fascia merge in the site where the organs penetrate the pelvic floor (***Arcus tendineus fasciae pelvis***). This is a bilateral band extending from the pubis to the sacrum and consists of **pubocervical** and **sacrouterine ligaments** in females, and **puboprostatic** and **sacrogenital ligaments** in males.

Some parts of the pelvic fascia contain a lot of collagen and elastic fibers (smooth muscle cells) and form pelvic ligaments. The **hypogastric sheath** is a thick band of condensed pelvic fascia that provides support for the viscera and gives passage to the vessels and nerves from the wall of the pelvis to the pelvic viscera. In female the hypogastric sheath divides into 3 laminae:

- the lateral ligament of the bladder,
- the cardinal (transverse cervical) ligament (Mackenrodt),
- the lateral rectal ligament.

In the male are the same laminae but the middle lamina is much thinner than in female and forms rectovesical septum (Denonvilliers fascia).

Among these laminae and ligaments is loose fatty tissue e.g. between the pubis and the bladder is the **retropubic (prevesical) space** that extends posterolaterally as **paravesical space**; between the sacrum and the rectum is the **retrorectal** or **presacral space**. These potential spaces allow expansion of the bladder and rectum as they fill.

Fascia inferior diaphragmatis pelvis covers the lower surface of the pelvic diaphragm

The **perineal membrane** (*Membrana perinei/Fascia inferior diaphragmatis urogenitalis*) covers the deep perineal pouch from below.

The **perineal fascia** (*Fascia perinei*) covers the superficial perineal pouch from below.