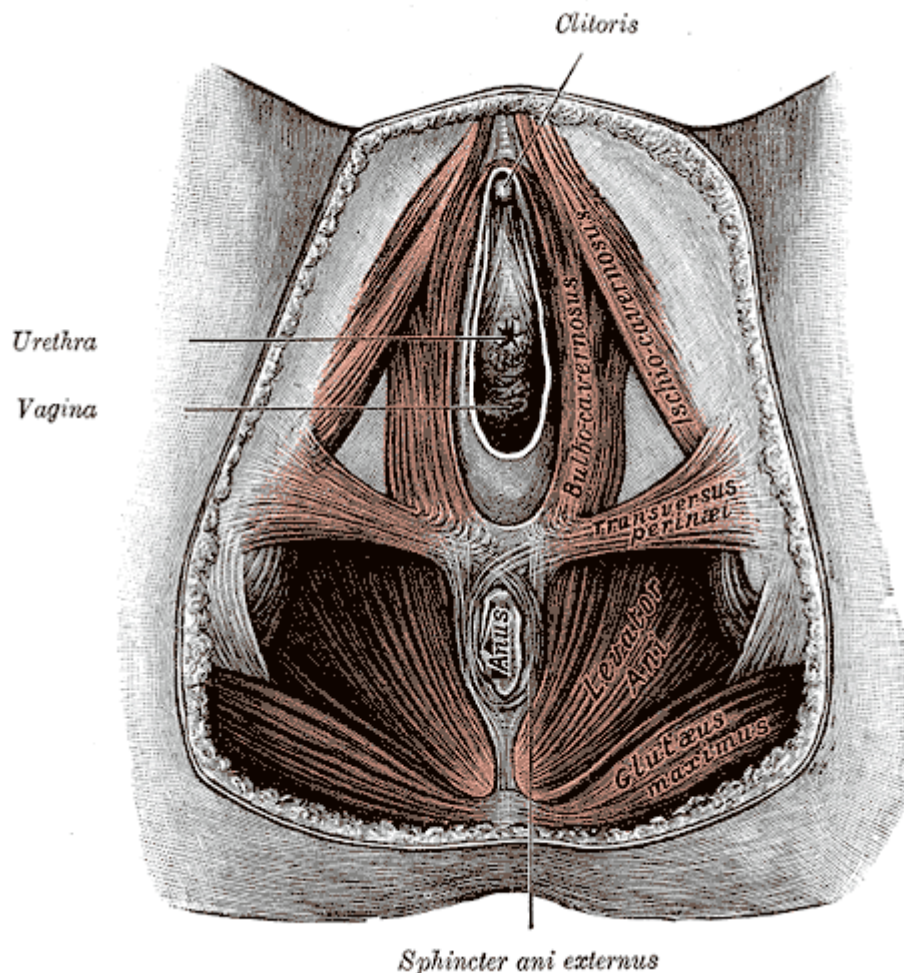


The Anatomy of the Male and Female Perineum and External Genitalia

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The perineum is a diamond-shaped region situated inferior to the pelvic floor which separates it from the pelvic cavity. Several urinary, external genital and lower gastrointestinal structures are located within the perineum. Therefore the perineum plays an important role in bodily functions like defecation, micturition, procreation, and parturition. This article will discuss the boundaries of the perineum, the perineal membrane, the Ischioanal fossa and its contents with their clinical relevance.



Perineum

The perineum is an area located at the lowermost aspect of the pelvis just inferior to its floor and between the thighs. It is **diamond-shaped** and can be divided by an imaginary line drawn between the two **ischial tuberosities**, into an anterior urogenital triangle and

a posterior anal triangle.

The boundaries of the perineum are:

- **Roof:** pelvic diaphragm
- **Floor:** fascia and skin
- **Anteriorly:** pubic symphysis
- **Posteriorly:** the coccyx
- **Laterally:** the ischiopubic rami, sacrotuberous ligaments

Blood supply to the Perineum is from the Pudendal nerves (S2 to S4) and the pudendal vessels. Lymphatic drainage is to the superficial inguinal, deep inguinal and the internal iliac nodes.

Urogenital Triangle

This triangle is located in the **anterior** part of the **perineum**. Its base is formed by an imaginary line connecting the two ischial tuberosities and is bounded by the pubic symphysis anteriorly and the ischiopubic rami on either side. It is composed of the **urethra** and the **external genitalia**.

The urogenital triangle consists of several layers of fascia. From superficial to deep the layers of the fascia are:

Skin: it is the epithelial surface onto which the urethral and the vaginal orifices open

Superficial Perineal fascia: this fascial layer is continuous with the superficial layer of the fascia of the abdominal wall. It consists of two layers – a superficial, fatty layer which forms the labia majora and mons pubis in females and a deep layer (fascia of Colles).

Deep Perineal Fascia: this layer of fascia encloses the perineal muscles

Superficial Perineal pouch: is a potential space located between the deep perineal fascia and the perineal membrane. It contains the erectile tissues of the penis and clitoris, the Bartholin's glands and the ischiocavernosus, bulbospongiosus and superficial transverse perineal muscles.

Perineal Membrane: The perineal membrane is a dense fascial layer which covers a major part of the urogenital triangle. It provides support to the pelvic diaphragm superiorly and anchors the external genitalia inferiorly. The urethra and the vagina pass through the perineal membrane to open onto the surface of the skin.

Deep perineal pouch: this is a potential space between the perineal membrane and the pelvic floor. The external urethral sphincter, part of the urethra and in males, the bulbourethral glands and the transverse perineal muscles are contained within this pouch.

The **perineal body** is a midline structure formed by dense connective tissue. It anchors the perineal membrane as well as provides attachment to several perineal muscles:

- Superficial and deep transverse perineal muscles
- Bulbospongiosus
- External anal and urethral sphincteric muscles
- Levator ani forming a part of the pelvic floor

It is located between the **penile bulb and the anus** in males while in females it lies between the **vagina and external anal sphincter**. It provides support to the posterior

vaginal wall and prevents vault prolapse in females.

The perineal structures in males and females develop from identical structures. The male penis is identical structurally to the clitoris in females but is wider. The clitoris is composed of the corpora cavernosa, is covered by the prepuce and ends in a glans similar to the penis in males. The corpus spongiosum in males is equivalent to the vestibular bulbs in the females.

Male Perineum

The Urogenital triangle in the male perineum includes the **penis**, the **scrotum**, and the **perineal muscles**. The penis consists of the root and the body or the corpus. The glans penis is covered by the foreskin. Three columns of tissue: the two corpora cavernosa and the corpus spongiosum ventrally form the body of the penis. The male urethra runs through the prostate where it is met by the ejaculatory duct.

The two, then continue through the penis. The urethral meatus is located at the tip of the glans penis. The urethra serves as a passage for semen as well as urine. The scrotum is a sac situated posteroinferior to the penis and contains the two testes. The scrotal raphe is a midline ridge that runs on the ventral surface of the scrotum and then continues along the ventral surface of the penis as the penile raphe.

The muscles in the male perineum include:

The superficial transversus perineal muscle: originates from the inner aspect of the ischial tuberosity and inserts into the central perineal body where it is met by its counterpart from the opposite side. Simultaneous contraction of the superficial transverse perineal muscles on either side results in perineal contraction and fixation.

Ischiocavernosus: this originates from the inner aspect of the ischial tuberosity and from the pubic and ischial rami. The fibers insert finally on the inferior aspect of the penile crus. Contraction of this muscle prevents venous return and helps to maintain penile erection.

Bulbocavernosus: this muscle is located anterior to the anus and consists of two symmetrical halves which meet in a median raphe. The anterior fibres of the muscle run on either side and then insert into the corpus cavernosum of the penis. It helps to evacuate the urethra towards the terminal part of micturition.

Transverse perineal profundus: it originates from the inferior ischial ramus and then meets its counterpart from the opposite side at the median tendinous raphe.

Sphincter urethrae: it has external and internal fibers. The external fibres run from the pubic ramus to around the anterior aspect of the urethra and bulbourethral glands to unite with fibres from its opposite counterpart at the median tendinous raphe. The inner fibres enclose the membranous urethra in a circular fashion. Their contraction causes urethral constriction.

Female Perineum

The Urogenital triangle in females consists of the **vulva** or the **external genitalia**, the **urethral** and **vaginal** orifices, and the **perineal muscles**. The vulva or external genitalia includes the **mons pubis**, the labia majora, the labia minora, the vestibule, and the clitoris. The clitoris consists of a body and the glans. The body of the clitoris contains

the two corpora cavernosa and the ischiocavernosus muscle. The glans has erectile tissue and several nerve endings which make it sensitive.

The muscles in the female perineum include:

The superficial transverse perineal muscle: originates from the inner aspect of the ischial tuberosity and inserts into the central perineal tendon where it is met by its counterpart from the opposite side. Simultaneous contraction of the superficial transverse perineal muscles on either side results in perineal contraction and fixation.

Ischiocavernosus: this muscle originates from the inner surface of the ischial tuberosity, from the clitoral crus and ischial ramus. It is inserted on the sides and inferior surface of the clitoral crus. It contracts the crura of the clitoris, thereby preventing venous return and helping to preserve clitoral erection.

Bulbocavernosus: This muscle forms the vaginal sphincter and surrounds the vagina. Its fibers then pass posteriorly to attach to the perineal body and blend with the external anal sphincter. Anteriorly, its fibres are inserted into the clitoral corpora cavernosa. Its action is to reduce the size of the vaginal orifice and its anterior fibres, by compressing the deep dorsal vein, help in clitoral erection.

Transversus perineal profundus: this muscle originates from the inferior ischial rami and runs beside the vagina.

Sphincter urethrae: it has external and internal fibres. The external fibres run from the pubic ramus to meet fibres from the opposite side between the vagina and the urethra. The inner fibres run around the inferior part of the urethra. Their contraction causes urethral constriction.

Anal Triangle

This triangle forms the posterior part of the perineum. The base of the triangle is formed by an imaginary line connecting the two ischial tuberosities. The coccyx and the sacrotuberous ligaments form its other boundaries. The triangle consists of

- Anus and the anal aperture;
- Two Ischioanal/ ischiorectal fossae on either side of the anal canal;
- External anal sphincter which opens and closes the anal aperture.

Ischioanal Fossa or the Ischiorectal Fossa

It is a space located on either side of the anal canal. It has been described as wedge or prism-shaped with its base being formed by the skin. The apex of this space is situated deep, directed towards the pubic symphysis. The anococcygeal body separates the two fossae. However, the fossae communicate with each other superior to the anococcygeal body and also posterior to the anal canal.

Boundaries of the Ischioanal /ischiorectal fossa are:

- **Base:** formed anteriorly by the posterior edge of the perineal body and the urogenital diaphragm and posteriorly by the gluteus maximus muscle and the sacrotuberous ligament
- **Lateral wall:** formed by the ischial tuberosity, obturator internus muscle and the obturator fascia
- **Medial wall:** formed by the anal canal, external anal sphincters and the

levator ani muscle

- **Roof:** Levator ani muscle
- **Apex:** is at the junction of the obturator internus muscle and Levator ani muscle

The contents of the Ischioanal/ Ischioanal fossa are:

- Pudendal canal: Also called the **Alcock's canal** is a fibrous sheath formed by the obturator fascia. It is located on the **lateral wall of the fossa**. It contains the pudendal nerves and internal pudendal vessels.
- Ischioanal pad of fat: this is dense fat whose function is to support the anal canal and allow it to distend when defecating. Numerous fibrous bands run transversely through this pad of fat.
- Inferior rectal /hemorrhoidal vessels and nerves run across the fossae towards the anal canal
- Posterior scrotal (in males) or labral (in females) nerves and vessels
- Perforating cutaneous nerve
- Perineal branch of S4
- Lymphatics

Clinical Relevance

Trauma to the Perineal body: can occur during parturition. This can be prevented by a timely episiotomy. Damage to the perineal body can lead to prolapse of the vaginal vault and pelvic structures.

Perineal pouches: are clinically significant in cancer and trauma, especially urethral tears wherein urine may extravasate into the pouch

Perianal abscess: Infection or inflammation with obstruction of the deep submucosal glands in the perianal space can lead to perianal abscess formation especially in presence of comorbid conditions like diabetes mellitus, Crohn's disease, trauma, and malignancy. Internal drainage in the anal canal may be required if the inflammation fails to resolve spontaneously.

Perianal fistula: is a fistulous tract connecting the anal canal between the external and internal anal sphincter and the overlying skin. It often occurs when a perianal abscess fails to heal.

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