©UMC St Radboud POJA COLLECTION

POJA-L-1899 Description of female external genitalia or vulva.

The female external genitalia are commonly referred as **vulva**. This include the **mons pubis**, **clitoris**, **labia majora** and **labia minora pudenda**, **vestibule** and **vestibular glands**.
The **mons pubis** (mons veneris) is an eminence anterior to the pubic symphysis. Subcutaneous adipose tissue is overlying the symphysis pubis and is covered by keratinising squamous stratified epithelium (or **epidermis**) with hair follicles, sebaceous, eccrine and apocrine sweat glands.

As a homologue of the penis the **clitoris** is a small erectile structure (up to 4mm) partially enclosed by the anterior bifurcated ends of the labia minora. It is a complex composed of body, crura, bulbs with an external tip the so-called glans clitoris. There are two erectile corpora cavernosa surrounded by dense fibrous tissue in the body and they are partly separated by an incomplete septum. Cavernous tissues with smooth muscle trabeculae around sinusoidal spaces form the bulk of clitoral body and crura, both embedded in a dense connective layer, as well as the bulbs. The crura are internal continuation of the corpora. The clitoral body itself is surrounded by large neurovascular bundles, especially at the anterior tip. Ventral to the urethra the bulbs are located and descend on either side on the lateral distal vagina wall, straddled by the crura and lie dorsal to the clitoral body. The bulbs are closely associated with the great vestibular glands (Bartholin, see below) and excretory ducts. The glans clitoridis is a small tubercle-like non-cavernous structure, densely innervated and lined by a thin epidermis, a vascular dermis, solitary sebaceous glands and nerve trunks with neuroreceptive organs. It appears that Pacinian corpuscles in the clitoris body are rapidly adapting sensory receptors sensitive to vibration. Together with the presence of large neurovascular bundles in both corpora/glans and numbers of these corpuscles this indicates quick deep sensation responses in their physiological behaviour.
Labia majora are extensions of the mons pubis with two longitudinal cutaneous folds extending downward to the perineum. They form the lateral bounderies of the cleft of venus. Each labium is surfaced by an external pigmented keratinising squamous stratified epithelium (epidermis) with hairs (pilosebaceous compexes). The internal surface (non-keratinising squamous stratified epithelium or NKSSE) shows solitary sebaceous glands. The dermis contains loose connective tissue, adipose tissue and is intermingled with smooth muscle. Hormonal regulation of hair follicles and fat accumulation starts in puberty. Blood vessels, nerves, eccrine as well as apocrine sweat glands are all over present. Labioscrotal folds in the embryo develop into scrotum or labium majus. Homologue to the scrotum's dartos muscle (non-striated muscles) the labium majus also contains bundles of smooth muscle in the reticular layer.

Labia minora are also two small cutaneous folds covered by slightly keratinised epithelium. They contain numerous solitary sebaceous and sweat glands but lack hair follicles and adipose tissue. Between the labia majora they extend from the clitoris flanking the vaginal orifice. The cavity between both labia minora (so-called **vestibule**) contains orifices of vagina and external urethra as well as openings of draining ducts of small and large glands (Bartholin's glands). The vestibule is lined by NKSSE and is involved in the production of smegma.

The pea-sized vulvovaginal **glands of Bartholin** (great vestibular glands) are homologues of the male bulbo-urethral glands. They flank the vaginal orifice and are in contact or overlapped by the posterior end of the vestibular bulb. The glands drain via ca. 2 cm long ducts lined by transitional epithelium into the vestibule. These tubuloaveolar glands produce clear, white mucus with lubricant properties as a result of sexual stimuli. Smaller mucous glands (minor vestibular glands) scattered throughout the area bounded by labia minora also drain their secretion directy into the vestibule. The dermis is well provided with elastic fibers, numerous sensible nerve endings in the same area of the extensive venous plexus. In contrary to the labium majus no hair follicles, eccrine sweat glands, smooth muscle bundles and adipose tissue are present.

The **female urethra** has a folded mucosa covered by transitional epithelium proximally and distally towards the orifice pseudostratified epithelium. Near the urethral meatus (close to the clitoris) the lining changes into slightly keratinised squamous stratified epithelium. Within the mucosa mucus-secreting glands (so-called endoepithelial glands) are present. Aditionally paired **para-urethral glands of Skene** (with pseudostratified lining) are also distributed around the orifice. The urethral muscular wall is composed of longitudinal smooth muscle layers (involuntary muscle) and external circular arranged skeletal muscle layers (volontary muscle). Elastic fibers-rich connective tissue supports the urethral wall.