

Rectum

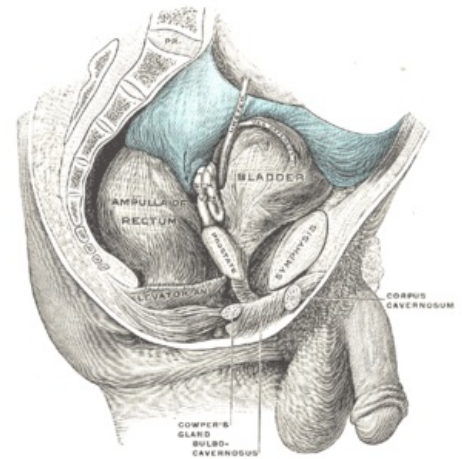
This is the last section of the large intestine. It is located in a small pan. It is 12–16 cm long and about 4 cm wide. The filled rectum is triple curved laterally (viewed anteroposteriorly) and double ace-curved anteroposteriorly (viewed from the side). The lateral curvature is given by a sharper concavity on the right side of the rectum. In the middle of its length, in the place of the **Kohlrausch fold**, at the base of which there is a strengthened circular muscle, against this hollow the rectum arches to the left, above it and below it to the right.

Anterior double curvature:

1. **flexura sacralis** – in the cranial three-quarters of the length of the rectum, parallel to the curvature of the sacrum and the skeleton (backward convexity);
2. **flexura perinealis** – at the beginning, the last fifth to a quarter of the length, bends the rectum at and below the tip of the coccyx backwards towards the anal opening (rectum arched forward by convexity);

The rectum has two main parts:

1. **ampulla recti** (rectum in the narrower sense of the word) – cranial part, length 10–12 cm, in the range of the *flexura sacralis*, passes through the perineal flexure into:
2. **canalis analis** – length 2.5–3.8 cm, narrower, differs in the longitudinal orientation of the mucous cilia.



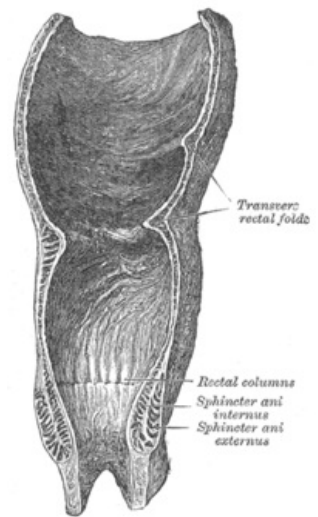
Syntopy of the rectum (with filled ampulla and bladder)

Rectal mucosa

It has the same color and appearance as colon. We find typical '*mucous algae*' and other formations on it.

In the *ampulla recti* we find:

- **plicae transversales recti** – in the middle of the length of the ampulla, usually three:
 1. upper and lower eyelashes – arises from the left wall;
 2. Kohlrausch eyelash – middle, starting from the right wall;
- **linea anorectalis** – border of the ampullary part of the rectum and the anal canal, goes across the rectum at the tip of the coccyx.



Longitudinal section of the rectum

In *canalis analis* we find:

- *columnae anales* – longitudinal cilia, 6–10 pcs. around the canal;
- *sinus anales* – depressions between the lower ends of the *columnae anales*;
- *valvulae anales* – mucosal cilia in the shape of transverse arches, ending caudally with the *sinus anales*;
- *zona haemorrhoidalis* – a strip of mucous membrane at the level of *columnae et sinus anales*, underlain by the plexus venosus rectalis and m. sphincter ani internus;
- epithelium rectal mucosa in ampoule **single layer cylindrical**, ability to absorb (suppositories);
- numerous **Lieberkühn crypts** – amount of goblet cells;
- *glandulae anales* – mucous glands in the location of the *sinus anales*, six tubules each, opening into the anal crypts, secreting mucus;
- mucosal tissue – contains folliculi lymphatici solitarii;
- *lamina muscularis mucosae* – strong;
- epithelial change during the *canalis analis* – epithelium single-layered cylindrical → multilayered squamous non-keratinized;
- *pecten analis* – a lighter strip of mucous membrane following the *valvulae anales*, multi-layered squamous epithelium not keratinizing, submucosal tissue denser and firmer.

Submucosal ligament of the rectum

The submucosal tissue is high and sparse. The mucous membrane can move caudally due to its weight and with the movement of the contents until it protrudes from the anus – mucosal prolapse.

Rectus muscle

The outer longitudinal layer is continuous and forms the so-called '*sheath*' of the rectum. All three taenia expanded and strengthened into the mantle. The circular layer of smooth muscle is strengthened in the upper three-quarters of the anal canal, in the area of the *zona haemorrhoidalis*, *valvulae anales*, and *pecten analis*. It forms here the *musculus sphincter ani internus*, which ends just above the *linea anocutanea*. Attached to the rectal muscle from the perineum is the *musculus sphincter ani externus*, which is formed by striated muscle.

Surface layer of the rectum

The Peritoneum wraps the rectum at the transition from the ace loop. Sometimes they also form a short *mesorectum*. Next, the rectum sinks under the peritoneum of the small pelvis. The connection of the peritoneum with the wall of the rectum extends most caudally on the front side of the rectum - in women to the level of the Kohlrausch fold, in men a little higher. From there, the peritoneum passes to the *vesica urinaria* in men, to the *uterus* in women.

Deeper folds of the peritoneum are thus formed:

- *excavatio rectovesivalis* – in men;
- *excavatio rectouterina*– in a woman (deeper);
- *recessus pararectales* – slight depressions of the wall peritoneum on the sides of the rectum.

From the immersion under the peritoneum, the surface of the rectum is covered with fibrous adventitia (fascia recti).

Rectal syntopy

Above the level of the diaphragma pelvis, the rectum meets:

- *behind*: with vertebrae S₃–S₅ + coccyx via a thin ligament – it is connected to them by means of the smooth muscle *musculus rectococcygeus* and *ligamentum anococcygeum*;
- *anteriorly in ♂*: with the posterior wall of the bladder and with the *vesiculae seminales* through the *septum rectovesicale*;
- *in front in ♀*: with the back wall vagina through the *septum rectovaginale* - strengthens the perineal wedge;
- **lateral surfaces of the rectum** - facing the *musculus levator ani*.

Below and at the level of the *diaphragma pelvis* the rectum meets:

- *behind* – with the ligament in front of the coccyx and below the tip of the coccyx, in the place of the *ligamentum anococcygeum*;
- *in front* - with the muscles of the perineum, in front of the rectum - between it and the vagina - in women, the *perineal wedge*;
- on the sides of the *musculus sphincter ani externus* - pits filled with fat - ***fossa ischiorectalis dextra et sinistra***.

Anus

It is the external termination of the canalis analis. The anus is lined with skin. The skin is more pigmented, contracted and folded into radial folds by the action of the sphincters. **Crena ani** is a depression at the site of the anus. It is covered by the edges of the buttocks, there are thicker hairs in the immediate vicinity of the anus.

Glandulae circumanales is an apocrine sweat gland forming a ring around the anus. The rigid fibrous plate that connects the wall of the anal canal with the coccyx in the median plane is called the ``ligamentum anococcygeum'. *The mechanism of anal closure is caused by the sphincters and pelvic floor muscles.*

M. sphincter ani internus - reinforced **smooth circular muscle**' of the anal canal, ring from the *linea anocutanea* cranially to the *columnae anales*.

M. sphincter ani externus - sphincter from the **striated muscle**', wraps around the *musculus sphincter ani internus* from the outside, attached to the *musculus levator ani* from below ', has three parts:

1. ***pars profunda*** The deep component of the muscle, which is located most cranially. It lies just below the passage of the rectum through the *diaphragma pelvis*. Behind and laterally, it is in contact with the ``puborectalis muscle. *It is part of the pelvic floor* (musculus levator ani). *The medial muscle fibers are **circular**, the lateral muscle fibers form an anterior open fork. They are fixed to the hiatus urogenitalis. Together with the ``puborectalis muscle*, it forms the most important component of the closing mechanism of the anus - the functional name of the ``compressor recti muscle.

2. ***Pars superficialis***; Formed mainly by circularly arranged fibers anchored anteriorly to the *centrum tendineum perinei* and posteriorly to the *ligamentum anococcygeum*. Contraction narrows the anal canal.

3. ***Pars subcutaneous***; It has a subcutaneous ring of muscle fibers. It is fixed by strips of ligament and smooth muscle to the skin around the anus, which it pulls in and gathers with its contraction. Its functional component is *m. corrugator ani*.

M. puborectalis - part of the *pelvic floor* muscle, it recedes on both sides of the symphysis, goes along the *hiatus urogenitalis* externally from the *musculus levator prostatae* (*m. puboprostaticus*) of men or *musculus pubovaginalis* of women, surrounds the anal canal from behind at the level of *pars profunda m. sphincter ani*

externus, creates the *musculus compressor recti*.

Muscle innervation: nervus pudendus, components from the *musculus levator ani* - directly from the *plexus sacralis* (S₃-S₄).

Defecation

Faeces passes from the *colon sigmoideum* to the rectum → expansion of the ampulla → reflex relaxation of the *musculus sphincter ani internus*. Reflex contraction of the *musculus sphincter ani externus* and *musculus puborectalis* and activity of the abdominal press → expulsion of contents Gastrocolic reflex - distension of the stomach by food can also cause contraction of the *colon sigmoideum*.

Tapible formations during examination per rectum

 For more information see *Per rectal examination*.

- contracted *musculus sphincter ani externus*;
- *musculus sphincter ani internus*;
- flexible narrowing at the point of passage of the rectum through the diaphragm pelvis;
- extension into *ampulla recti*;
- coccyx (posteriorly);
- *spinae ischiadicae* (laterally).

In addition, in addition:

- ♂ – prostate (in front of the rectum), distended urinary bladder (above the prostate);
- ♀ – resistance of the ligament of the perineal wedge, cervix (above it, through the vaginal wall).

Links

Related Articles

- Colon

References

- ČIHÁK, Radomír – GRIM, Miloš. *Anatomy*. 2. upr. a dopl edition. Grada Publishing, 2002. 470 pp. vol. 2. ISBN 80-247-0143-X.