

Sacral plexus

The **sacral plexus** is the largest nerve plexus in the human body. It is formed on the sides of the *sacral bone*. It is formed by the connection of the front branches of the sacral nerves - **S1–S5**, which emerge in the *foramina sacralia anteriora (pelvica)*. The fibers of the anterior branches of the lumbar nerves - **L4 and L5** are also connected to this plexus. These join in the *truncus lumbosacralis*, which approaches from above. The **n. coccygeus** is connected from below, which emerges from the *hiatus sacralis*.

- The plexus also contains *parasympathetic* – **sacral parasympathetic** fibers in the **S2–S4** nerves.

From the plexus sacralis arise:

- **short muscle branches** – for the *pelvitrochanteric muscles* – m. piriformis, m. gemellus superior et inferior, m. obturatorius internus and m. quadratus femoris;
- **muscle branches** – innervation of mm. glutei;
- **mixed nerves** – innervation of the muscles and skin of the back of the thigh, muscles and skin of the lower leg and leg.

Superior gluteal nerve (L4–S1)

The motor nerve, which after exiting the plexus passes through the *foramen suprapiriforme*. It goes together with *a. et v. glutea superior* and enters between mm. glutei.

Innervation area

N. gluteus superior **motorically** innervates m. gluteus medius, m. gluteus minimus and m. tensor fasciae latae.

Inferior gluteus nerve (L5–S2)

N. gluteus inferior is mainly a motor nerve. After exiting the plexus, it passes together with *a. and v. glutea inferior* through the *foramen infrapiriforme*.

Innervation area

1. **motorically** – m. gluteus maximus
2. **sensitive** – the back part of the hip joint capsule

Posterior femoral cutaneous nerve (S1-S3)

It is a sensitive nerve that, after exiting the plexus, passes through the *foramen infrapiriforme* – medially from the n. ischiadicus – under the gluteus maximus m. It continues along the back of the thigh to the *fossa poplitea*.

Innervation area

N. cutaneus femoris posterior **sensitively** innervates the skin in the lower part of the gluteal region, the skin in the posterior femoris region, the skin of the perineum, the back and lateral parts of the scrotum, or the labia majora.

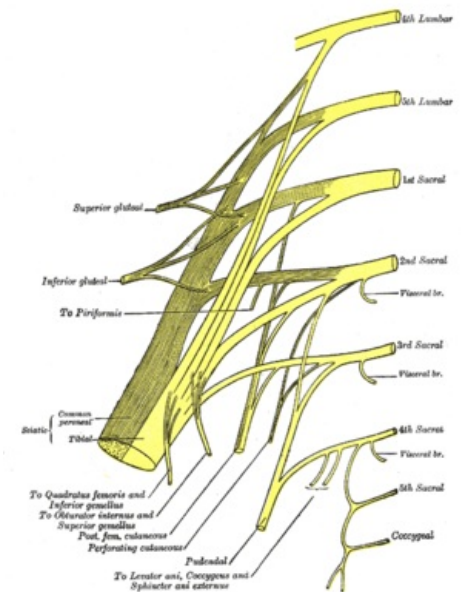
Branches

- **nn. clunium inferiores** – 2–3 sensitive nerves innervating the buttocks
- **rr. perineales** – several branches going in the groove between the thigh and the perineum - *sulcus femoroperinealis* - forward to the skin of the perineum and to the back and lateral parts of the scrotum in men or the labia majora in women
- **rr. cutanei** – branches of the nerve on the back of the thigh that innervate the skin in the regio femoris posterior

Schiadic Nerve (L4–S3)

N. ischiadicus' (L4–S3) is a mixed nerve and at the same time the largest nerve in the human body. After exiting the plexus, it passes through the *foramen infrapiriforme* – externally from the *n. cutaneus femoris posterior* – to the back of the pelvis under the m. gluteus maximus.

- Beneath the lower edge of the gluteus maximus muscle and externally from the ischiatic tuber, the nerve is



Plexus sacralis

covered only by fascia for 1-2 cm and is thus accessible to palpation or therapeutic stimulation

Next, it enters under the long head m. biceps femoris and descends on the surface m. adductor magnus towards the popliteal fossa. It is divided into n. tibialis and n. fibularis communis at different levels.

- In 20% of cases it divides high above the popliteal fossa.

Branches

- muscle branches from the tibial side – for caput longum musculi bicipitis femoris, m. semitendinosus, m. semimembranosus and for part of m. adductor magnus
- muscle branches from the fibular side – for caput breve musculi bicipitis femoris
- sensitive branches - for hip and knee joints

Nerve pudendus (S2–S4)

N. pudendus is a nerve from the lower part of the sacral plexus.

- Along with it, parasympathetic fibers for the pelvic organs and for the external genitalia (especially for the corpora cavernosa) exit from the sacral spinal cord – i.e. **visceromotor** fibers

After exiting the plexus, the nerve goes into the *foramen infrapiriforme* and together with the *a. et v. pudenda interna* leaves the cavity of the small pelvis. Along the way, it sends muscle branches for the muscles of the pelvic floor – m. levator ani and m. coccygeus.

After exiting the foramen infrapiriforme, the nerve wraps around the sciatic spine and enters through the *incisura ischiadica minor* back into the small pelvis, but under the muscles of the pelvic floor. Thereby it enters the *fossa ischiorectalis* and runs forward along the side wall of this fossa - i.e. on the m. obturator internus (on its fascia) - together with a. et v. pudenda interna. It is covered by a reinforced duplication of the obturator internus fascia, which creates a *canalis pudendalis* - **Alcock's canal** for vessels and nerves. In the neurovascular bundle of the canal, the nerve is the most medial. The neurovascular bundle then continues forward and on the back side of the *diaphragma urogenitale* enters above the diaphragma urogenitale and along the lower shoulder of the pubic bone and below the symphysis continues to the dorsum of the penis / clitoridis.

Branches

nn. rectales inferiores

Branches from **S3 and S4** go to the anus. They run across the *fossa ischiorectalis* and innervate:

- **motorically** – m. sphincter ani externus
- **sensitive** – the skin around the anus

nn. perineales

They contain two groups of branches:

- **rr. musculares** - branches for the muscles of the perineum - m. transversus perinei profundus, [[musculus transversus perinei superficialis|m. transversus perinei superficialis]], m. bulbospongiosus, m. ischiocavernosus
- **nn. scrotales / labiales posteriores** - sensitive branches to the scrotum / labia majora

n. dorsalis penis / clitoridis

The paired nerve passing under the symphysis and under the *ligamentum arcuatum pubis* on the dorsum of the penis / clitoridis is the final branch of the n. pudendus. The nerve conducts both **somatomotor** and **somatosensory** fibers for muscles and skin. It also contains **visceromotor** fibers - *parasympathetic* fibers from the sacral parasympathetic, to which are also connected *sympathetic* fibers from the connections of the plexus sacralis with the truncus sympathicus - for erectile bodies. It innervates:

- **sensitive** – the skin of the penis (clitoris) and the mucous membrane of the urethra
- **motorically** – muscles of the perineum and m. sphincter ani externus
- **visceromotorically** – vessels in the corpus cavernosum, the corpus spongiosum, the bulbus vestibuli and other components of the erectile structures

Damage

Poškození n. pudendus vede k částečné inkontinenci moče a stolice, ke snížení citlivosti inervovaných částí kůže a k sexuálnímu poruchám.

Links

Related Articles

- Tibial Nerve
- Communis fibular nerve
- Schiadic nerve

References

- ČIHÁK, Radomír. *Anatomie III*. 1. edition. Grada, 1997. 672 pp. ISBN 80-7169-140-2.