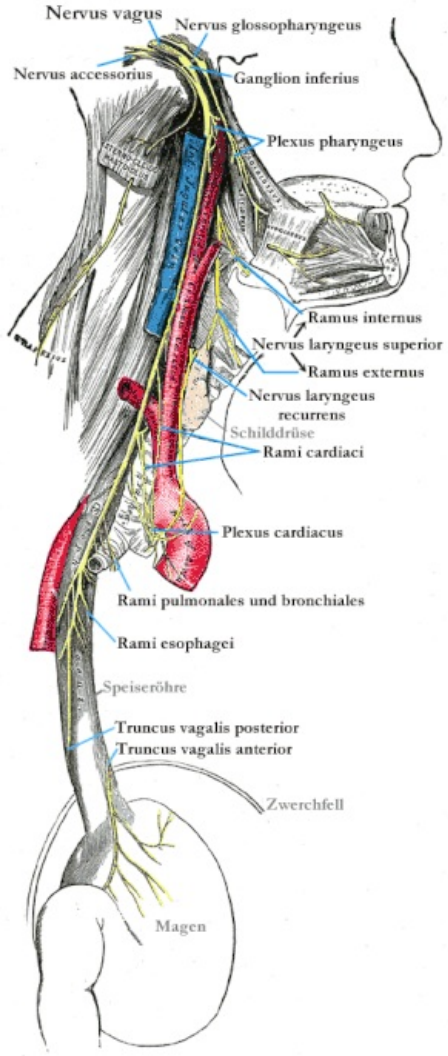
Vagus nerve

Nervus vagus, vagus nerve, n. X is the largest part of the lateral mixed system. It is a **mixed** nerve - it contains fibers of *visceromotor, somatomotor, somatosensitive, viscerosensitive and taste fibers*. It conducts parasympathetic fibers to the organs of the thoracic and abdominal cavity and thus complements the head and sacral parasympathetic.



n. X. exit from the skull and course

Inervation

- ***Somatomotorically*** *participates in the innervation of the pharynx and larynx muscles, together with the* n. glossopharyngeus *muscles of the soft palate (outside* m. tensor veli palatini - n. mandibularis*).*
- ***Visceromotorically*** *(parasympathetic)* the vagal branches go as preganglionic fibers to the ganglia which are located near the organs. These are the organs in the chest and abdominal cavity. The structures themselves are connected and innervated in the ganglia.
- ***Somatosensitive*** *fibers arrive at the root of the tongue and, to a small area of the back and lower wall of the external auditory canal and the upper part of the pinna, they are axons of perikarya located in the* ggl. superius n. vagi*.*
- ***Viscerosensitively****, afferent fibers go to the pharynx, larynx and organs of the chest and alimentary canal, up to the Cannon-Boehm point. They are also important in reflexes and signals of a complex nature (nausea, hunger). Axons end in the* nucleus tractus solitarii *under the base of the 4th ventricle.*
- ***Sensorically****, the n. vagus innervates the landscape of the* epiglottis *and the glossoepiglottic area.*

Cores

The cores of n. X are common to the entire lateral mixed system.

- ***Nucleus ambiguus*** – somatomotor nucleus for n. IX and X.
- ***Nucleus posterior nervi vagi*** *- visceromotor nucleus whose cranial part is called* ***nucleus salivatorius inferior****.*
- ***Nucleus tractus solitarii*** *- viscerosensitive nucleus. Its cranial part is called* ***nucleus gustatorius****.*
- **Somatosensitive fibers** do not have a separate nucleus.

Tribe Progress

It emerges from the brainstem under the exit of the *n. glossopharyngeus*. It goes through the *cisterna cerebellomedullaris lateralis*. It exits the skull through the *foramen jugulare*. Here are the ganglions on the nerve trunk: **ganglion jugulare** and **ganglion nodosum**.

It then continues its course in the neurovascular bundle of the neck − dorsally between the *a. carotis interna*, more caudally *a. carotis communis* and *v. jugularis interna*. The nerve continues to the right in front of the *a. subclavia*, runs along the side of the *arcus aortae* to the left and enters the esophagus in the posterior mediastinum.

It twists around the esophagus to form ***n. vagus dexter*** (on the back side of the esophagus) ***et sinister*** (on the front side of the esophagus).

The *N. vagus dexter* descends in front of the *a. subclavia dx.*, lies behind the *v. brachiocephalica dx.*, and to the right of the trachea.

N. vagus sinister descends between *a. carotis communis sinistra* and *a. subclavia*, behind *v. brachiocephalica sin.*.

Both nerves branch further and form the **esophageal plexus**. Before entering the hiatus oesophageus *of the diaphragm, it gives rise to the vagales anteriores et posteriores* trunks. After passing through the diaphragm, the nerve continues to branch. It enters the *plexus coeliacus* from which the branches of n. X for individual organs of the abdominal cavity come out.

Branches

1. ***r. meningeus*** *- from the ganglion superior nervi vagi and returns through the foramen jugulare to the skull, where it innervates the* ***dura mater***
2. ***r. auricularis*** *– ganglion superius and connects with a branch from ggl. inferius n. glossopharyngei, enters the canaliculus mastoideus, crosses the canalis facialis inside the os petrosum, exits the skull through the fissura tympanomastoidea, goes to the external ear canal and divides into 2 branches*
3. ***rr. pharyngei*** – from m. constrictor pharyngis medius caudally, with fibers n. IX forms the *plexus pharyngeus* - motor and autonomic nerve fibers, one part branches in the submucous ligament and the other in the muscle
4. ***rr. glomi carotici*** - fibers entering the n. IX branch for **sinus caroticus and glomus caroticum**
5. **n. laryngeus superior** - from the lower ganglion goes along the pharynx to the large horns of the tongue, where it divides:
   - *r. internus* – a *sensitive* branch for the upper part of the larynx and the area of the glossoepiglottis, enters the larynx through the opening in the membrana thyrohyoidea (or another close connection)

Cranial branches innervate the mucous membrane of the pharynx, epiglottis and vestibulum laryngis. The caudal branches form a *Galens anastomosis* with the inferior laryngeal n.

1.
   - *r. externus* – the *motor* branch goes to a. thyroidea superior to innervate the **m. cricothyroideus** and the muscles of the pharynx, it also leads autonomic branches for glandula thyroidea
   - *6. n. laryngeus recurrentens* **– motor *fibers for the muscles of the larynx and* sensitive *for its mucous membrane, on the right passes*** *under a. subclavia dx.* and on the left **under the arcus aortae**, it returns cranially between the trachea and the esophagus. Here he broadcasts:
   - rr. tracheales
   - rr. oesophagei
   - rr. pharyngei
   - **7. n. laryngeus inferior** - *motorically* innervates the muscles of the larynx **outside the m. cricothyroideus**, *sensitively* the mucous membrane of the larynx; anastomoses with superior laryngeal nerve (see above)
   - ***8. rr. cardiaci*** - *parasympathetic* and *sensitive* fibers, with sympathetic fibers form the *plexus cardiacus,* enter through the apertura thoracis superior into the chest
   - rr. cardiaci superiores - below the distance of the superior laryngeal nerve
   - rr. cardiaci inferiores – in front of or on the sides of the brachiocephalic artery on the right and left under the left side of the arcus aortae
   - rr. cardiaci thoracici
   - **ganglion cardiacum** (Wrisbergi) – ganglion at the concave arch of the aorta
   - ***9. rr. bronchiales*** below the outlet of the recurrent laryngeal nerve, bronchoconstriction
   - ***10. rr. pulmonales*** - formed by the sympathetic fibers of the "plexus pulmonalis" and the sensitive innervation of the pleura (surgery)
   - ***11. plexus oesophageus*** - the left vagus nerve branches more on the front side, the right one more on the back, the more caudal ones become the "truncus vagalis anterior et posterior*" which run along the front and back wall of the stomach and send branches to the surrounding nerve plexuses and ganglia and to the organs of the abdominal cavity*
   - ***12. rr. gastrici anteriores et posteriores***
   - ***13. rr. hepatici*** - to the liver along a. hepatica communis/propria
   - ***14. yy renales*** - **plexus renalis**
   - ***15. rr. coeliaci*** - from the truncus vagalis posterior, branches entering the *plexus coeliacus*, the viscerosensitive, parasympathetic and sympathetic fibers continue along the vessels to all abdominal organs after **flexura coli sinistra − Cannon-Boehm point**, another part of the colon receives parasympathetic fibers from the sacral parasympathetic

Links

Related Articles

- Sympathetic trunk
- Parasympathetic
- Reflex
- Bulbar syndrome

External links

- Nervus vagus (Czech Wikipedia)
- Vagus nerve (English Wikipedia)

References

- ČIHÁK, Radomír. *Anatomy 3.* 2. edition. Grada Publishing a. s., 2004. 692 pp. pp. 491-503. ISBN 80-247-1132-X.