Facial nerve palsy

The facial nerve is a mixed nerve that has a somatomotor, visceromotor, sensory and sensory component. It is divided into n. facialis and n. intermedius.

Anatomical - physiological notes

Knowledge of anatomical conditions is very important. Disruption of various structures subsequently characterizes the clinical picture of paresis.

The facial nerve emerges anterolaterally from the pontocerebellar angle and enters the meatus acusticus internus. *Lateral to it is the n. VIII. N. intermedius passes between n. facialis and n. VIII.*

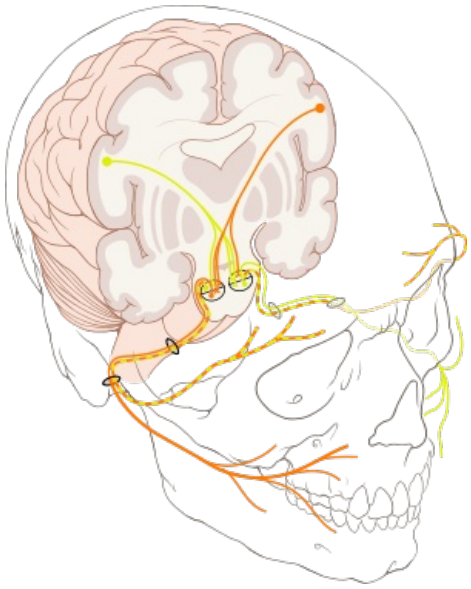
In the meatus acusticus internus it passes above in front, here it is **vascularly supplied** through a. labyrinth (from a. cerebelli inferior). Inside the pyramid, it runs in ***canalis n. facialis*** (Fallopii).

- **Labyrinth section** - goes forward downwards, ends with *ggl. geniculi*.
- **Tympanal section** - turns 75° backwards (in the forward direction the *n. petrosus major* separates with the parasympathetic for the *ggl. pterygopalatinum*), then runs along the medial wall *cavum tympani*.
- **Mastoid section** - the longest, descending and runs dorsally from the external auditory canal, where it gives off 2 branches (*n. stapedius* and *chorda tympani*).

It leaves the bone at the *foramen stylomastoideum* and enters the *glandula parotis*. Here it gives off five main branches (*rr. temporales, rr. zygomatici, rr. buccales, r. marginalis mandibulae and r. colli*).

Tab. 1 – Basic characteristics of the facial nerve

	Innervation	function
Motor skills - upper branch	m. frontalis, corrugator supercilii, nasalis,	eyebrow raising, eyebrow furrowing
	orbicularis oculi	closing the eyelids
	m. stapedius	perception and regulation of sounds
Motor skills - lower branch	m. orbicularis oris, mentalis, buccinator, levator anguli oris, risorius, depressor labi inf., platysma	pursed lips, puffed cheeks, smile, appreciation
N. intermedius	glands of the nasal cavity, nasopharynx, lacrimal and salivary glands	production of tears and saliva of the respective glands
	sensory innervation	small area of the eardrum, external auditory canal, and ear
	taste fibers from anterior 2/3 of tongue	taste anterior 2/3 of tongue



Upper part of face innervated by crossed and uncrossed fibers (yellow + orange), lower part by crossed fibers only

N. facialis

Motor innervation: facial muscles, *m. platysma, m. stapedius, m. stylohyoideus and venter post. musculi digastrici*.
The central motoneuron is located in the lower third of the *gyrus praecentralis*, goes through the *capsula interna*, crosses in the caudal pontine and ends in the nucleus. Some fibers continue caudally, cross again and ascend to a nucleus ipsilateral to the cortex (the so-called '*Déjerin recurrent bundle*).
The *upper half* of the face has fibers from both hemispheres, while the *lower half* has only crossed fibers.

From this it can be concluded that the supranuclear lesion spares the motor skills of the upper part of the face (the patient does not purse his mouth, but moves his eyebrows). Emotional control of facial expressions comes from extrapyramidal structures via the RF. If these pathways are preserved in a supranuclear lesion, the emotional mimicry response is preserved.

N. intermedius

Contains three types of fibers: **afferent somatic** from the back of the external auditory canal and part of the auricle, **sensory taste** from the front 2/3 of the tongue and visceromotor to the gl. submandibularis, *gl. sublingualis*, to the glands in the nose and to the lacrimal gland. The preganglionic fibers of the parasympathetic are from the trunk of the ncl. salivatorius superior (they pass through the ggl. geniculi without connecting), the postganglionic fibers are in the ggl. submandibulare and the pterygopalatinum.

Central lesion

This is damage to the supranuclear pathway. Free expression of the lower half of the face is usually limited, especially periorally. Involuntary facial expressions may be preserved. Atrophy and fasciculation are absent.

Nuclear lesion

Ipsilateral paralysis of all muscles supplied by *n. VII*. It is often affected at the same time *n. abducens and tr. corticospinalis*. Saliva or tear secretion, skin sensitivity or taste may not be affected.

Lesions in the pontine angle

Simultaneously present lesions of n. VIII, possibly other structures, the n. intermedius is also often damaged - a disorder of taste, lacrimal and salivary secretion and sensitivity.

Peripheral lesions

Lesions in canalis *n. facialis*

Lesions in the vestibular section
: Peripheral type paresis, lacrimal and salivary secretion disorder, hyperacusis (stapedius m. does not work), taste disorder, in addition, n. VIII is also usually affected.

Lesion in the tympanic section
: Lacrimal and salivary secretion spared. If it occurs distally behind the stapedius n., hyperacusis is also absent, if it occurs behind the chorda tympani, even taste is spared.

The most common causes of disturbances in the canalis n. facialis are fractures, otitis, mastoiditis, VZV and Bell's palsy. If it is an ear disease, vertigo, otalgia, or perforation of the eardrum may also be present. At the same time, n. VIII in the bridge of the cerebellum can also be disturbed.

Idiopathic Bell's palsy

It is manifested by the involvement of the upper and lower branches of one side of the face. It is the most common cause of facial nerve palsy (¾ of cases). Apparently, it arises on the basis of non-purulent inflammation of the nerve above the *foramen stylomastoideum*, but the exact etiology is unknown (compression of the *vasa nervorum*, reactivation HSV).

Bell's palsy

Facial lesions

Disorders of the nerve in the foramen stylomastoideum and in the gl. parotid lead to a purely motor mimic paralysis of half of the face. The most common causes include trauma, inflammation and tumors of the gl. parotid gland and surgical procedures in this area. Manifested by lagophthalmos, the eye turns upwards and outwards when trying to close. There is also a smoothed nasolabial fold, a drooping corner, it is impossible to purse the lips, value the teeth, etc.

Diagnosis

The following examinations are recommended when facial nerve palsy is detected:

- Blood examination – blood count, inflammatory markers (CRP), Lyme disease serology;
- ORL statim - finding out whether there is a herpetic infection of the ear drum;
- CT scan of the brain – it is not necessary immediately, but it should also be performed in case of peripheral paralysis;
- Lumbar puncture - always in children, in adults in cases of clinical doubt or high suspicion of Borrelia infection.

Treatment

This article contains probably doubtful information.

The article "Facial nerve palsy" contains probably doubtful information. More detail information can be found on its talk page.

Vitamin B, eye drops or ointment, possibly also taping the eye at night (prevention of drying of the cornea). Rehabilitation – prevention of dyskinesias, the patient is taught how to hold the corner correctly. Acyclovir (Herpesin) – for five days, to be sure, possibly corticoids, but not from the first day. Acupuncture (EBM?!) – as soon as possible, combined with rehabilitation. Surgical interventions – static adjustments to the position of the corner and the tension of facial muscles, facial reanimation, surgery on the facial nerve.

Links

External links

Treatment of facial nerve palsy (http://www.obrna-licniho-nervu.cz/lecba-obrny-licniho-nervu/)

Related Articles

- Facial nerve
- Facial Hemispasm
- Trigeminal neuralgia

Source

- BENEŠ, George. *Study Materials* [online]. ©2007. [cit. 2009]. <http://jirben2.chytrak.cz/materialy/orl_jb.doc>.
- Seminar at the Neurological Clinic of the 1st Faculty of Medicine, Charles University in Prague, with MUDr. Eva Krasulová, as part of the course Clinical Neurology and Clinical Psychiatry for the 6th year, taught in November 2011 (Diagnosis and Treatment sections).