ARKANSAS OTOLARYNGOLOGY CENTER

EAR | NOSE | THROAT

Facial Paralysis

Disorders of the facial nerve can occur to men, women, and children, but they are more prominent among men and women over 40 years of age, people with diabetes, upper respiratory ailments, weak immune systems, or pregnant women. Cases of facial paralysis can be permanent or temporary, but in all circumstances there are treatments designed to improve facial function.

What is the facial nerve?

The facial nerve resembles a telephone cable and contains 7,000 individual nerve fibers. Each fiber carries electrical impulses to a specific facial muscle. Information passing along the fibers of this nerve allows us to laugh, cry, smile, or frown, hence the name, "the nerve of facial expression."

When half or more of these individual nerve fibers are interrupted, facial weakness occurs. If these nerve fibers are irritated, then movements of the facial muscles appear as spasms or twitching. The facial nerve not only carries nerve impulses to the muscles of the face, but also to the tear glands, to the saliva glands, and to the muscle of the stirrup bone in the middle ear (the stapes). It also transmits taste from the front of the tongue.

Since the function of the facial nerve is so complex, many symptoms may occur when the fibers of the facial nerve are disrupted. A disorder of the facial nerve may result in twitching, weakness, or paralysis of the face, dryness of the eye or the mouth, or disturbance of taste.

How does the facial nerve affect facial expression?

The facial nerve passes through the base of the skull in transit from the brain to the muscles that control facial expressions. After leaving the brain, the facial nerve enters the temporal bone through the internal auditory canal, a small bony tube, in very close association with the hearing and balance nerves. Along its inch-and-a-half course through a small canal within the temporal bone, the facial nerve winds around the three middle ear bones, in back of the eardrum, and then through the mastoid (the bony area behind the part of the ear that is visible). The facial nerve has the longest bony course of any nerve in the body.

After the facial nerve leaves the mastoid, it passes through the salivary or parotid gland and divides into many branches. The facial nerve has four components with several distinct functions: facial expression, taste sensation, skin sensation, and saliva and tear production.

What causes facial paralysis?

Infections, injuries, or tumors can cause facial nerve disorders, but the most common cause of facial weakness is Bell's palsy. This disorder, which often comes on suddenly and reaches its peak within 48 hours, is probably due to the body's response to a virus. When there is a virus, the facial nerve within the ear (temporal bone) swells, and this pressure on the nerve in the bony canal damages it.

The paralysis is likely to affect only one side of the face, but in rare cases it affects both sides of the face at once. Bell's palsy may last from two to three weeks or longer. An early sign of improvement, such as getting a sense of taste back, is often a good indication that there will be a complete recovery.

Facial nerve paralysis following head trauma is not uncommon. If the paralysis begins days after the trauma, the prognosis is good. If the paralysis begins immediately surgery may be indicated once the patient is stabilized.

Facial paralysis may be a byproduct of tumor surgery in the brain, temporal bone or parotid gland. The prognosis depends on the type of tumor and the state of the nerve at the end of the surgery.

How are facial nerve disorders treated?

Since otolaryngologists—head and neck surgeons have special training and experience in managing facial nerve disorders, they are the most qualified physicians to perform an in-depth evaluation of abnormal movement or paralysis of the face. An evaluation will include an examination of the head, neck, and ears, as well as a series of tests.

Some of the most commonly used <u>tests</u> are:

- Hearing Test—Determines if the cause of damage to the nerve has involved the hearing nerve, inner ear, or delicate hearing mechanism.
- Imaging CT (computerized tomography) or MRI (magnetic resonance imaging)—Determines if there is an infection, tumor, bone fracture, or other abnormality in the area of the facial nerve.
- Electrical Test—Stimulates the facial nerve to assess how badly the nerve is damaged. This test may have to be repeated at frequent intervals to see if the disease is progressing.

The results of diagnostic testing will determine treatment. The goal of the treatment is to eliminate the source of the nerve damage. Patients with less nerve damage have better chances of recovery. Medications are often used as part of the treatment.

Treatment options include:

- If infection is the cause, then an antibiotic to fight bacteria (as in middle ear infections) or antiviral agents to fight Shingles (also called Ramsey Hunt Syndrome) may be used.
- If swelling is believed to be responsible for the facial nerve disorder, then steroids are often prescribed.

- In certain circumstances, surgical removal of the bone around the nerve (decompression surgery) may be appropriate.
- Early use of physical therapy may improve long term results. We feel this is very important when the facial paralysis is due to shingles, trauma, surgery, or a severe case of Bell's palsy.

What treatments are recommended for *permanent* facial paralysis?

Patients with a permanent facial paralysis may be rehabilitated through a variety of procedures including:

- Eyelid weights or springs
- Muscle transfers and nerve substitutions
- A special form of physical therapy called facial retraining
- Weakening the paralysis by chemical injection

How does the facial nerve affect the health of the eye?

Remember, when the facial nerve is paralyzed, considerable attention must be given to maintaining a healthy eye through a constant flow of tears. Tears are spread out over the eye by blinking. Since blinking is diminished or eliminated when facial nerve paralysis is present, special care must be given to prevent drying, erosion, and ulcer formation on the cornea which may result in possible loss of the eye. We have special eye patches that help retain moisture over the cornea and protect the eye. Use of gauze patches should be avoided as they will cause scratches on the cornea. Uses of lubricating drops or ointments will help keep the cornea from drying.