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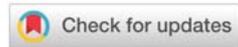
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Review Article

Peripheral facial paralysis

Abstract

Peripheral facial paralysis causes asymmetry of the face affecting the upper and lower territories. Its management requires the completion of an initial clinical assessment in order to specify the topography, the severity of the involvement, the etiological nature and the possible complications. The knowledge and the mastery of the anatomo-physio-pathological bases makes it possible to understand the different clinical pictures.

The rehabilitation must be started as early as possible, to accompany the various stages of sensitive-motor recovery. It must be performed by a multi-disciplinary team consisting of a physical and rehabilitation doctor, a neurologist, an otolaryngologist, a plastic surgeon, a physiotherapist, a speech therapist and a psychologist whose role is to help the patient to accept the self-image, to recover confidence and self-esteem and to encourage the resumption of socio-cultural-professional activities.

Introduction

Peripheral facial paralysis is a relatively common pathology requiring a specific diagnostic and therapeutic attitude. Its incidence is estimated at about 0.5 per 1000. The causes are varied but they are most represented by the idiopathic Charle Bell paralysis whose frequency can reach 50 to 70% of the cases [1].

Peripheral facial paralysis causes asymmetry of the face affecting the upper and lower territories. Its management requires the completion of an initial clinical assessment in order to specify the topography, the severity of the involvement, the etiological nature and any complications [2].

Faced with the functional and especially psychic repercussions, this pathology, often neglected, requires a comprehensive care involving physicians of different specialties: the otolaryngologist, the ophthalmologist, the neurologist, the psychologist and the physical physician and rehabilitation whose role is to direct the recovery of motor activity and avoid or at least minimize the sequelae [3].

This care must be put in place from the beginning to achieve a therapeutic project with setting objectives to be achieved and choice of means and appropriate techniques.

Anatomical reminder

Peripheral facial paralysis corresponds to the sensory-motor deficit of the facial nerve (7th cranial pair).

This mixed nerve is composed of two roots:

Motor, responsible for the innervation of the facial muscles.

Sensitive, sensory and secretory at the origin of the intermediate bronchus of Wrisberg.

The grouping of these roots is only part of the path of the nerve.

Thus, the facial nerve is essentially formed of motor fibers and provides three functions:

- A motor function at the base of mimicry and motricity of the facial muscles.
- Sensitive-sensory function at the origin of gustation and superficial sensitivity of the Ramsay Hunt area [4].
- A vegetative or secretory function (para-sympathetic system) of the lacrimal and salivary glands [4].

The facial nerve originates within the protuberance, crosses the ponto-cerebellar angle in the direction of the internal auditory canal, with a path called "bayonet" in the rock to the stylomastoid foramen at the base of the skull and then branched into the parotid gland where it ends at the level of the facial muscles [5].

Positive diagnosis

Generally it is obvious when the patient presents himself in consultation with an asymmetry of the face, permanent opening of the eye of the affected side and important deviation of the mouth [6].

The interrogation makes it possible to determine:

Triggers, infectious (otitis), inflammatory, autoimmune, tumor, post-traumatic or post-surgical.

Installation mode (acute or chronic).

The functional signs of neurological order and the repercussion of these dysfunctions.

Physical examination:

At the inspection, the features of the face are deviated from the healthy side.

At rest, the face of the patient with peripheral facial palsy is characterized by:

- A sluggish hemiface,
- A lowered commissure,
- An erased nasolabial fold,
- Retracted palpebral fissure,
- Frontal wrinkles absent.

With the mimicry, all the signs are accentuated and the patient is incapable of inflating the cheeks, to whistle or to blow correctly. (Figures 1,2)

He finds an important gene for chewing with impossibility of closing the eye of the affected side.

The sensitivity of the cheek is preserved unless the injury is located above the tympanic cord where there is a disturbance of taste affecting the two previous shots of the tongue.

For the sensitivity of the Ramsay Hunt area, it is only exceptionally affected.

As for the vegetative function of the facial nerve, secretory dysfunction of the lacrimal and salivary glands depends on the lesion level.

Muscular testing may be performed in addition to the clinical examination in order to assess the severity of the initial attack and to follow the evolution.

The most used is the Freyss muscle testing which tests ten medial and lateral muscle groups E: 0: no contraction, 3: normal contraction.



Figure 1: 57-year-old patient at 1 month of peripheral facial palsy.



Figure 2: 21 years old to 03 years of peripheral facial paralysis.

At the end of the testing, we obtain a score out of 30 giving an idea of the prognosis.

For a better initial evolution and that of the follow-up, one can couple with the muscular testing of Freyss, the Grading of House and Brack-Mann, simple and fast [6], classifying the peripheral facial paralyzes in 6 grades:

- I: normal function
- III: ocular closure if forced contraction
- IV: palpebral closure impossible
- VI: total paralysis.

Otoscopy is an integral part of the clinical examination, exploring the external auditory meatus and tympanum on both sides.

The other cranial pairs and the complete neurological examination are obligatory to the claim of the physical signs that can accompany the facial paralysis of central origin.

Para-clinical examination:

They are considered necessary for the topographical and etiological identification of the lesion.

Biologically:

Balance sheets are prescribed according to the clinical orientation:

- Inflammatory assessment: Count-blood formula, sedimentation rate, C-reactive protein,
- Immunological balance: auto-immune antibodies,
- Biochemistry: especially fasting glucose,

- Infectious assessment: virological, bacteriological ... (Lyme serology, HIV ...),
- Lumbar puncture with biochemical, cytobacteriological and other investigations.

Radiologically:

Tomodensitometry of the rock: especially before the post-traumatic otological signs.

Magnetic resonance imaging: in front of signs of progressive installation and if elements in favor of a tumor etiology.

On the functional level: we quote essentially [8-12]:

Total linear audiometry

Study of the stapedial reflex

Schirmer test

Blatt test and electrogustometry

Hilger excitability test, electroneurography or electromyography.

An ophthalmologic consultation is necessary before eyelid inoculation to avoid the dreadful complications such as keratitis.

An otorhinolaryngological consultation is indicated in case of suspicion of pathology of the middle ear.

Etiological diagnosis of peripheral facial palsy: [4]

- Idiopathic: Frontal facial paralysis (Bell's palsy)
- Infectious; Viral Herpes zoster, herpes, HIV, cytomegalovirus, Epstein-Barr virus, poliovirus, influenza, mumps, coxsackie
- Bacterial Lyme disease, cephalic tetanus, syphilis, leprosy, meningeal tuberculosis, cat scratch disease
- Tumor Tumor of the pontocerebellar angle (neuroma, meningioma), brainstem glioma, skull base tumors, cholesteatoma, carcinomatous meningitis
- Traumatic fractures of the rock, penetrating wounds, operative trauma of the middle ear, acoustic neuroma surgery or parotid surgery
- Metabolic: Diabetes, porphyria
- Vascular: Vascular accident of the brainstem (attack of the motor nucleus)
- Iatrogens Injection of botulinum toxin for therapeutic purposes (hemifacial spasm, blepharospasm) or cosmetic surgery
- Toxic Lead, alcohol, ethylene glycol, carbon monoxide, arsenic
- Miscellaneous: Sarcoidosis (Heerfordt syndrome),

Guillain-Barré syndrome (bilateral), multiple sclerosis (rare)

- Congenital: Moebius syndrome (exceptional)
- Melkersson-Rosenthal syndrome (exceptional).

Differential diagnosis

Represented mainly by:

Central facial paralysis: characterized by a predominant facial asymmetry in the lower territory, sparing the superior territory of the face. It is accompanied by neurological signs with dissociation of the automatic-voluntary motricity.

Constitutional facial asymmetry: eliminated at the end of a well conducted interrogation [6].

Evolution:

Peripheral facial palsy can heal without sequelae in 80% of cases [8-12].

The factors of good prognosis are:

- Moderate paralysis grade IV of House.
- Freyss® 10/30 muscle testing.
- A normal Schirmer test.
- A stapedial reflex test.
- The age of the patient <60 years old.
- Early care.
- Rapid clinical recovery.

Complications and sequelae

Ocular complications: mainly represented by keratitis due to palpebral inoclusion with decrease or absence of lacrimal secretions exposing the cornea to this risk which increases from J15 of the motor deficit. This underlines the interest of preventive treatment based on occlusive dressing and moistening eye drops.

Intrinsic complications:

- Persistent dysgeusia.
- The syndrome of crocodile tears following food intake.
- Post-paralytic hemifacial spasm, which corresponds to hypertonia responsible for permanent and painful contracture, myokimias, fasciculations and syncinesis.
- Sequential dysarthria.

Therapeutic care:

The treatment consists of two parts:

- Etiological treatment adapted to the origin of this peripheral facial paralysis.

- Symptomatic treatment:
- Preventive: artificial tears, nocturnal eyelid occlusion, ophthalmological follow-up.
- Rehabilitative.
- Psychological: moral support and self-acceptance.

Rehabilitative management: [3]

Before establishing the therapeutic project, it is necessary to describe the broad assessment guidelines in rehabilitation that are based essentially on:

- The history
- Clinical evaluation: functional signs, physical signs
- Instrumental evaluation, in addition to Freyss muscle testing, and House and Brackmann's classification, the Short Form Health Survey (SF-36) or Derriford Appearance Scale 59 (DS-59), provide on the psychic and functional impact of peripheral facial paralysis on everyday life.

Once the assessment is complete, the data will make it possible to set the objectives and choose the means adapted to each case.

Rehabilitation techniques differ according to the evolutionary clinical stage of paralysis, so we distinguish: [3]

- Flaccid paralysis
- Spastic paralysis
- The operated paralysis

At the stage of flaccid paralysis, which corresponds to the first days of facial paralysis, the contralateral hemiface is favored with gentle massage, light movements and prevention of co-contractions.

From the onset of spasticity, the work is directed towards deep massages with control of abnormal movements, especially syncynies that correspond to the co-contraction of different muscle groups during voluntary movements.

The feedback system keeps an important place in this step 1 [3].

As for the operated paralysis, the adapted protocol is chosen according to the surgical procedure.

Massages: offered during flaccid and spastic paralysis courses including:

A decontracting massage going in the direction of the muscular fibers.

Stretch followed by slow relaxations.

A superficial soft massage.

A compressive massage on the pain points especially.

Muscular work:

Muscular work is for the facial muscles; he interests

- An upper zone: front-eye.
- An average area: nose-cheek.
- A lower area: mouth-chin-neck.

There are several types of mobilization:

Passive mobilization: the masso-physiotherapist carries out movement movements of the facial muscles, preferably in front of the mirror in order to control the hyperactivity of the side not reached.

Assisted auto-mobilization: started when a muscular contraction is perceived with the help and direction of the physiotherapist.

Active mobilization but assisted by the physiotherapist who controls the effort provided by the patient.

Active mobilization when the patient manages to contract the movements and control the activity itself.

Active mobilization against resistance: same previous exercise with application of progressive resistance [3].

Muscular work should be done with caution, avoiding skipping the steps to prevent the onset of co-contractions.

Sensory stimulation should accompany muscle strengthening because of its stimulating effect on the afferent pathways.

The mental imagery preceding and associated with mobilization still gives much more satisfactory results on motor recovery.

When the peripheral facial palsy takes time to recover, or if the form is severe from the outset, one is exposed to co-contractions involving all the hemiface reached up to the chin and the neck.

These co-contractions are extremely embarrassing and their disappearance remains a challenge.

The management of these sequelae must be started early and preferably in front of the mirror [3].

The exercises include relaxation and general relaxation, proper breathing work and a deep massage.

The inhibition of these co-contractions is done by asking the patient to focus on the spasm during the execution of the light movements and which last ten seconds, or until the disappearance of the spasm. This exercise is repeated after a time of rest and relaxation. It becomes more and more fast and easy with good muscle control from which the progressive disappearance of spasms.

In some cases of hypertonia, the injection of botulinum toxin may be proposed.

Physiotherapy, mental imagery and electrostimulation of afferent pathways can be offered as therapeutic adjuvants, always informing the patient about the project and the purpose of the applied techniques.

The mirror effect is a method of rehabilitation that consists of reinforcing the cortical control of the smile by performing a set of movements in front of a monitor coupled with a camera associated with an image processing software rendering in real time the patient's face. . The patient is called to perform five movements every day for fifteen minutes:

Smile closed, open smile, lip protraction, squint and squint.

With this method, the patient looks at the image of his reconstructed face with symmetrical features and normal mimicry.

Mental imagery can be combined with this method of rehabilitation to enhance cortical activity.

It is therefore a positive feedback technique for treating the afferent and efferent pathways in order to recover a symmetrical smile.

Also in the context of the rehabilitation of spasms, the electromyographic Biofeedback method remains very useful, with or without injection of botulinum toxin to reduce co-contractions.

Thanks to the electrodes placed on the hemiface, we can determine the muscle to be treated.

It is a powerful technique for evaluating muscle strength before and after toxin injection, thanks to the stimulating effect that plays a significant role in visual and audible feedback [13-14].

In the case of definitive peripheral facial paralysis, the surgical indication is posed in different modalities followed by a re-education aimed at

- restore facial movements especially labial and palpebral
- develop muscle automation
- strengthen the cortical control of the smile.

Conclusion

Peripheral facial paralysis is a common reason for consultation in physical medicine and rehabilitation. The knowledge and the mastery of the anatomo-physio-

pathological bases makes it possible to understand the different clinical pictures.

The management and especially rehabilitation should be started as early as possible, to accompany the various stages of sensitive-motor recovery. It must be performed by a multi-disciplinary team consisting of a physical and rehabilitation doctor, a neurologist, an otolaryngologist, a plastic surgeon, a physiotherapist, a speech therapist and a psychologist whose role is to help the patient to accept the self-image, to recover confidence and self-esteem and to encourage the resumption of socio-cultural-professional activities.

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