PRACTICE OF MEDICINE

Presentation on Bell's Palsy

-by dr. SHIVANI TOSHNIWAL
CRANIAL NERVES

There are 12 pairs of cranial nerves:

I. = Olfactory
II. = Optic
III. = Oculomotor
IV. = Trochlear
V. = Trigeminal
VI. = Abducent
VII. = Facial
VIII. = Vestibulocochlear
IX. = Glossopharyngeal
X. = Vagus
XI. = Accessory
XII. = Hypoglossal
MOTOR NEURONS

There are 2 types of motor neurons in our body:

- **UPPER MOTOR NEURON** :- These are the neurons in the higher centers of brain which control lower motor neurons.

- **LOWER MOTOR NEURONS** :- These are the anterior grey horn cells in the spinal cord and the motor neurons of cranial nerve nuclei situated in the brain stem, which innervate the muscles directly. So, these neurons constitute `final common pathway` of motor system.
# EFFECTS OF THE LESIONS IN THE MOTOR NEURONS

<table>
<thead>
<tr>
<th>EFFECTS</th>
<th>UPPER MOTOR NEURON LESION</th>
<th>LOWER MOTOR NEURON LESION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Muscle Tone</td>
<td>Hypertonia</td>
<td>Hypotonia</td>
</tr>
<tr>
<td>2. Paralysis</td>
<td>Spastic type</td>
<td>Flaccid type</td>
</tr>
<tr>
<td>3. Wastage of Muscle</td>
<td>Occurs</td>
<td>Occurs</td>
</tr>
<tr>
<td>4. Superficial Reflexes</td>
<td>Lost</td>
<td>Lost</td>
</tr>
<tr>
<td>5. Plantar Reflexes</td>
<td>Abnormal plantar reflexes- Babinski sign</td>
<td>Absent</td>
</tr>
<tr>
<td>6. Deep Reflexes</td>
<td>Exaggerated</td>
<td>Lost</td>
</tr>
<tr>
<td>7. Clonus</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>8. Electrical Activity</td>
<td>Normal</td>
<td>Absent</td>
</tr>
<tr>
<td>9. Muscles Affected</td>
<td>Group of muscles</td>
<td>Individual muscle</td>
</tr>
<tr>
<td>10. Fascicular Twitch in EMG</td>
<td>Absent</td>
<td>Present</td>
</tr>
</tbody>
</table>
7TH NERVE
(FACIAL NERVE)
ANATOMIC CONSIDERATIONS OF FACIAL NERVE

- The facial nerve supplies all the muscles concerned with facial expression.
- The sensory component is small; it conveys taste sensation from anterior 2/3 of the tongue.
- After leaving the pons, the nerve enters the internal auditory meatus with the acoustic nerve.
- The nerve continues its course in its own bony channel, the facial canal and exits from the skull via stylomastoid foramen.
- It then passes through the parotid gland and subdivides to supply the facial muscles.
Course of facial nerve

- Supra-nuclear
- Meatal
- Labyrinthine
- Tympanic
- Intra-cranial
- Facial nerve nucleus
- Mastoid
- Extra-temporal

muhadharaty.com
Bell’s Palsy
Bell’s Palsy

- It is the **lower motor neuron lesion** of the 7th (facial) nerve at the stylomastoid foramen within the facial canal resulting in sudden paralysis.

- It is the most common cause of **facial weakness**.

- It affects all ages and both sexes.

- The annual incidence of this idiopathic disorder is ~ 25 per 1,00,000 annually or about 1 in 60 persons in a lifetime.
The condition follows **exposure to cold** and it is thought to be due to an **inflammation of the nerve** in its fibrous sheath within the stylomastoid foramen.

In acute Bell’s palsy, there is inflammation of the facial nerve with the mononuclear cells, consistent with the immune or infectious cause.

**Herpes Simplex Virus (HSV) type 1 DNA** was frequently detected in endoneurial fluid and posterior auricular muscle, suggesting the reactivation of the virus may be responsible for most cases.

**Reactivation of varicella zoster virus** is associated with Bell’s palsy represent the second most frequent cause.
SYMPTOMS

- **Prodromal Symptoms**: Pain behind the ear or referred to occiput region after exposure to cold or without any cause. Weakness worsens for 1-2 days before stabilizing.

- **Main Symptoms**:
  - Mostly the symptoms are *unilateral* and facial weakness occurs rapidly.
  - Spontaneous complaints of loss of sense of taste, hyperacusis, and watering of eyes.
  - Less sweating on affected side.
  - In **severe cases** there is complete immobility of the upper and lower face of affected side and no voluntary or emotional movement is possible.
  - The platysma is commonly paralyzed.
SIGNS

- **Forehead** cannot be wrinkled.
- **Bell’s phenomenon**: on attempting closure, eyeball turns upwards and outwards. Eyes cannot be closed.
- On showing the teeth, the lips do not separate on affected side. Whistling not possible. Articulation of labial components difficult. Naso-labial fold flattened out. Angle of mouth on affected side droops with dribbling of saliva.
- Food collects between teeth and gums. Fluid runs out while drinking.
- Base of tongue lowered.
- The paralysis become most evident when the **patient tries to laugh**; the paralyzed side is stiff and mask-like.
- Speech difficulty.
Smoothing out of forehead

Eyebrow droop

Drooping of corner of mouth

Loss of forehead & brow movements

Inability to close eyes & drooping of eyelids

Loss of nasolabial folds & drooping of lower lip
Bell Palsy

Facial weakness
Drooping
Teariness or dryness
Facial nerve
Pain in or behind the ear
Loss of sense of taste
Drooling
FACIAL NERVE PALSY IN NEW BORN:- The mastoid process is absent in new born and stylomastoid foramen is superficial. Manipulation of baby’s head during delivery may damage 7th nerve. This leads to paralysis of facial nerve especially the buccinator, required for sucking the milk.
<table>
<thead>
<tr>
<th>LEVEL OF LESION</th>
<th>SYMPTOMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesion above the origin of chorda tympani nerve</td>
<td>Bell’s palsy</td>
</tr>
<tr>
<td></td>
<td>Loss of taste from anterior 2/3 of the tongue.</td>
</tr>
<tr>
<td>Lesion above the origin of nerve to stapedius</td>
<td>Loss of lacrimation.</td>
</tr>
<tr>
<td></td>
<td>Loss of stapedial reflex.</td>
</tr>
<tr>
<td></td>
<td>Hyperacusis.</td>
</tr>
<tr>
<td>Lesion above the origin of greater petrosal nerve</td>
<td>Loss of lacrimation.</td>
</tr>
<tr>
<td></td>
<td>Loss of stapedial reflex.</td>
</tr>
<tr>
<td></td>
<td>Loss of taste</td>
</tr>
<tr>
<td></td>
<td>Lack of salivation</td>
</tr>
<tr>
<td></td>
<td>Bell’s palsy</td>
</tr>
<tr>
<td>Lesion above stylomastoid foramen</td>
<td>Bell’s palsy</td>
</tr>
</tbody>
</table>
1. Loss of lacrimation
2. Loss of stapedial reflex
3. Loss of taste from anterior 2/3rd of tongue
4. Lack of salivation
5. Paralysis of muscles of facial expression (Bell's palsy)

Fig. 24.43: Symptoms according to the level of injury to cranial nerve VII
COMPLICATION

- Bell’s palsy is a self-treatable disease, generally it resolves itself in 3-4 weeks or months.
- If the peripheral facial palsy has existed for sometime and recovery of motor function is incomplete, a continuous diffuse contraction of facial muscles may appear. Synkinesis or hemifacial spasm can occur.

- Anomalous regeneration of nerve fibers may result in:
  1. Closure of lids may cause retraction of mouth if fibers innervate the orbicularis oris.
  2. If fibers innervate the lacrimal gland, anomalous tearing (crocodile tears) may occur with any activity of facial muscles.
  3. Another synkinesia is triggered by jaw-opening causing closure of eyelids on the side of facial palsy.
INVESTIGATIONS

1) There is mild cerebrospinal fluid lymphocytosis.

2) MRI – reveals swelling and uniform enhancement of geniculate ganglion and in some cases entrapment of the swollen nerve in the temporal bone.

3) Absence of cutaneous lesions of herpes zoster in the external ear canal.

4) A normal neurological examination with exception of the facial nerve.

5) Electromyography may help in prognosis.
DIFFERENTIAL DIAGNOSIS

Bell’s palsy can be differentiated with following diseases:

1. Supranuclear lesion of facial nerve
2. Ramsay-Hunt syndrome
3. Lyme Disease
4. Leprosy
5. Guillain-Barre Syndrome
6. Melkersson-Rosenthal Syndrome
7. Hemifacial Spasm
8. Facial Hemiatrophy
9. Moebius Syndrome
<table>
<thead>
<tr>
<th>SUPRANUCLEAR LESION OF FACIAL NERVE</th>
<th>HEMIFACIAL SPASM</th>
<th>FACIAL HEMATROPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Caused by <strong>occlusion of small penetrating arteries</strong> providing blood to brain’s deep structure affecting fibers in the internal capsule going to facial nucleus.</td>
<td>1. Caused by <strong>vascular compression of exiting facial nerve in the pons</strong>. It can also develop as sequela of bell’s palsy or secondary to compression or demyelination of nerve.</td>
<td>1. Its cause is unknown. Occurs mainly in women. <strong>It is slowly progressive disease.</strong></td>
</tr>
<tr>
<td>2. Paralysis of only <strong>lower half of facial muscles on the contralateral side</strong> occurs.</td>
<td>2. Patient <strong>face painless irregular involuntary contractions on one side</strong> of face.</td>
<td>2. Characterized by <strong>disappearance of fat in dermal and subcutaneous tissues on one side of face.</strong></td>
</tr>
<tr>
<td>3. Most patients <strong>lost voluntary control of muscle movement in face</strong>, however muscles in the face involved in the spontaneous emotional expression remain intact and patient also have difficulty in communication.</td>
<td>3. In its advanced form, the affected side of the face is <strong>gaunt and skin is wrinkled and brown</strong>. Facial hair may turn white and fall out and sebaceous gland become atrophic. <strong>Bilateral involvement may occur</strong></td>
<td></td>
</tr>
</tbody>
</table>
Clinical Appearance of Hemifacial Atrophy

- Note, hollowing of the cheek & atrophy of jaw bones of the affected side.

Fig. 2.21: Supranuclear lesion of right facial nerve
Central facial palsy

Preservation of forehead & brow movements

Loss of nasolabial folds & drooping of the lower lip

Peripheral facial palsy

Loss of forehead & brow movements

Inability to close eyes & drooping of eyelids

Loss of nasolabial folds & drooping of the lower lip
Lesion

Facial nerve at stylomastoid foramen

Paralysis of upper and lower halves of facial muscles on the same side

Fig. 2.20: Infranuclear lesion of right facial nerve or Bell's palsy
<table>
<thead>
<tr>
<th>RAMSAY HUNT SYNDROME</th>
<th>GUILLAIN – BARRRE SYNDROME</th>
<th>MELKERSSON ROSENTHAL SYNDROME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Caused by <strong>involvement of geniculate ganglia by herpes zoster</strong>.</td>
<td>1. It is an <strong>auto-immune</strong> disorder in which immune system attacks healthy nerve cells in peripheral nervous system.</td>
<td>1. The cause is unknown but there may be <strong>genetic predisposition</strong>.</td>
</tr>
<tr>
<td>2. It shows in following symptoms: - Hyperacusis</td>
<td>2. Distal paresthesia and pain precede muscle weakness that <strong>ascends rapidly from lower to upper limbs</strong>.</td>
<td>2. It consists of <strong>recurrent facial paralysis</strong> and eventually permanent – <strong>facial edema</strong> and less constantly, plication of tongue.</td>
</tr>
<tr>
<td>Loss of lacrimation</td>
<td><strong>Bilateral facial</strong> and bulbar weakness occurs.</td>
<td></td>
</tr>
</tbody>
</table>
GUILLAIN BARRE SYNDROME

Figure 1: (a) Bell's palsy on left side at presentation. (b) Facial diplegia on 2nd day.
ROSENTHAL SYNDROME
<table>
<thead>
<tr>
<th>SARCOIDOSIS</th>
<th>LYME DISEASE</th>
<th>LEPROSY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It is an inflammatory disease characterized by presence of noncaseating granulomas. Its cause is unknown.</td>
<td>1. Caused by <strong>B. burgdorferi</strong>, a flagellated spirochaetal bacteria which infect humans after bites from ticks or lice.</td>
<td>1. Caused by <strong>Mycobacterium leprae</strong>. It is a chronic granulomatous disease affecting skin and nerves.</td>
</tr>
<tr>
<td>2. Neurologic disease is reported in 5-10% of sarcoidosis patients. Any part of the central and peripheral nervous system can be affected. Facial nerve paralysis can be transient and mistaken for Bell’s palsy.</td>
<td>2. It has 3 stages – a. Early localised disease b. Early disseminated disease c. Late disease. <strong>Unilateral or bilateral facial palsy occurs in 2nd stage</strong> of disease.</td>
<td>2. Peripheral nerve trunks are affected at ‘sites of predilection’. It affects facial nerve (zygomatic arch).</td>
</tr>
<tr>
<td>3. The presence of granulomatous inflammation is visible on MRI.</td>
<td></td>
<td>3. Tuberculoid leprosy has early and marked nerve damage than lepromatous leprosy.</td>
</tr>
</tbody>
</table>
MOEBIUS SYNDROME: It is bilateral facial paralysis resulting from the underdevelopment of 7th cranial nerve (facial nerve), which is present at birth. Its cause is unknown. The 6th cranial nerve is also affected, so people with Moebius Syndrome cannot form facial expression or move their eyes from side to side.
HOMOEOPATHIC THERAPEUTICS
<table>
<thead>
<tr>
<th>ACONITUM NAPELLUS</th>
<th>AGARICUS MUSCARIUS</th>
<th>BELLADONNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complaints and tension caused by exposure to dry, cold weather, draught of cold air, checked perspiration.</td>
<td>1. Patient is sensitive to pressure and cold air.</td>
<td>1. It stands for violence of attack and suddenness of onset.</td>
</tr>
<tr>
<td>2. Great fear, anxiety and worry. Fears death but believes that he will soon die; predicts the day.</td>
<td>2. Signs, talks but does not answer. Aversion to work. Fearlessness. Delirium begins with paroxysms of yawning.</td>
<td>2. Patient lives in the world of his own. Hallucinations; hideous faces. Desire to escape. Acuteness of all senses.</td>
</tr>
<tr>
<td>3. Red, hot, flushed and swollen face. On rising the face becomes deathly pale. Neuralgia of left side with tingling and numbness.</td>
<td>3. Facial muscles feel stiff; twitch; face itches and burns. Lancinating, tearing pain in cheeks as of splinters. Neuralgia as if cold needles ran through nerves and sharp ice touched them.</td>
<td>3. Red, bluish-red hot, swollen, shining, convulsive motion of muscles of face. Facial neuralgia with twitching of muscles flushed face and inability to speak. Exacerbation at 2PM or 3 PM and again at 11 PM.</td>
</tr>
<tr>
<td>CADMIUM SULPHURATUM</td>
<td>CAUSTICUM</td>
<td>COCCULUS</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>1.</strong> Symptoms appear after catching cold after failure of causticum.</td>
<td><strong>1.</strong> Chronic paralysis from dry, cold weather, especially during the intense cold of winter, of single parts or of single nerves. Gradually appearing palsies.</td>
<td><strong>1.</strong> Complaints caused by loss of sleep, night watching, mental excitement. Shows a special attraction to light haired women.</td>
</tr>
<tr>
<td><strong>2.</strong> Vertigo; room and bed seem to spin around. Hammering in head and heat.</td>
<td><strong>2.</strong> Mental ailments from long lasting grief, sudden emotions. Thinking of complaints aggravates.</td>
<td><strong>2.</strong> Mentally, there is slowness of comprehension. Time passes too quickly. Very anxious about the health of others.</td>
</tr>
<tr>
<td><strong>3.</strong> Painful drawing in face, inability to close eyes, distortion of mouth to one side, (mostly on left side) difficulty in talking and swallowing.</td>
<td><strong>3.</strong> Paralysis of right side of face. Pain in facial bones, jaws, with difficulty in opening mouth.</td>
<td><strong>3.</strong> Paralysis of facial nerve. Cramp like pain in masseter muscle; worse opening mouth.</td>
</tr>
<tr>
<td><strong>DULCAMARA</strong></td>
<td><strong>IGNATIA AMARA</strong></td>
<td><strong>MEZEREUM</strong></td>
</tr>
<tr>
<td>----------------</td>
<td>------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>1. Caused by exposure to cold, getting wet in rain, damp cold weather washing checked perspiration; when the days are hot and nights are cold.</td>
<td>1. It has marked hyperesthesia of all senses and a tendency to clonic spasms. Chief remedy for <strong>hysteria</strong>.</td>
<td>1. Patient is sensitive to cold air. Pains of various kinds with chilliness.</td>
</tr>
<tr>
<td>2. Mentally, patient is confused, rejects things asked for.</td>
<td>2. It is remedy of great contraindication, rapidly changing mental condition caused by ill effects of bad news, fright, anger, grief, disappointed love.</td>
<td>2. Mentally the patient is hypochondriacal, sad and despondent. Weak memory with absent mindedness and great aversion to talking.</td>
</tr>
<tr>
<td>3. <strong>Tearing in cheek extending to ear, orbit and jaw</strong> preceded by coldness of parts and attended by canine hunger. Facial neuralgia worse slightest exposure to cold.</td>
<td>3. <strong>Twitching of muscles of face and lips</strong>. Color changes when at rest.</td>
<td>3. <strong>Facial neuralgia after zona (eruptive disease)</strong>; toothache when the pains are aggravated by eating, leaves numbness running towards ear, at night better near hot stove.</td>
</tr>
<tr>
<td>PLATINA</td>
<td>VERBASCUM</td>
<td>ZINCUM PICRICUM</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1. It is primarily a women remedy having <strong>hysterical and sanguine</strong> temperament. Suited to women of dark hair, complexion and having rigid fibers.</td>
<td>1. Neuralgia affecting zygoma, temporo maxillary joint and ear, particularly <strong>left side</strong> with lacrimation, coryza and sensation as <strong>if parts were crushed with thongs</strong>. Talking, sneezing and change of temperature aggravates the condition. Pains come in flashes excited by <strong>least motion</strong>, occurring <strong>periodically at same hour in morning and afternoon each day</strong>.</td>
<td>1. Zincum has great affinity to nerves so it also has.</td>
</tr>
<tr>
<td>2. Mental disturbances after fright, grief, onanism and pride. Superiority complex is highest and alternate mental and physical symptoms.</td>
<td>2. Facial paralysis, <strong>brain fag</strong>. Redness and itching eruptions on chin. <strong>Tearing in the facial bones</strong>.</td>
<td>2. Facial paralysis, <strong>brain fag</strong>. Redness and itching eruptions on chin. <strong>Tearing in the facial bones</strong>.</td>
</tr>
<tr>
<td>3. <strong>Coldness, creeping and numbness in whole right side of face. Pain at the root of nose.</strong> Pains increase gradually and decrease gradually. <strong>Presenalgia</strong>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. <strong>Coldness, creeping and numbness in whole right side of face. Pain at the root of nose.</strong> Pains increase gradually and decrease gradually. <strong>Presenalgia</strong>.</td>
<td></td>
</tr>
</tbody>
</table>
2. Chaurasia B D - Human Anatomy (part 3)
3. Chugh Dr. S.N. - Textbook of Medicine
4. Davidson Sir Leybourne Stanley Patrick – Principles And Practice Of Medicine
5. Farrington E.A.- Comparative Materia Medica
6. Harrison- Principles of Internal Medicine
7. Lilianthal Samuel – Homeopathic Therapeutics
8. Sembulingam K and Prema – Essentials Of Medical Physiology
THANK YOU