

Lecture: 7 & 8

Cranial Nerves Diseases

Dr. Eyad M. Hussein

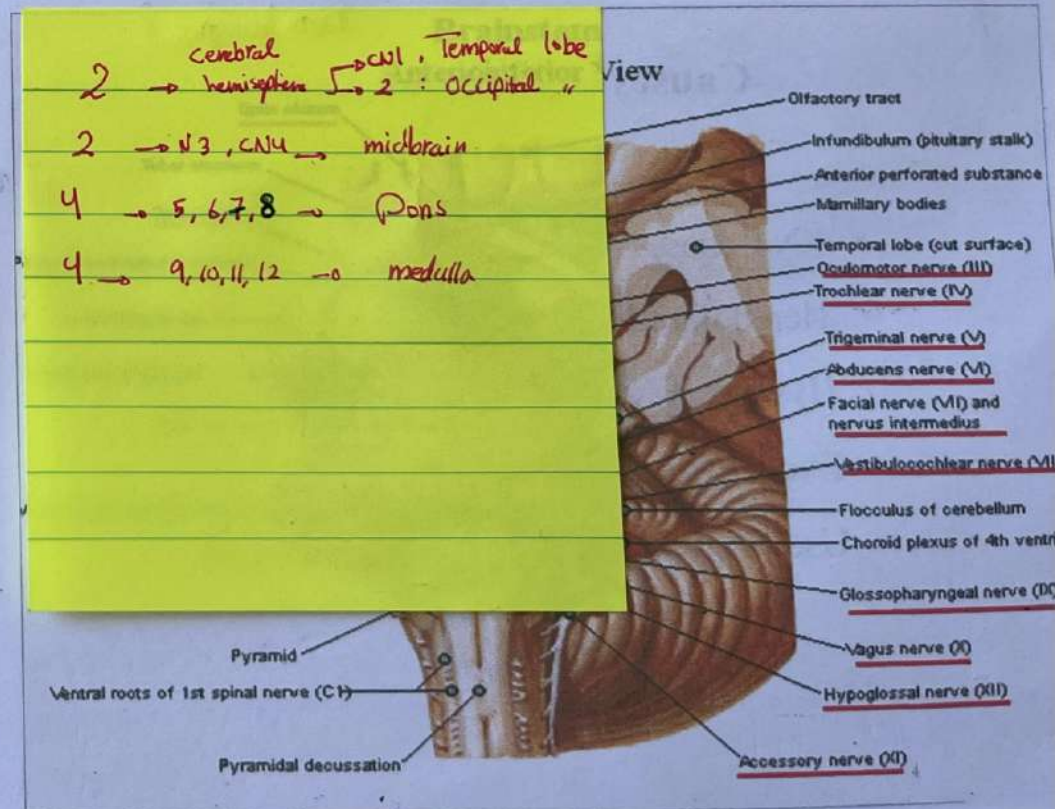
MD, Ph.D of Neurology
Consultant in Neurology Department,
Nasser Hospital,
Assistant Professor,
Faculty of Medicine, Islamic University
Faculty of Dentistry, University of Palestine

Classification of the Cranial Nerves

No	Name	Function	Site of nucleus	Opening in the skull
1	Olfactory	Smell	Temporal Lobe ✓	Cribriform plate
2	Optic	Vision	Occipital lobe ✓	Optic canal
3	Oculomotor	Motor	Midbrain	Superior orbital fissure ✓
4	Trochlear	Motor	Midbrain	Superior orbital fissure ✓
5	Trigeminal: Ophthalmic Maxillary Mandibular	Sensory ✓ Sensory ✓ Mixed ✓	Pons Pons Medulla oblongata Upper C. spinal cord	Superior orbital fissure ✓ Foramen rotundum Foramen ovale
6	Abducent	Motor	Pons	Superior orbital fissure
7	Facial	Mixed	Pons	Internal acoustic meatus, Facial canal, Stylomastoid foramen
8	Vestibulo-cochlear	Hearing and balance	Pons	Internal acoustic meatus
9	Glossopharyngeal	Mixed	Medulla oblongata	Jugular foramen
10	Vagus	Mixed	Medulla oblongata	Jugular foramen
11	Accessory	Motor	Medulla oblongata & C1-C4 AHC of spinal cord	Jugular foramen
12	Hypoglossal	Motor	Medulla oblongata	Hypoglossal canal

12 The Cranial Nerves

- The olfactory, optic and vestibulocochlear nerves are purely sensory nerves "special sensory" (128).
- The oculomotor, trochlear, abducent, accessory and hypoglossal nerves are purely motor nerves.
- The trigeminal, facial, glossopharyngeal and vagus nerves are mixed nerves (10975).



Lesion of the Smell "Olfactory" Pathway

1. (Unilateral) hyposmia or anosmia. فقدان الشم
2. Bilateral hyposmia or anosmia. انخفاض حاسة الشم في كلا النصفين
3. Parosmia (Smell hallucination) هلوسة شم
4. Cacosmia (bad smell in chronic sinusitis) رائحة كريهة
5. Olfactory agnosia عدم التعرف على الرائحة

* Olfactory tract located in ant. cranial fossa and attached to the inferior surface of frontal lobe.

Tract Olf. bulb ينمو Olf. groove ينمو Olfactory fiber
both hemispheres

Causes of Bilateral Anosmia

- ENT causes: common cold, atrophic rhinitis.
- Heredofamilial. وراثي
- Hysterical. نفسي
- Excessive smoking. المفرط في التدخين
- Use of cocaine. استخدام الكوكايين

Causes of Unilateral Anosmia

- Traumatic: skull base fracture
- Inflammatory: basal meningitis (unilateral and bilateral).
- Neoplastic:

meningioma - Olfactory groove meningioma → Foster Kennedy syndrome:

Olf. N. loss smell

(Foster Kennedy #)

1. Ipsilateral anosmia: due to pressure on olfactory pathway.
2. Ipsilateral blindness: primary optic nerve atrophy due to direct pressure on the optic nerve.
3. Contralateral papilloedema: due to increase intracranial tension.



Causes of Parosmia (Smell Hallucination) and Olfactory Agnosia

irritation Temporal lobe

- ✓ • Temporal epilepsy.
- ✓ • Temporal lobe SOL. space occupying lesion
- Intracranial aneurysm and AVM. arteriovenous malformation
- Psychogenic

Schizophrenia
الذهان
عند
الذهان
الذهان
الذهان

لنفهم نقل الاستثناء للعامل للعصبون
تلي يقول في نفسي ..

Optic Nerve Lesion

Causes of Visual Loss

- **Ocular causes:** diabetic retinopathy, retinal detachment, hypertensive retinopathy, glaucoma, macular degeneration, vitamin A deficiency, trauma.
- **Lesion of the visual neural pathway.**

Optic Nerve Lesion

Total optic nerve lesion leads to **ipsilateral** total blindness with loss of direct and indirect light reflexes

Examination: visual acuity and fundus examination

Fundoscopy:

- ✓ • **Papilloedema:** swelling of the papilla-optic disc
- ✓ • **Disc pallor** (optic nerve atrophy): in demyelinating disease (MS) and others

Causes of Optic Nerve Lesion

- 1. Demyelination:**
 - Multiple sclerosis- retrobulbar neuritis
 - Postinfectious and neuroretinitis
- 2. Ischemic and metabolic:**
 - Atherosclerosis
 - Giant cell arteritis *inflammation in superficial Temporal artery*
 - Diabetic
 - Syphilitic arteritis
- 3. Parainfectious:**
 - Cavernous sinus thrombosis
 - Sinusitis
- 4. Toxic and drugs:**
 - ✓ • Streptomycin
 - ✓ • Chloramphenicol
 - ✓ • Methanol
 - ✓ • Ethambutol → *بسر بوا الحول بفقده النظر ببطء*
- 5. Radiation**
- 6. Deficiency states:**
 - B vitamins deficiency
- 7. Heredofamilial:**
 - Dominant juvenile optic atrophy
- 8. Compressive:**
 - Meningioma
 - Metastasis to optic nerve or chiasm
 - Pituitary tumor
 - Glioma of optic nerve
 - Pseudotumor cerebri
 - Sarcoidosis
 - Lymphoma, Thyroid ophthalmopathy

Causes of Optic Disc Papilloedema

- 1. Intracranial hypertension:**
 - Brain SOL
 - SAH
 - Pseudo tumor cerebri
 - Hydrocephalus
 - Brain edema
 - Encephalitis
- 2. Optic nerve disease:**
 - Optic neuritis in MS
 - Giant cell arteritis
 - Toxic optic neuropathy
 - Hypervitaminosis A
- 3. Retinal vascular disease:**
 - Malignant hypertension
 - Vasculitis (SLE)
- 4. Venous occlusion:**
 - Cavernous sinus thrombosis
 - Central retinal vein thrombosis
- 5. Disc infiltration:**
 - Leukemia
 - Sarcoidosis
 - Optic nerve Glioma

Optic Neuritis

- The optic neuritis is an inflammatory, demyelinating condition that causes acute, usually monocular, visual loss.
- It is highly associated with multiple sclerosis (MS). Optic neuritis is the presenting feature of MS in 15 to 30% of patients.
- Eye pain كحالاتي عندما وجع العين
- Vision loss typically develops over a period of hours to days.
- The visual field defect in optic neuritis is typically characterized as a central scotoma
- Color blindness ✓ التباين بالعصب يسبب فقار بهي على جهة واحدة
✓ 30% of MS start with O-neuritis

MRI of Optic Neuritis



30 year old female presenting with right optic neuritis:

- A. T2-weighted coronal image shows hyperintensity in the right optic nerve.
- B. Post-gadolinium T1-weighted coronal image shows abnormal enhancement in the right optic nerve.
- C. Four years later, sagittal FLAIR shows multiple plaques outward from the corpus callosum and paraventricular suggestive of multiple sclerosis

Diagnosis of Optic Neuritis

- **Visual Field:** The visual field defect in optic neuritis is typically characterized as a central scotoma نقطه سوداء في البصر
- **Visual Evoked Response (Potential):** is the electrophysiologic manifestation of slowed conduction in the optic nerve as a result of axonal demyelination
- **Lumbar puncture** → نخز الـ CSF , AB , WBC
- **MRI** استثنت MS وبتأكد
بـ neuritis
cervical spine, orbit, brain MRI
to exclude demyelinating condition of CNS as MS.

Prognosis of Optic Neuritis

- **Recovery of vision:** improvement of vision begins after a few days and weeks. Improvement can continue over many months, 90% have better vision at one year.

إذا بدأ العلاج بالوقت المناسب ، السنة الأولى 90% يسيروا زب الفل

- **Recurrence:** there was a 35% recurrence of optic neuritis at 10 years:

- 14% in the ipsilateral eye. لهي 14% - يوجد ثاني
- 12% in the other eye. على نفس العين
- 9% in both eyes.

له من تكونه هاي حالة
MS ومارها
relapse

Treatment of Optic Neuritis

➤ **Intravenous methylprednisolone** (250 mg four times per day or 1000 mg once daily **for 3-5 days**) followed by **oral prednisone** (1 mg/kg per day) for **11 days** with a four-day taper

➤ **Beta Interferon** if presented multiple sclerosis

- inferior rectus m.
eye adduction & depression
- inf. oblique m.

Abducent Nerve

1. Diplopia on looking down and out.
2. Limitation of movement during examination for movement down and out.

Lesion of the Abducent Nerve

1. Diplopia on looking out wards.
2. Limitation during examination of eye movement in the outward direction.
3. Convergent paralytic squint.

الحول لجوا لانه
medial هي الى لسانه

Complete external ophthalmoplegia

Describes the immobile eye when the III, IV, and VI nerves are paralysed by:

1. **Orbital tumor or inflammation**
2. **Cavernous sinus thrombosis**
3. **Tolosa-Hunt syndrome**: is characterized by painful ophthalmoplegia (weakness of the eye muscles) and is caused by an idiopathic granulomatous inflammation of the cavernous sinus

* Ocular nerves = CN 3, 4, 6 = 3
كلام جركوا، الهمه
سكت الزعيم : 3

Lesion of the Oculomotor Nerve

- **Ptosis**: paresis of the levator palpebra superior muscle.
- **Diplopia**: occurs only on elevation of eye lid.
- **Squint**: divergent paralytic. **Medial rectus** لا يتثبت لقمه
- **Mydriasis**: dilated fixed pupil. **لبروا (حول)**
- **Loss of light and accommodation reflexes.**

توسع البؤبؤ لانه
dilatator pupillary muscle
تقتدى به
Constriction
صغيرة لها الضود الى عينه (فانه مت)

Causes of the oculomotor nerve lesion:

- Aneurysm of the posterior communicating artery
- Infarction of the third cranial nerve: HTN, DM
- **Weber syndrome**
- Midbrain tumor, infarction
- Cavernous sinus thrombosis

Causes of Miosis

Argyl-Robertson syndrome: partial ptosis "paralysis of the Müller" enophthalmus, anhydrosis.

in lesion (massive ischemic stroke, brain stem

lesion), cervical lesion (syringomyelia and cervical spinal cord tumor), neck pathology (Pancoast tumor, cervical rib resection surgery)

➤ **Argyl-Robertson pupil**: miosis, loss of light reflex with preserved accommodation

• **Causes**: neurosyphilis

➤ **Pin point pupils**: pontine hemorrhage, toxicity of morphine and organophosphorus compounds

➤ **Beta Interferon** if presented multiple scl

♥ (Oculomotor) :

→ motor function → eye ball حركة

هذا يعني عضلات العين من اخوته

→ parasymp. : Pupillary reaction
من خلية آفة يعني

Edinger - Westphal nucleus

هنا يعني ر. Para.

Ciliary muscle + pupillary
Constrict pupil (miosis) فنجير sphincter m.

toward direction.

Convergent paralytic squint.

Complete external ophthalmoplegia

Describes the immobile eye when the III, IV, and VI nerves are paralysed by:

1. Orbital tumor or inflammation
2. Cavernous sinus thrombosis
3. Tolosa-Hunt syndrome: is characterized by painful ophthalmoplegia (weakness of the eye muscles) and is caused by an idiopathic inflammation of the cavernous sinus

* يكون عنده عيب مسهل
وعيب فاقعة ، لو وقفنا حفت
المسلة بجر نوفر 2

Diplopia

→ Trochlear N. :

(superior oblique m.) ينفذ

, depression الى مسهل للعيب

abduction

abduens N :

(lat. rectus m.) ينفذ

مسهل abduction للعيب

→ ...
Beta Interferon if presented multiple scler

* Oculomotor N. : ليفي

- levator palpebrae superioris muscle

يرفع الجفنة العليا للعين

- medial rectus muscle

adduction

يقبل

- superior rectus m.

eye adduction و elevation

يقبل

toward direction.

Convergent paralytic squint.

Complete external ophthalmople

Describes the immobile eye when the III, IV, and VI nerves are

1. Orbital tumor or inflammation
2. Cavernous sinus thrombosis
3. Tolosa-Hunt syndrome

- inferior rectus m.

eye adduction & depression

- inf. oblique m.

abduction & elevation

- Ciliary m. / pupi-sphincter m.

Lesion of the Trochlear Nerve

1. Diplopia on looking down and out.
2. Limitation of movement during examination down and out.

Lesion of the Abducent Nerve

1. Diplopia on looking out wards.
2. Limitation during examination of eye movement toward direction.
3. Convergent paralytic squint.

عمله عليه للخارج

الحول إلى medial

with a four-day taper

cleriosis

الجفنة
توسع ليؤيد لانه Para. مزب
symp. سقديسه
dilator pupillary muscle
لو مطنيا الضود في عينه م
صير لها Constriction

Mydriasis: dilated fixed pu

Loss of light and accomm

Causes of the oculomotor

- Aneurysm of the poster
- Infarction of the third c
- **Weber syndrome**
- Midbrain tumor, infarct
- Cavernous sinus throm

erve

ination for

rve

ovement in

بقدريته

plegia

s are

plegia

inflammatory

* Causes of ocular m. weak //

1) lesion of CN 3, 4, 6 or nuclei
in brain stem (CVA, tumor, inf.)

2) Cavernous sinus disorder

DM,
MS

3) orbital lesion (mass, inf.)

4) injury of ocular m.

5) myopathy

6) M.G., Botulism

Causes of

drome: partial p

enophthalmus,

in lesion (massi

ical lesion (syrin

neck pathology (

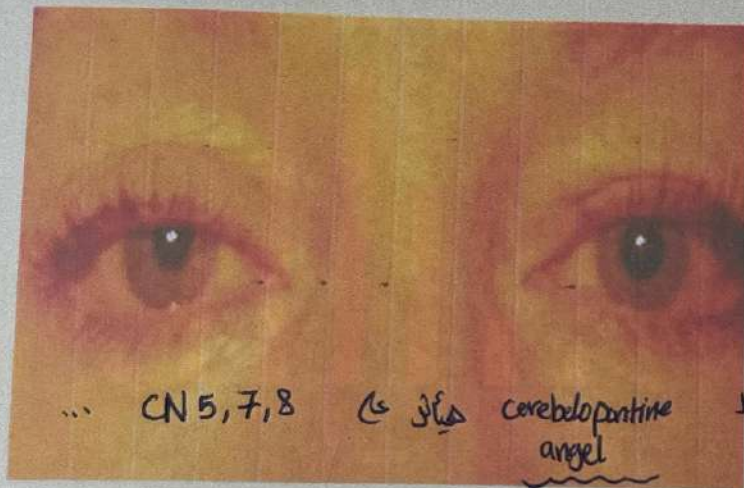
son pupil: mios

modation

rosyphilis

> **Pin point pupils:** pontine hem
and organophosphorus compoun

Horner's Syndrome



... CN 5, 7, 8 cerebellopontine angle Jt po *

The thickest cranial N. and arises by 2 roots:

✓ pain, touch, Temp, proprioception
 mixed nerve
 ← sensory is mainly →

✓ large sensory root
 ✓ small motor root
 for mastication muscles

Lesions of Trigeminal Nerve

1. Sensory affection:

- Trigeminal neuralgia.
- Loss of sensation over the face.

2. **Motor affection:** weakness of the mastication muscles and the jaw is deviated to side of lesion.

In bilateral lesion:

Causes of Mydriasis

➤ **Claude-Bernard Syndrome** (sympathetic irritation): lid retraction, mydriasis, exophthalmus, hyperhydrosis.

➤ **Oculomotor nerve palsy:** see oculomotor nerve

➤ **Myotonic pupil (Holmes-Adie pupil):** mydriasis, loss of light reflex, incomplete response to accommodation, may be associated with lost ankle jerk

Causes: hereditary, usually unilateral, in female and benign

Trigeminal Neuralgia (TN) "Tic Douloureux"



TN is defined as paroxysmal, stereotyped attacks of severe sharp pain (stabbing or electric-shock like pain) in the distribution of one or more branches of the trigeminal nerve.

- ✓ mandibular
- ✓ maxillary
- ✓ ophthalmic

Trigeminal Neuralgia - Epidemiology

- ❖ The annual incidence of TN is 4 to 8 per 100,000 people.
- ❖ Approximately 15,000 new cases occur in the US each year.
- ❖ Age: in 80-90% of patients, the disease begins after age 40 years. Peak incidence 60-70 years old.
- ❖ The male to female ratio of TN is about 2:3. <♀

Trigeminal Neuralgia - Classification

TN is divided according to the etiology into:

1. Primary

OR

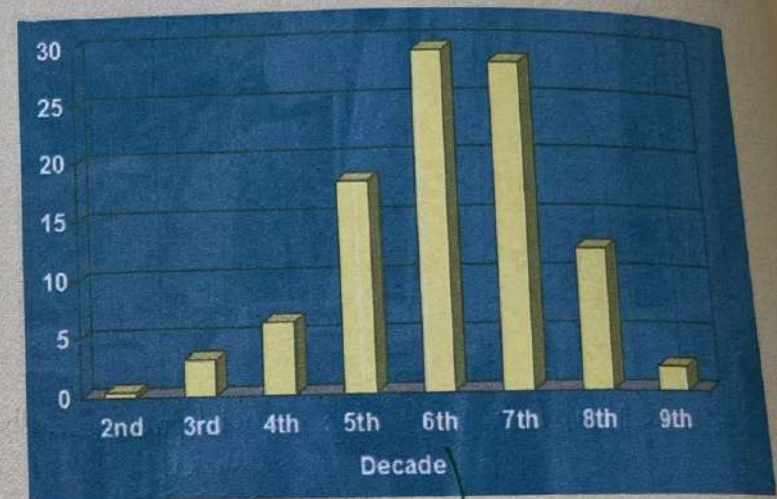
Classic or Idiopathic TG

2. Secondary

OR

Symptomatic TG

Age of Onset



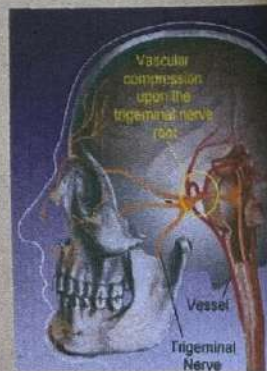
Peak : 60s

Etiology of TG

TN is divided into 2 categories:

1. Primary (Classic or Idiopathic): most cases of TN are **idiopathic** or caused by **vascular compression** of the trigeminal roots (most commonly by superior cerebellar artery or venous compression).

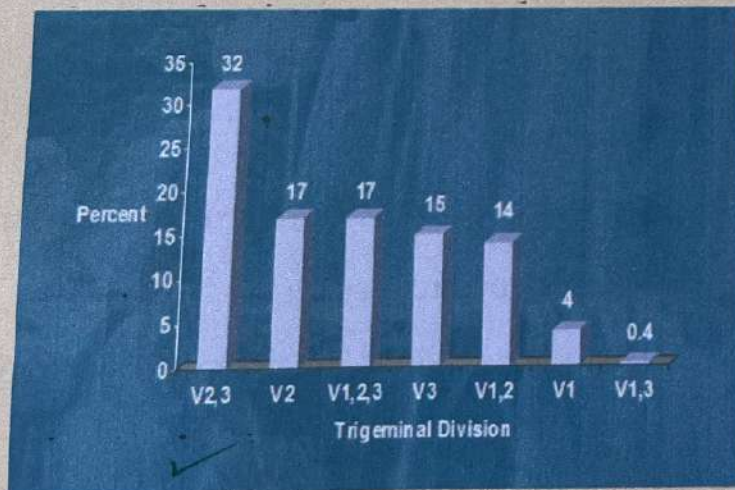
2. Secondary (Symptomatic): by structural lesion



Causes of Secondary TN

- ✓ ➤ **Brain stem lesion:** tumor, multiple sclerosis, infarction, syringobulbia.
- ✓ ➤ **Cerebellopontine angle lesion:** acoustic neuroma, meningioma, metastatic tumor.
- ✓ ➤ **Cavernous sinus lesion:** tumor (pituitary gland or others), thrombosis, and aneurysm of the internal carotid artery.
- ✓ ➤ **Trigeminal ganglion lesion:** herpes zoster with trigeminal post herpetic neuralgia. *مزمع ناري*
- ✓ ➤ **Peripheral branches of trigeminal nerve:** sinusitis, skull tumor, trigeminal neuralgia.

Distribution of Pain by Division



Distribution of Pain by Division

- Most often involves the maxillary (V₂) and/or mandibular (V₃) branches of the trigeminal nerve.
- The ophthalmic (V₁) branch is involved in less 5% of patients.
- The V₁ branch is most commonly affected by **postherpetic neuralgia**.

✓ Ophthalmic *عصب العين* بار Postherp. *بعد* 2nd *بار*
 V₂, V₃ *عصبوا* *العين* بار Primary

Diagnostic Criteria for Primary TN

"The International Headache Society (IHS)"

1. Paroxysmal attacks of pain which last a few seconds to less than two minutes, affecting one or more divisions of the trigeminal nerve.
2. Pain has at least one of the following characteristics:
 - a. Intense, sharp, superficial, or stabbing.
 - b. Precipitated from trigger areas or by trigger factors.
3. Attacks are stereotyped in the individual patient.
4. No neurologic deficit.
5. Pain not related to other disorder (focal lesion).

Distribution of Trigger Zones

بقاوت هاي لا امان
ما صندھا
لانھا عبقلا
irritation
وآرور عینہ الزلم



Trigger Factors for TN

استاء لمرور الزلم :

- Talking.
- Shaving.
- Smile.
- Applying make-up.
- Chewing.
- Drinking cold or hot fluids.
- Cold wind.
- Teeth brushing.

Red Flags for Diagnosis of TG

حنا هبیت می مسائل آفری عده می 2nd غیر TG

- ✓ ➤ Abnormal neurologic examination.
- ✓ ➤ Abnormal oral, dental, or ear exam.
- ✓ ➤ Age < 40 years.
- ✓ ➤ Dizziness or vertigo.
- ✓ ➤ Tinnitus or hearing loss.
- ✓ ➤ Facial numbness.
- ✓ ➤ Pain lasting > 2 minutes.
- ✓ ➤ Pain outside trigeminal distribution.
- ✓ ➤ Visual and ocular changes.



diplopia

Good News in Primary TN

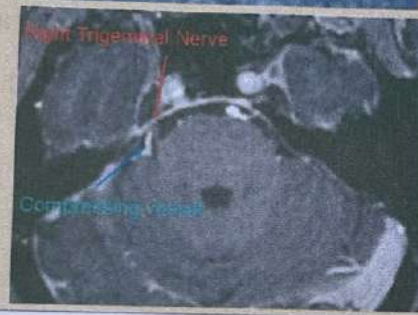
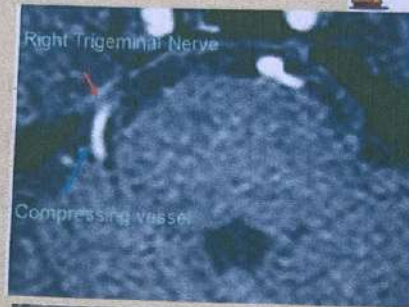
- ✓ 1. The pain, lasting seconds.
- ✓ 2. Always unilateral.
- ✓ 3. The pain disappear during night (bed time).
- ✓ 4. Spontaneous remission.
- ✓ 5. There are no signs of trigeminal nerve dysfunction.

لے لو فی بیتا لند 2 من primary

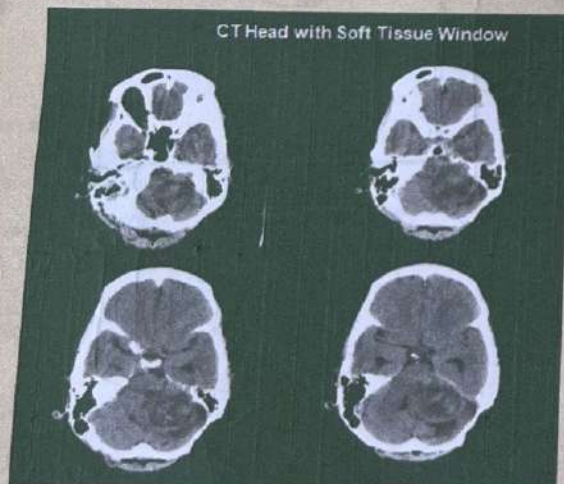
Imaging in Trigeminal Neuralgia



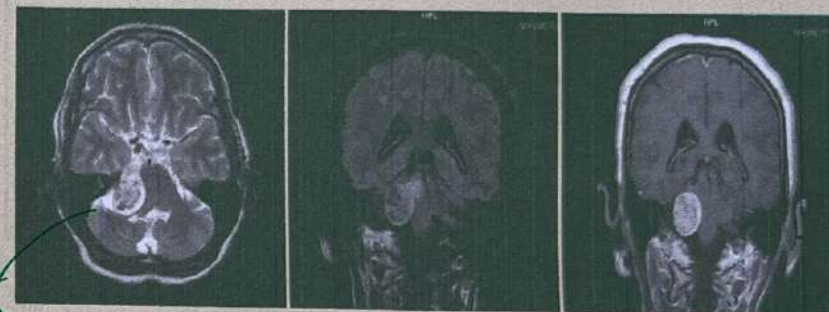
- ✓ 1. Brain Magneto- Resonance Imaging (MRI).
- ✓ 2. Brain Magneto- Resonance Angiography (MRA).
- ✓ 3. Brain Computed Tomography (CT).



Brain CT

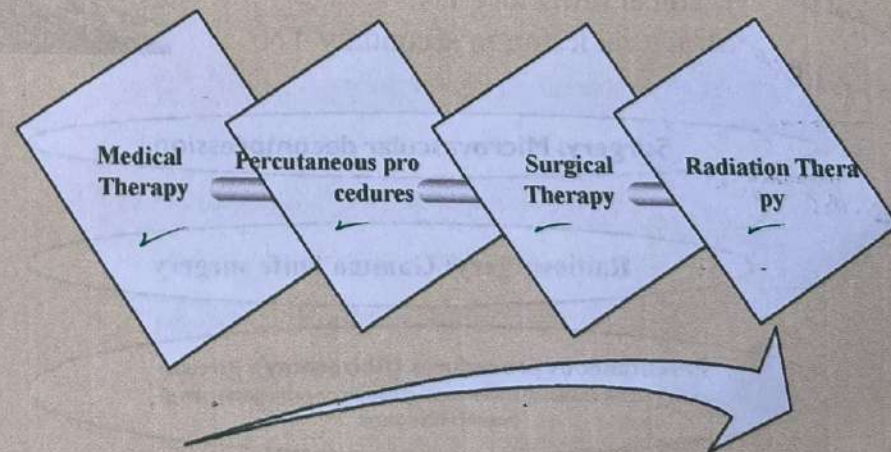


Brain MRI

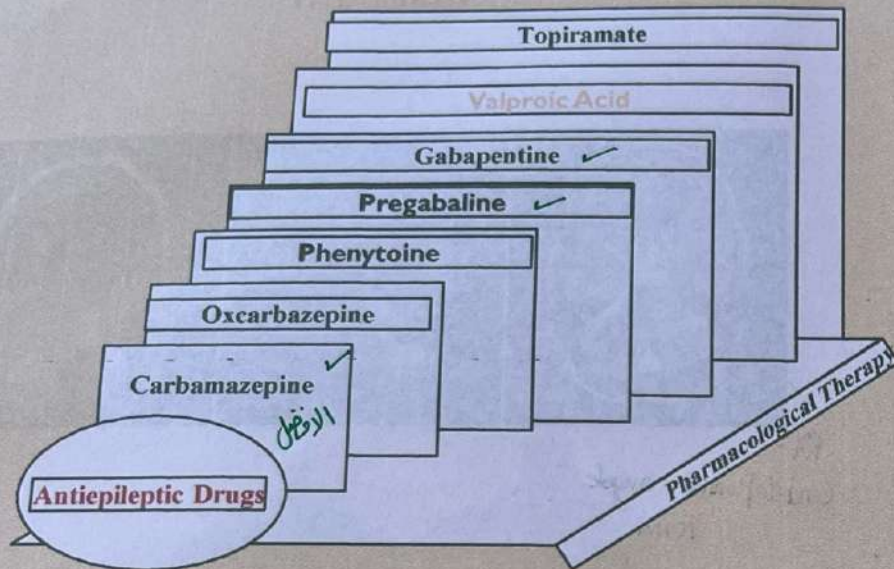


RT.
Cerebellopontine angle
tumor
لانه عندها نقطة لا يحس في الوجه
والفم الوجه

Treatment of TN



Medical Treatment of TN



❖ Carbamazepine is the best studied drug for TN and the only one with US Food and Drug Administration (FDA) approval for this indication.

❖ Other medications:

- **Antidepressant:** amitriptyline. → تنقل الألم
- **Muscle relaxant:** Baclofen.

Surgical and Radiosurgery Treatment of TN

Surgery is reserved for patients with:

- Medical refractory TN. ← من مسبقاً
- Structural lesion in secondary TN. ← عند فحص

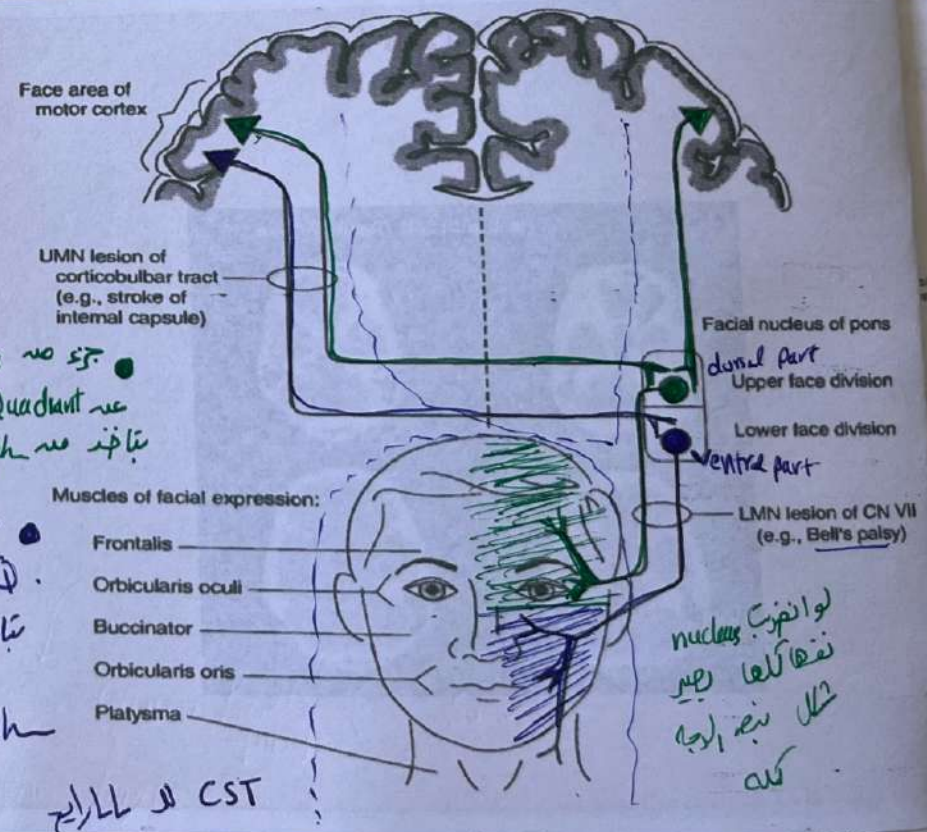


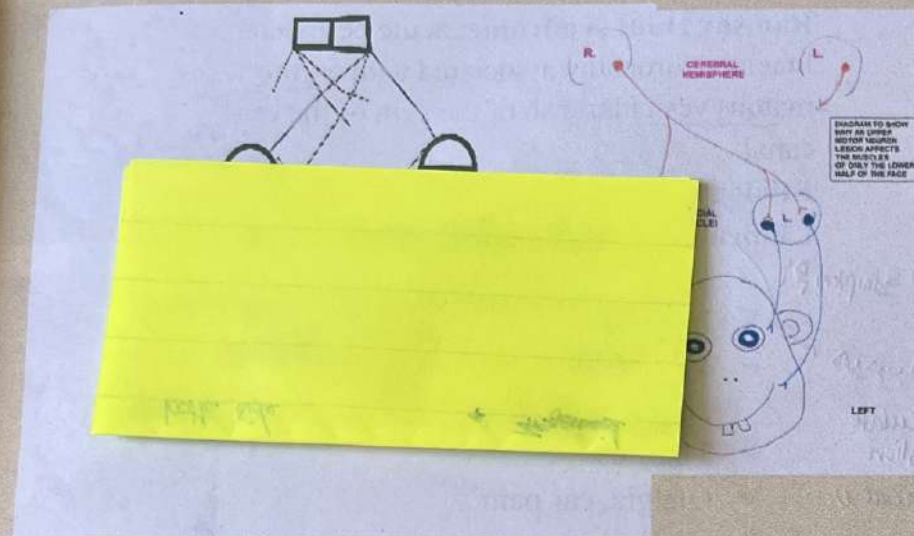
Surgery: Microvascular decompression

Radiosurgery: Gamma knife surgery

Percutaneous procedures (Rhizotomy): Percutaneous radiofrequency thermocoagulation or retrogasserian glycerol rhizotomy.

Peripheral neurectomy and nerve block





(Supranuclear lesion)

Lesions of the Facial Nerve

UMNL of the Facial Nerve	LMNL of the Facial Nerve
Affect <u>corticobulbar tract</u> above the facial nucleus	Affect <u>facial motor nucleus or the nerve itself</u> (nuclear or infranuclear lesion)
Paralysis of muscles of lower half of the face in opposite side of lesion lower quadrant of face opposite side	Paralysis of muscles of upper and lower half of the face in same side of lesion (Bell's palsy- Herpes simplex virus reactivation, Ramsay- Hunt Syndrome- Varicella - zoster reactivation) ipsilateral
Hemiplegia in the same side of facial paralysis	Hemiplegia in the <u>opposite</u> side of facial paralysis (pontine lesion) or without hemiplegia peripheral facial nerve lesion

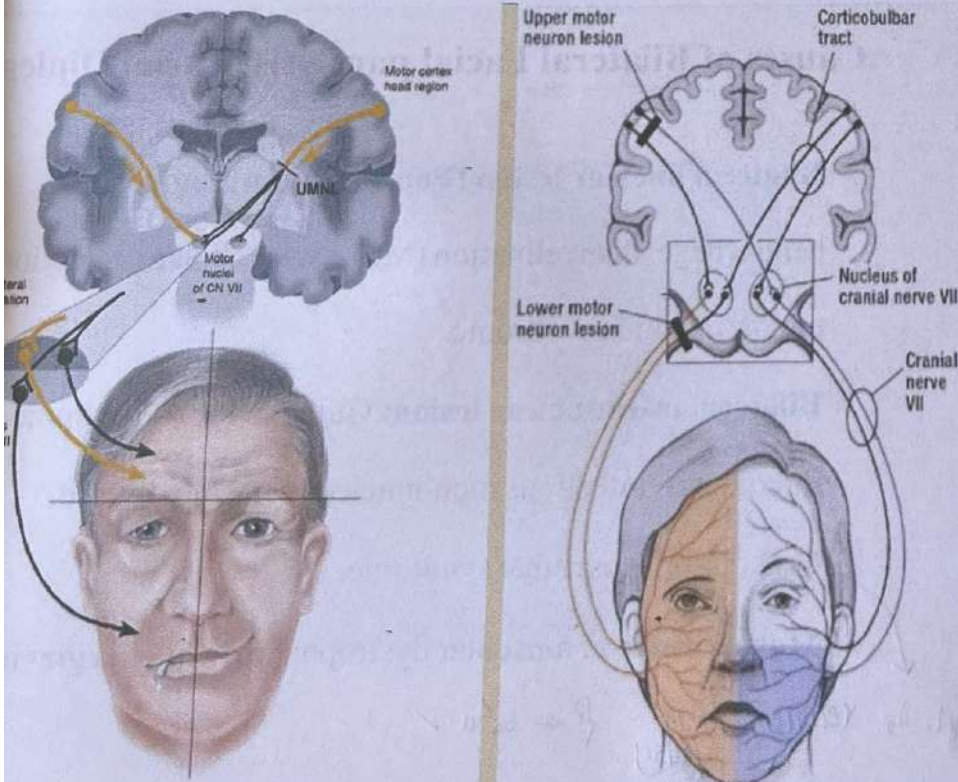
ipsilateral facial paralysis
 Contralateral hemiplegia
 brainstem lesion
 hemiplegia of nerve

Bell's Palsy

- ❖ Sir Charles Bell "Scottish Surgeon" first described the anatomy and function of the facial nerve in the 1800.
- ❖ **Bell's palsy:** defined as an acute peripheral facial nerve palsy of unknown cause.
- ❖ The annual incidence rate is between 13-34 cases per 100,000 population.
- ❖ **Etiology:** Herpes simplex virus reactivation.



November 1774 - 28 April 1842



ration (FDA)

تَعَالَى اللَّهُ

* Corticobulbar tract

↓
medial

CN 3, 4, 6

both side

↓
lateral

5, 7, 9, 10, 11, 12

* ~~Trigeminal~~

DIAGRAM TO SHOW WHY AN UPPER MOTOR NEURON LESION AFFECTS THE MUSCLES OF ONLY THE LOWER HALF OF THE FACE

OCULOCULAR MUSCLES

LEFT

Corticobulbar tract

UMNL

Clinical Features of Bell's Palsy

Patients with Bell's palsy typically present with sudden onset (usually over hours) of unilateral facial paralysis, common findings include:

- ✓ **Absent of forehead wrinkles** "more by looking upwards".
فقدان تجاعيد الجبهة
- ✓ **Inability to close the eye.**
عدم القدرة على إغلاق العين
- ✓ **Absent nasolabial fold.**
عدم وجود الخط القوسى
- ✓ **Drop (asymmetrical) of mouth angle.**
انخفاض الزاوية الفموية
- ✓ **Deviation the mouth to the non affected side.**
انحراف الفم إلى الجانب السليم

Causes of Peripheral Facial nerve lesion

- ✓ **Idiopathic:** Bell's palsy, Guillain-Barre syndrome, sarcoidosis.
- ✓ **Traumatic:** temporal bone fracture, penetrating middle ear injury, forceps delivery.
- ✓ **Endocrine:** DM, hypothyroidism.
- ✓ **Infection:** otitis media, mastoiditis, Ramsey-Hunt syndrome, HIV infection, parotitis, meningoencephalitis, mononucleosis, TB, Lyme disease.
- ✓ **Tumor:** facial nerve neuroma, acoustic schwannoma, parotid gland tumor, cholesteatoma, temporal bone tumor, cerebello-pontine angle lesion.
- ✓ **Congenital:** congenital facial palsy, Moebius syndrome.
- ✓ **Toxic:** carbon monoxide, lead intoxication.
- ✓ **Vascular:** HTN.
- ✓ **Pontine lesion:** infarction, hemorrhage, demyelination (MS), syringobulbia, infection, tumor, moebius syndrome.
- ✓ **Postsurgical:** mastoiditis, parotid gland, middle ear.

congenital absence of facial motor nucleus

Ramsay-Hunt Syndrome

Ramsay Hunt syndrome: acute peripheral facial neuropathy associated with erythematous vesicular rash of the skin of the ear canal.

Etiology: varicella-zoster reactivation

Clinical picture:

- Vesicular rash of the ear or mouth.
- Ipsilateral peripheral facial palsy.
- Vertigo and ipsilateral hearing loss.
- Tinnitus.
- Otagia: ear pain.
- Headaches.
- Fever.

symptoms of the disease

Geniculate ganglion

facial N.

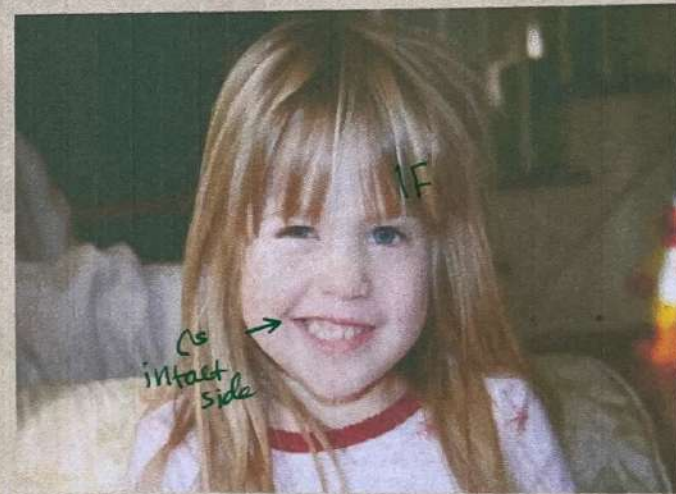


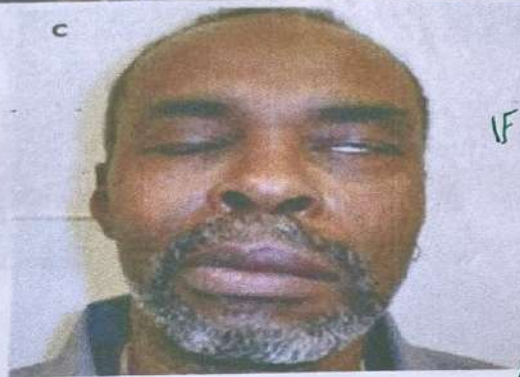
Causes of Bilateral Facial paralysis (Facial Diplegia)

- **Bilateral nuclear lesion (Pontine lesion):** infarction, hemorrhage, demyelination (MS), syringobulbia, infection, tumor, moebius syndrome.
- **Bilateral infranuclear lesion:** Guillain-Barre syndrome, sarcoidosis, infectious mononucleosis, Lyme disease, Melkersson-Rosenthal syndrome.
- **Muscle disease:** muscular dystrophy, myasthenia gravis.

recurrent facial palsy
graphical tongue

Bell's phenomenon





IF Bell Palsy

Lower Q. الـهتقيد Rt. ventral nucleus



lesion
lower
Quadrant

lesion

IF Corticocaudal tract



Ramsay

Treatment of Bell's Palsy

Eye Care:

- Artificial tears should be applied every hour while the patient is awake.
- Ophthalmic ointments should be used at night.

Protective glasses.

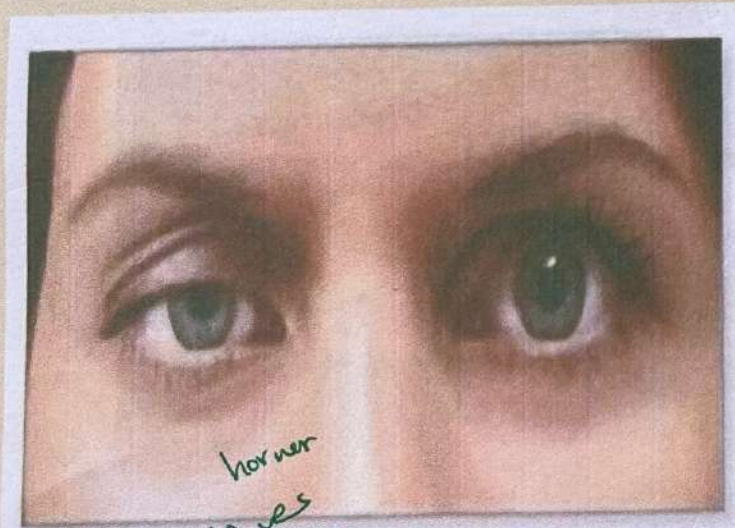
- Patches can be used at night.

➤ **Gucocorticoid therapy:** prednisolone (1 mg/kg daily for five days, then tapered by 10 mg daily, for a total treatment-10 days).

➤ **Antiviral therapy "for Ramsay- Hunt Syndrome":** acyclovir 400 mg 5 times daily for seven days.

Electrical facial nerve stimulation.

لـ الحركات نبدأ بعد اسبوع - 10 أيام



horner
ممكن فيه
بعض الحالات

دفع العين ما بقدر
ممكنه ته ظل عينه عليه
وسبب التهابات

Complication الـ دبر رطل Contraction الـ حركة لا ارادية بوضوح وده

with short duration, low frequency

Lesion of the Vestibulo-Cochlear Nerve

A. Lesion of the Cochlear Division:

1. Tinnitus in irritative lesion. *طنين*
2. Deafness in destructive lesion.

B. Lesion of the Vestibular Division:

1. Vertigo.
2. Spontaneous nystagmus.
3. Ipsilateral incoordination.

اضطراب السوائل بالقنوات
الداخلية ، *Triad*
✓ paroxysmal vertigo

✓ ~~tinnitus~~ tinnitus

✓ ↓ hearing

Causes of Deafness

1. **Conductive Deafness:** otitis media, cholesteatoma, tympanic membrane rupture, carcinoma.
2. **Sensorineural Deafness:** *مشكلة بالذنب*
 - **Congenital:** aplastic maternal rubella
 - **Infection:** mumps, labyrinthitis, meningitis
 - **Trauma:** petrous bone fracture
 - **Drugs:** streptomycin, gentomycin, salicylates
 - **Meniere's disease**
 - **Cerebellopontine angle tumor:** acoustic neuroma, meningioma *اي عروق فيها 5, 7, 8*
 - **Brain stem disease:** demyelinating disease, inflammation, syringobulbia, tumor, vascular accident

Functions of the Glossopharyngeal Nerve

1. Sensory function: supplies the:

- a. Posterior 1/3 rd of the tongue (taste and general sensation).
- b. Mucous membrane of the pharynx and tonsil.
- c. Carotid sinus and the carotid body.

2. Parasympathetic function: supplies the parotid gland.

3. Motor function: supplies one muscle only the

stylopharyngeus muscle

لو صارت فيه lesion : هيفقد حاسة التذوق + loss sensation in pharynx
Post 1/3 tongue + ipsilateral loss of pharyngeal reflex
partial + dysphagia
لأنه يفتح فمك و يمد
stylopharyngeus

Lesion of the Vagus Nerve

1. Palatal paralysis:

- a. Nasal tone of speech. *يحي زبي الأختف*
- b. Drop of palatal arch on paralyzed side and shift uvula to opposite side. *و لسان يرتفع راجع إلى الجانب السليم*
- c. Fluid regurge.
- d. Loss of palatal reflexes. *الحكة الصلبة من حيز فتح ال Palate*

2. Pharyngeal paralysis:

- a. Neurogenic Dysphagia. *صعوبة بلع للسائل < فماعة*
- b. Loss of pharyngeal reflex.

3. Laryngeal paralysis: hoarseness of the voice. *صعوبة بالصوت*

Others: tachycardia and constipation.

Lesion of the Spinal Accessory Nerve

- Ipsilateral paralysis of sternocleidomastoid muscle (rotation of the head and neck to the same side).
- Ipsilateral paralysis of trapezius muscle (inability to shoulder shrugging).

sterno- I.P. يتكئ راسه خلف الـ Rt ، فلو اكي انضربت Rt ، فار
I.P. ساعة " " " " يعين الـ الجهة السليمه



Tongue deviate to IF

- UMNL :
deviation tongue
to opposite side

- LMNL:
to same side

✓ nerve lesion
without hemiplegia

✓ medial medulla
⌘

Contralat.
hemiplegia

Lesion of the Hypoglossal Nerve

✓ **UMNL:**

- **Unilateral lesion:** deviation of the tongue to opposite side of lesion (corticospinal lesion): in cerebral stroke or tumor
- **Bilateral lesion:** inability to protrude tongue, in pseudobulbar syndrome

✓ **LMNL:** in bulbar syndrome, syringobulbia, medullary stroke

- **Unilateral lesion:** deviation of the tongue to same side of lesion (hypoglossal nucleus or nerve)
- **Bilateral lesion:** inability to protrude tongue
- In both LMNL presented muscle wasting and fasciculation

LMNL Bulbar Palsy (Syndrome)

- Progressive bulbar palsy is a progressive disturbance of the bulbar motor cranial nuclei, nerves or muscles.
- Food and fluid regurgitate due to paralysis of palate (X-nerve)
- Dysphagia
- Dysphonia, Dysarthria
- Unilateral lesion: deviation of the tongue to same side of lesion (hypoglossal nucleus or nerve)
- Bilateral lesion: immobile, and inability to protrude of tongue
- Tongue muscle fasciculations and atrophy
- Decrease or loss of jaw, palatal and gag reflexes

بفد
رطع
سنة

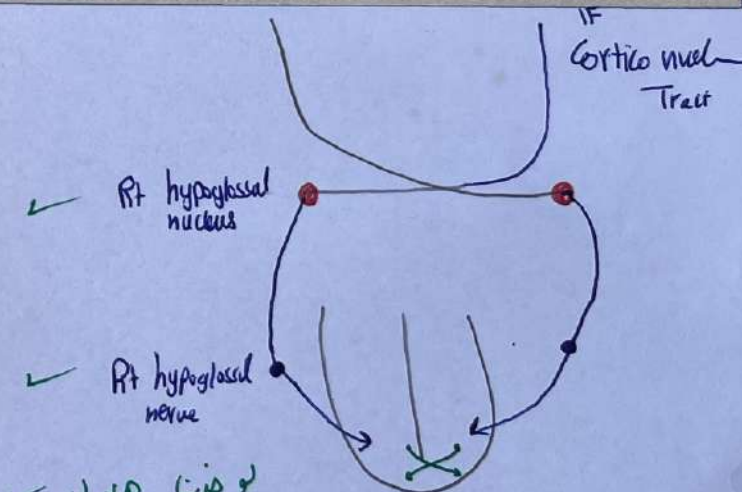
Pseudobulbar Palsy (Syndrome)

- Features are due to degeneration of ^{both} corticobulbar fibers to IX, X, XI and XII nerve motor nuclei (bilateral supranuclear lesion)
- Food and fluid regurge due to paralysis of palat (X-nerve)
- Dysphagia
- Dysphonia, Dysarthria
- Tongue is immobile, and cannot protrude (XII-nerve)
- Emotional liability في بعض الأحيان
- Exaggeration of jaw and gag reflexes

Thank You

Causes of Lower Cranial Nerve Palsies

- **Skull Base/Intracranial:** basal skull tumor (meningioma, neurofibroma, metastasis, carcinoma), bone lesions (osteomyelitis), basal meningitis (especially TB)
- **Brain Stem:** infarction, tumor, syringobulbia, MND, poliomyelitis, demyelination
- **Neck:** penetrating injury, neck operations, tumors
- **Systemic Causes:** DM, sarcoidosis, SLE
- **Polyneuropathy:** Guillain-Barre syndrome, postinfectious
- **Muscle:** muscular dystrophy.
- **Neuromuscular junction:** bulbar type of myasthenia gravis, botulism



لو هزينا صاويل ✓ اللسان هيقول
لا R+ يعني تا البرة الصابة

لكم لو هزينا UMN هيوح البرة الثانية. Contralat.