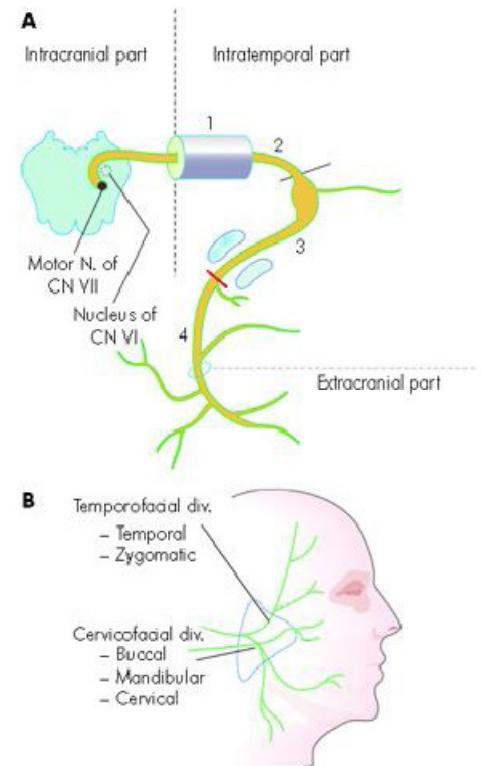


# FACIAL NERVE

## • COURSE:

~ Motor fiber originate from VII nerve nucleus, joined to sensory root > leaves B. stem at pontomedullary junction > internal acoustic meatus > facial canal > transverse the temporal bone > comes out from stylomastoid foramen > divided into:-

1. Intracranial: nucleus > internal acoustic meatus.
2. Intratemporal (cranial): from IAM to stylomastoid foramen (fallopian canal).
3. Extracranial: From stylomastoid foramen > Turn around styloid process > Then enter parotid "here it divides it into anterior & posterior gland" > Then it gives terminal branches dividing the parotid into superficial and deep parts:
  1. Temporal
  2. Zygomatic
  3. Buccal
  4. Mandibular
  5. Cervical



**Fig. 14.2** (A) Course of facial nerve. Intratemporal part consists of four segments: Meatal (1), Labyrinthine (2), Tympanic (3), Mastoid (4). (B) Branches of facial nerve on face.

## • NUCLEUS:

- ~ In pons, receives fibers from precentral gyrus.
- ~ The upper half of it receive innervation from both sides of cortex , While the lower half of it receive innervation from one side only. So, upper motor neuron lesion will affect only lower half of the face on the contralateral side. While in LMNL the whole side will be affected on the same side.
- ~ Emotional movements are controlled by thalamus.
- ~ + Involuntary control of facial muscles.
- ~ Nucleus tractus solitarius > taste.

## • INNERVATION:

1. Motor: stapedius and facial muscles.
2. Secretemotor: submandibular, sublingual (chorda tympani) and lacrimal glands (greater superficial petrosal nerve).
3. Taste: anterior 2/3 of tongue (chorda tympani).
4. Sensory: external auditory meatus.

## • DAMAGE TO NERVE:

SupraNeuclear Lesion	InfraNeuclear lesion
– Forhead intact bilaterally	– Total facial palsy
– Emotion intact	– Emotion impaired
– Deficient of tong ,lip	– No deficit

### ○ Nerve Regeneration :

- ~ I.e. changes which occurs to distal n. trunk after injury
- ~ Following severing of the axon the Schwann cells become phagocytic, with macrophages, they remove the axons & myelin debris. The Schwann cells then multiply to fill in the gap. At the proximal end of axon growth cone appear forming regeneration axons which forming many mall axons. This result in an axon previously supply single muscle now supplies widely separated muscles (syakinesis).
- ~ Rate of nerve regeneration is 1 mm/day.

### ○ Nerve Injuries can be divide Into:

1. Partial block to flow of axoplasm(neuropraxia) (conduction block) (compression), recovery of function is complete
  2. Loss of axons (axonotomesis), but endothelial tube remains intact. During recovery, neuron will grow into their respective tubes, and the result is good.
  3. Injury to endothelium (neurotomesis) (degeneration) , during recovery, axons will grow into another. Synkinesis can occur
- ~ both present with paralysis so how can we differentiate between them?

## • ELECTRO DIAGNOSTIC TEST:

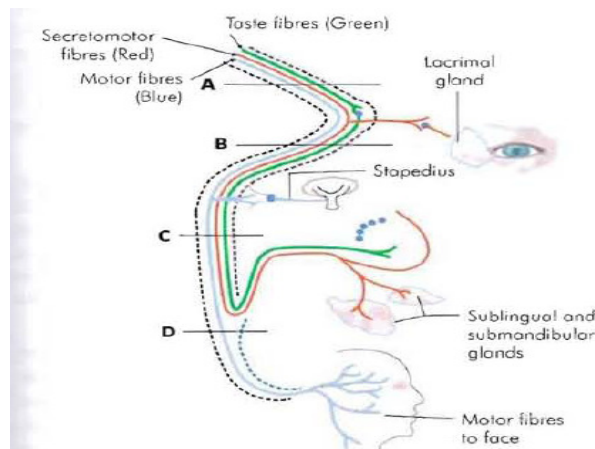
1. NET (nerve excitability test).
2. ENoG(Electroneuronography): The problem of these two is that if you have a degenerative lesion it will still give response up to 3 days.
3. EMG: mainly used in chronic cases.

## • CLINICAL FEATURES:

1. Loss of facial muscle
  2. Phonophobia > stapedius
  3. Dryness of the eye > lacrimal
  4. Loss of taste
  5. Rarely lacrimation > I forgot why
- ~ Of course you will not find all of these but it depend on site of lesion.

## • TOPODIGNOSTIC TESTS:

- ~ Are useful in finding the site of lesion in paralysis of lower motor neuron.



**Fig. 14.9** Topographical localisation of VIIth nerve lesions. (A) Suprageniculate or transgeniculate lesion. Secretomotor fibres to the lacrimal gland leave at the geniculate ganglion and are interrupted in lesions situated at/or proximal to geniculate ganglion. (B) Suprastapedial lesions cause loss of stapedial reflex and taste but preserve lacrimation. (C) Infrastapedial lesions cause loss of taste but preserve stapedial reflex and lacrimation. (D) Infrachordal lesions cause loss of facial motor function only.

### 1. Schirmer's test ( test the lacrimation) :

- ~ It compares lacrimation of the two sides. A strip of filter paper is hooked in the lower fornix of each eye and the amount of wetting of strip measured. Decreased lacrimation indicates lesion proximal to the geniculate ganglion (The secretomotor fibres leave the geniculate ganglion) via greater superficial petrosal nerve.

### 2. Taste sensation:

- ~ Impairment of taste indicates lesion above the chorda tympani.

### 3. Salivary flow test:

- ~ Decreased salivation shows injury above the chorda.

### 4. Stapedius reflex test:

- ~ Stapedial reflex is lost in lesions above the nerve to stapedius.
- ~ It is tested by tympanometry.
- ~ very practical.

## ● CAUSES OF FACIAL PARALYSIS:

#### 1. Central

- a) Brain abscess
- b) Pontine gliomas
- c) Poliomyelitis
- d) Multiple sclerosis

#### 2. Intracranial port (cerebellopontine angle)

- a) Acoustic neuroma
- b) Meningioma
- c) Congenital cholesteatoma
- d) Metastatic carcinoma
- e) Meningitis

#### 3. Intratemporal port

- a) Idiopathic
  - 1- Bell's palsy
  - 2- Melkersson's syndrome
- b) Infections
  - 1- Acute suppurative otitis media
  - 2- Chronic suppurative otitis media
  - 3- Herpes zoster oticus
  - 4- Malignant otitis externa
- c) Trauma
  - 1- Surgical: Mastoidectomy, Stapedectomy
  - 2- Accidental: Fractures of temporal bone
- d) Neoplasms
  - 1- Malignancies of external and middle ear
  - 2- Glomusjugulare tumour

3- Facial nerve neuroma

4- Metastasis to temporal bone (from cancer of breast, bronchus, prostate)

#### 4. Extracranial port

- a) Malignancy of parotid
- b) Surgery of parotid
- c) Accidental injury in parotid region
- d) Neonatal facial injury (obstetrical forceps)

#### 5. Systemic diseases

- a) Diabetes mellitus
- b) Hypothyroidism
- c) Uraemia
- d) Polyarteritis nodosa
- e) Wegener's granulomatosis
- f) Sarcoidosis (Heerfordt's syndrome)
- g) Leprosy
- h) Leukaemia
- i) Demyelinating disease

## ❖ BELL'S PALSY:

- ~ Acute, idiopathic peripheral facial paralysis.
- ~ Most common cause of facial paralysis
- ~ Male = female
- ~ Risks increase in DM & pregnancy

### • AETIOLOGY:

- 1. Viral "HSV, EBV"
- 2. Vascular ischemia
  - a) 1ry :cold & emotional stress
  - b) 2ry :edema
- 3. Hereditary
  - ~ Narrowing of fallopian canal
  - ~ 6-8 % of pt. has positive family history.
- 4. Autoimmune

### • CLINICAL FEATURES:

- 1. Inability to close lid.
- 2. Asymmetry of the face.
- 3. Epiphora "excessive tears".
- 4. Noise intolerance (stapedial paralysis).
- 5. Loss of taste.

### • DX:-

- ~ By exclusion of other causes.
- ~ Hx, examination, investigations "lab + radiological"

- ~ Nerve conductive study.
- **RX:-**
  - ~ Steroid (controversial):- may reduce degeneration, synkinesis. May hasten recovery.
  - ~ Surgical decompression of labyrinthine, segmental may be helpful;
  - ~ Antiviral agents: poor result.
- **PROGNOSIS:**
  - ~ Excellent in most of the patient.
  - ~ 80% to 90% will recover completely.
  - ~ The most prognostic factor is whether the paralysis is there not.

## ❖ RAMSI HUNT'S SYNDROME:

- ~ due to herpes zoster infection of the geniculate ganglion.
  - Facial paralysis + facial rash
  - may have vertigo & hearing loss
  - usually elderly
  - May involve V, VI & XII CN. And rarely IX & X.
  - Recovery less likely than Bell's.
- **RX:**
  - ~ Steroid and antiviral.

## ❖ OM

- ~ Rare.
- ~ Can occur in acute or chronic otitis media or cholesteatoma.
- ~ O.M. account for only 3.1% of acute facial paralysis.
- ~ Facial canal dehiscence is common finding.
- **RX:**
  - ~ AOM :
    - I.V. antibiotics & myringotomy for drainage.
    - Corticosteroid maybe helpful.
  - ~ COM :
    - High probability of Cholesteatoma and require surgical decompression.

## ❖ TRAUMA:

### • TEMPORAL BONE FRACTURE

#### ① Longitudinal

- Most common
- cause conductive hearing loss
- less intense
- Best prognosis
- Facial paralysis affect 20%
- delayed & incomplete facial paralysis

#### ② Transverse

- less common
- Pts may loss vestibular function.
- require more intense blow to fracture skull
- worse prognosis
- Facial paralysis affect 50% of cases
- immediate & complete

#### • RX:

- ~ If nerve violation is evident:
  - Immediate complete paralysis
  - Electronervogarphy (ENG)
- ~ Surgical exploration: - Repair of facial nerve.

### • SURGICAL TRAUMA OF FACIAL NERVE

- ~ If evident intraoperatively... Repair of facial n. is a must
- ~ If evident postoperatively :-
  - If immediate & complete ► re-explore
  - If delayed & incomplete ► wait & observe.

This is all what I can remember from the lecture .....

Good luck edited by PHD

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