

CRANIAL NERVE VII



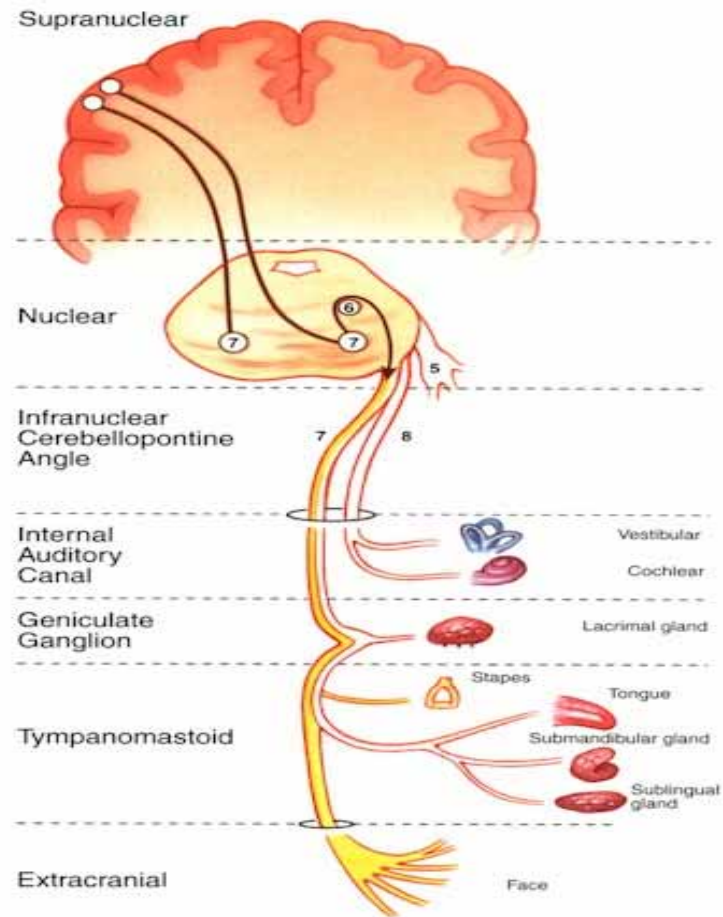
THE FACIAL NERVE

ANATOMY

Long complicated course:

- Cerebral cortex
- Internal capsule
- Brainstem : nucleus in the lower Pons
- Leaves brainstem at cerebello-pontine angle
- Internal auditory meatus – Canal
 - CN VII
 - CN VIII
 - Nervus intermedius
 - Internal auditory artery and vein

ANATOMY (cont)



ANATOMY (cont)

Temporal bone

- Labyrinthine segment

- Horizontal segment

 - Medial wall of middle ear

- Vertical segment

 - mastoid

Exits at stylomastoid foramen

ANATOMY (cont)

- ✦ Turns to run through parotid gland
 - Divides into branches

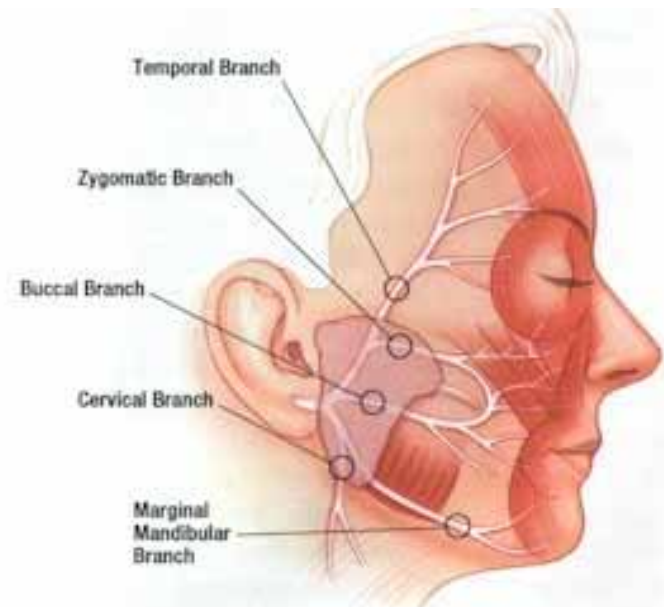


Figure 2b: Branching patterns of the facial nerve in the upper and lower face.

ANATOMY (cont)



- # Motor supply to face and a few sensory fibres to ear
- # Secretomotor component - parasympathetic

ANATOMY (cont)

- ⚙️ Fibres from contralateral hemisphere supply the nucleus in pons
- ⚙️ Motor fibres from ipsilateral hemisphere supplies the portion of nucleus that innervates the forehead
 - UMN innervation of forehead - bilateral

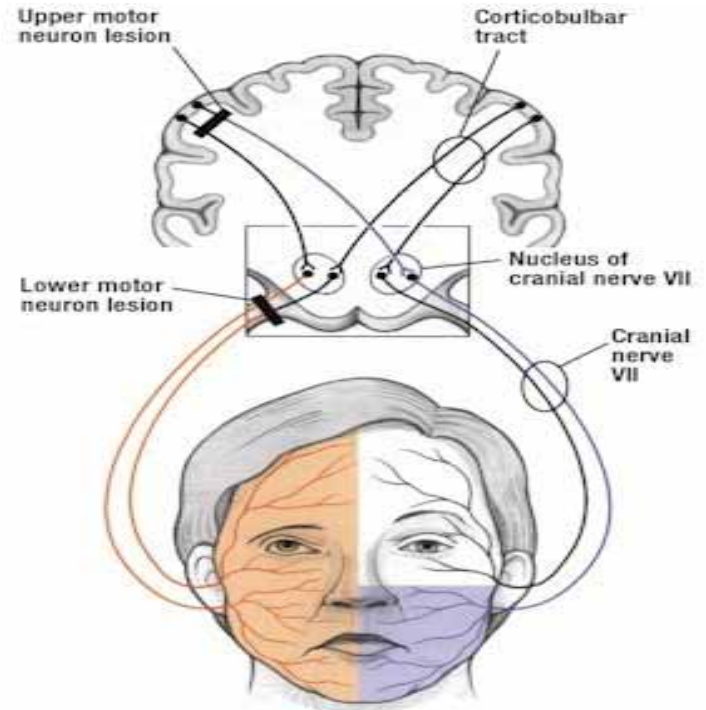


Figure 2a: The color lines show the distribution of facial muscles paralyzed after a supernuclear lesion of the corticobulbar tract and after a lower motor neuron lesion of the facial nerve.

GENERAL

- # Damage = facial weakness + cosmetic deformity
- # Level of damage is determined by clinical picture
 - UMN vs LMN
- # Degree of recovery dependent on extent of damage

AETIOLOGY

- # UMN lesions = neurosurgeon/
neurologist
- # LMN lesion = ENT surgeon
 - damage along pathway of nerve

CAUSES: NON TRAUMATIC

- # Bell's palsy - most common
- # Herpes Zoster oticus
- # Tumors
 - Acoustic neuroma
 - Parotid tumors
- # Ramsey Hunt Syndrome

CAUSES: NON TRAUMATIC

Infections

- TB

- Mastoiditis

- Viral infections

CSOM

AOM

CAUSES: CONGENITAL



TRAUMATIC

- Difficult delivery
- Forceps
- Large infant

CAUSES: CONGENITAL

INHERITED

- Myotonic Dystrophy
 - Autosomal dominant
 - Muscle wasting + mental impairment
 - CNVI I palsy = early sign
- Albers-Schoenberg disease
 - Autosomal recessive
 - Affects bone metabolism
 - Osteoperosis of bony canals

CAUSES: CONGENITAL

DEVELOPMENTAL

- Moebius syndrome
- Charge syndrome
- Oculo-auriculo-vertebral syndrome
- Congenital unilateral lower lip palsy

CAUSES: ACQUIRED

INFECTIONS

- Ramsey Hunt Syndrome
- Herpes Zoster oticus
- OME
- TB
- Mastoiditis
- Syphillis
- AIDS

CAUSES: ACQUIRED

NEOPLASTIC

- Schwannomas
- Acoustic neuroma
 - CNVIII
- Parotid gland tumors

CAUSES: ACQUIRED

METABOLIC

- DM
- HT
- Pregnancy
- Autoimmune diseases
- hypothyroidism

CAUSES: ACQUIRED



NEURO

- GBS


- MS

CAUSES: ACQUIRED

TRAUMATIC

- Skull base #'s
- Iatrogenic
 - Surgical injuries
- Sharp injuries

APPROACH:



TRAUMATIC AND NON-
TRAUMATIC LMN
FACIAL NERVE PALSY

TRAUMATIC:

Post surgical

- Requires urgent attention
- ? urgent surgery

Laceration to extra-temporal course

■ Assess:

- Branches involved, how distal lesion is and degree of damage (paralysis, paresis and palsy)
- Urgent referral to ENT/ plastic surgeon

TRAUMATIC (cont):

✦ Petrous temporal bone #'s:

■ Characteristics:

- Hx of significant head trauma
- Haemotympanum / laceration of EAM

■ #'s:

■ Longitudinal (90%)

- ✦ Side blow; 20% facial nerve injury

■ Transverse (10%)

- ✦ Frontal/occipital blow; 40% facial nerve injury
- ✦ May be bilateral, ass. with hearing loss

TRAUMATIC (cont):

Petrous temporal bone #'s...

■ Mechanism of damage:

- Bony spicule
- Intraneural haematoma
- Neural contusion
- Nerve transection

■ Possible complications:

- Facial nerve palsy
- Deafness (sensorineural/conductive)
- Vertigo
- CSF leakage (otorrhoea)

TRAUMATIC (cont):

Petrous temporal bone #'s:

■ Management: thorough neuro assessment

■ Immediate and complete palsy: refer to ENT

■ CSF leakage: neurosurgical opinion

■ Sensorineural deafness and vertigo (inner ear)

Bedrest, labyrinthine sedatives and early mobilisation

■ Guidelines for elective ENT referral:

Conductive deafness $>1/12$

Partial or delayed facial nerve palsy

Any signs of inner ear damage

NON-TRAUMATIC:

- # Mostly idiopathic (Bell's)
- # 90% resolve spontaneously
- # Usually no significant sequelae

NON-TRAUMATIC (cont):

EXCLUSION CRITERIA FOR BELL'S:

- Signs of a tumour
- Bilateral simultaneous palsy
- Vesicles
- Involvement of multiple motor CN's
- Hx or evidence of trauma
- Ear infection
- Signs of CNS lesion
- Facial palsy noted at birth
- Triad of IM (fever, sore throat, cervical LA)

BELL'S PALSY:

- # Unilateral facial palsy
- # Acute onset
- # Other sx: pain, hearing loss
- # 85% begin to recover in 3 weeks
 - Usually recover fully
- # 15% recover after 3/12
 - Poor clinical result

BELL'S PALSY (cont):

Management:

- Prednisone 1mg/kg/day for 10 days
- Must start within 14 days of onset
- Acyclovir 400mg QID for 10 days
- Corneal protection:
 - Ointments
 - Eye drops
 - Eye coverage

HERPES ZOSTER OTICUS:

- # Ramsay-Hunt syndrome
- # Varicella zoster virus
- # Poor prognosis
- # Presents with severe otalgia
- # Vesicles appear in 3-7 days
- # Rx: steroids and acyclovir

ACUTE OTITIS MEDIA:

- # Palsy occurs in 2-3 days
- # Rx: myringotomy and I V antibiotics
- # If acute mastoiditis: do mastoidectomy
- # Do not decompress nerve

CHRONIC OTITIS MEDIA:

- # Acute infectious exacerbations of CSOM
 - I V I antibiotics and surgery
- # Cholesteatoma
 - surgery

SPECIAL INVESTIGATIONS:



RADIOLOGICAL TESTS:



- # Not indicated for every pt
- # High resolution CT
- # MRI

ELECTROPHYSIOLOGIC TESTS:

- # Electroneuronography (EnoG):
 - 2 weeks of onset of sx
 - Measures and compares amplitudes of muscle summation potentials
 - Current applied over main trunk of facial nerve
 - Determines % degeneration

ELECTROPHYSIOLOGIC TESTS

(cont):

- # Nerve excitability test (NET):
 - Wave pulse applied to affected and unaffected facial nerve
 - Thresholds for min facial responses recorded and compared
 - 3-4mA difference abN

ELECTROPHYSIOLOGIC TESTS

(cont):

- # Maximal stimulation test (MST):
 - Stimulates ipsi- and contralateral facial muscles
 - Use max stimulation to evaluate muscular response
 - Subjective observation
- # Electromyography (EMG):
 - Determines muscle activity rather than nerve

ELECTROPHYSIOLOGIC TESTS

(cont):

Audiometry:

- Evaluates conductive and SN hearing loss
- Co-existent in pt with CN VII palsies

Branches:

- Greater Superficial Petrosal Nerve:
 - Schirmer's test: assess parasymp innervation to lacrimal gland
- Nerve to Stapedius: stapedius reflex (audiometry)
- Chorda tympani nerve: test for taste

CLASSIFICATION:



HOUSE-BRACKMANN SCALE:

- # I : N movement
- # II : slight weakness, N symm and tone
- # III : obvious weakness, no disfiguring weakness, N symm and tone, complete eye closure
- # IV : obvious weakness, possible disfiguring asymm, N symm and tone, incomplete eye closure
- # V : min movement and asymm
- # VI : total paralysis, no movement, obvious asymm at rest

TBH PROF'S CLASSIFICATION:

- # Score each of the following of of 20:
 - Forehead
 - Eyes
 - Nose
 - Mouth
- # Total score out of 80
- # Useful guide for follow-up and monitoring

THANK YOU!!

