Facial Nerve

- **Longest** course (in comparison to other nerves) in **Bony Canal**.
- Nerve of second arch, for facial exp **7000 SVE motor fibres** work in union. In total 10,000 fibres in facial nerves.
- Facial nerve is not completely developed till Adolescence.

**EMBRYOLOGY OF DEVELOPMENT**

**Week 3** – Collection of neural crest cells to become facial nerve identifiable

**Week 5** – Chorda, GSPN, facial motor nucleus

**Week 6** – Genu and branch to posterior belly of diagastric.

**Week 7,8** – Myoblasts form facial muscles

**Week 8** – Nerve to stapedius, Temporofacial and cervicofacial branches of FN

**Week 8**th end – rest of terminal branches

**Week 12**th – all facial muscles are identified

**FUNCTIONAL COMPONENTS**

- GVE – Secretomotor to Lacrimal, Submandibular, sublingual, nose, palatal and pharynx glands.
- GVA – Afferent impulses from above glands
- SVE – Facial muscles and muscles for elevation of hyoid bone
- SVA – Taste from palate and anterior 2/3rd of tongue
- GSomaticA – skin of ear
- GVE and GVA – Salivatory and Lacrimatory nucleus, SVE (Motor nucleus), SVA (NTS), GSA (Spinal nucleus of trigeminal)

**NUCLEUS**

- Brachiomotor
- Superior salivatory nucleus
- Nucleus of Tractus solitaries
- Spinal Nucleus of Trigeminal (for GSA sensations)

**IN CHILD**

- due to absence of Mastoid process and incomplete tympanic ring so the Chorda tympani may pass through **STYLOMASTOID FORAMEN** (in place of petrotympanic fissure)
- Nerve trunk on exit from stylomastoid foramen in child is more anterior and lateral
- 2nd genu in child is more acute and more lateral
In child nerve is very superficial over angle of mandible

**COURSE**

- Supranuclear
- Nuclear
- Infranuclear – Intratemporal & Extratemporal
- **SUPRANUCLEAR**
  - Precentral and postcentral Gyrus ➔ Corticobulbar tract ➔ Genu of Internal Capsule ➔ Upper midbrain to Pons ➔ Facial Principal nucleus located on pons i.e. Branchiomotor nucleus.
  - In cortex tracts to upper parts of face are crossed and uncrossed i.e. bilateral representation whereas to lower part of face are only crossed so contralateral representation. (So cortical lesion spares upper face)

**NUCLEAR SEGMENT**

- Video 😊😊
- Motor nucleus (Brachiomotor nucleus), Parasympathetic fibres, Salivatory and Lacrimary nucleus (Superior Salivatory nucleus), Taste sensation (Nucleus of tractus Solitarius), GSA (touch pain temp from post EAC)(Spinal nucleus of Trigeminal nuclear system)
  - **Brachiomotor Fibres** ➔ move back for principal nucleus ➔ wind around 6th nerve (internal genu) ➔ tent in 4th ventricle (Facial Colliculus) and exit at CP angle or pontomedullary junction (Medial to lateral 6-7-8 nerve) ➔ IAC with 8th cranial nerve till anterosuperior quad of medial wall of middle ear ➔ till geniculate ganglion ➔ 1st genu ➔ turns back into Horizontal canal on medial wall of middle ear ➔ downwards into posterior wall of middle ear i.e. 2nd genu and exit via Stylomastoid foramen (Gives nerve to stapedius on the way (through Pyramid) ) ➔ 1 mm on exiting posterior auricular branch and nerve to stylohyoid and posterior belly of digastric ➔ goes to parotid 5 branches TZBMC
  - Rest three combined form the nervus intermedius (sensory input) ➔ IAC (petrous part of temporal bone) ➔ Anteromedial wall of medial wall of middle ear ➔ Geniculate Ganglion (common pathway for both BM and NI)
  - **GVE** = Superior Salivatory Nucleus Salivatory and Lacrimary fibres (Parasympathetic secretary fibres) ➔ DO NOT relay on Geniculate ganglion
  - Lacrimary Fibres via GSPN ➔ Middle cranial fossa ➔ Foramen Lacerum dips then goes to anterior wall of foramen ➔ along with Deep petrosal nerve (Symp fibres around ICA) ➔ Vidian nerve i.e. nerve to pterygoid canal (GPN + DPN) in pterygoid canal ➔ Sphenopalatine (aka Pterygopalatine ganglion aka nasal ganglion aka Meckel’s ganglion) ➔ RELAY there ➔ Post ganglionic via Zygomatic b/o Maxillary nerve (b/o Trigeminal) goes till Lacrimal nerve (b/o ophthalmic b/o trigeminal) ➔ Supplies Lacrimal gland, nasal glands, PNS glands, palateine glands
  - Salivatory Fibres move with BM fibres ➔ Separate before entering Stylomastoid foramen ➔ enter posterior canaliculus on (posterior wall of middle ear) crosses middle ear and passes via Petrotympanic fissure as Chorda tympani ➔ Go along with Lingual nerve (b/o Mandibular division of trigeminal nerve coming via Foramen ovale) ➔ separates and goes to Submandibular ganglion ➔ RELAYS ➔ postganglionic supply to Submandibular and sublingual glands.
**SVA** = Taste fibres (Nucleus of Tractus Solitarius) ➔ (RELAY GENICULATE GANGLION has cell bodies for Taste fibres SO peripheral process goes to tongue and central to NTS ) ➔ Go with salivatory fibres in same route as Chorda tympani ➔ along with Lingual nerve ➔ taste sensation

**GSA** = Touch Pain Temp fibres (Spinal Nucleus of Trigeminal Nuclear System) ➔ same BM path ➔ via Stylomastoid foramen ➔ Go to posterior auricular branch ➔ Supply posterior EAC

Remember Lingual nerve is B/o trigeminal’s mandibular division and carries only touch pain temp from anterior 2/3rd of tongue.

**Corneal reflex, Stapedial reflex and optic reflex** all have contributions from Facial nerve.

(6 1 2 4) x 4

**INTRACRANIAL PORTION** ➔ Brainstem to IAM fundus (24 mm (6x4)

**INTRATEMPORAL PORTION** ➔ fundus of IAM to Stylomastoid foramen, fallopian canal (28-30mm)

**INTRALABYRINTHINE PORTION** ➔ 4mm (1x4) from fundus of IAM to geniculate ganglion

Immediately posterior to cochlea, posterolateral to ampullated ends of lateral and superior semicircular canals and rests on anterior part of vestibule of this segment

Narrowest at Meatal foramen (0.68mm)

Importance : Thick periosteum here needs to be cut for decompression, Absence of Arterial arcades and Bottle neck deformity may lead to ischaemia, Temporal bone fractures involve labyrinthine segment, During trans labyrinthine approach vulnerable to damage during drilling near SCC.

**TYMPANIC SEGMENT** ➔ 8-11mm (2x4) 1st genu to 2nd genu. Nerve at medial wall of epitympanic recess, turns sharply backwards around the promontary ➔ passes behind processus cochleariformis and tensor tympani, above and posterior to oval window

Bone covering this part is thin and easily fractured (may prolapse in oval window)

**MASTOID SEGMENT** ➔ 9-16mm (4x4) from second genu to stylomastoid foramen 3 branches (Nerve to stapedius, chorda tympani, sensory auricular branch)

**EXTRATEMPORAL PORTION** ➔ 3 branches post auricular, post belly of digastric and stylohyoid

5 branches of facial in parotid, pes anserinus lies lateral to retromandibular vein and ECA.

**KATZ CATALANO CLASSIFICATION** (FACIAL NERVE BRANCHES IN PAROTID):

- Type I  – Zygomatic split and join, Mandibular split and join
- Type II  – Buccal fuse with Zygomatic
- Type III  – Buccal and other branches communication
- Type IV  – Anaestomotic branches before major division
- Type V  – facial nerve leaves skull as more than one trunk

**BLOOD SUPPLY**

- **M MMA P** - Middle Cerebral artery, Middle meningeal artery, AICA, Posterior auricular artery
- Cerebral part by Middle cerebral, AICA supply at CP angle, **Superficial Petrosal artery** b/o MMA supplies geniculate ganglion, Stylomastoid artery b/o posterior auricular supplies mastoid segment. Posterior auricular artery - facial nerve distal to stylomastoid foramen
- Superficial petrosal anastamose with Stylomastoid artery to supply tympanic segment.
- Facial Nerve also has intraneural vascular system which is responsible for maintinance of normal function when the nerve is mobilized.
**BRANCHES OF FACIAL NERVE:**

- **At Geniculate Ganglion** - 3 nerves GSPN, LSPN and External petrosal nerve (an inconsistent branch that carries symp fibres to MMA)

- **Mastoid Segment** - 3 nerves Nerve to Stapedius (at second genu), Chorda tympani nerve (exits between base of pyramid and bony tympanic annulus, traverses canal of Hugier, exits petrotympanic fissure near spine of sphenoid, joins lingual nerve between medial and lateral pterygoid muscles), Sensory auricular nerve supplying skin of EAC

- Branches before entering Parotid ➔ 5
  1. Ansa Haller (inconstant) 1mm at stylomastoid foramen and anaes with 9th nerve
  2. Posterior Auricular Nerve ➔ arises 1-2mm below foramen, Winds around digastric.
  3. Branches to Posterior belly of digastic and Stylohyoid
  4. Communicating branches joins auricular b/o vagus
  5. Lingual branch follows styloglossus and replaces ansa haller

- **5 terminal branches SO TOTAL 16 BRANCHES ☺**

- Except Buccinator, Levator anguli oris and mentalis all other muscles of face supplied by facial nerve

- Masticatory muscles are innervated by the mandibular nerve, a branch of the trigeminal nerve (V) cranial nerve.

**LANDMARKS FOR EXTRATEMPORAL PART:**

- **Conley Tragal Pointer** - 1cm deep and anteroinferior to it
- **Tympanomastoid Suture line** - Nerve lies 6-8mm deep to this suture line (Most Constant landmark)
- **Posterior Belly of digastic tendon** - trace posterior belly of digastic till Digastric groove (its attachment) and nerve is found to lie between it styloid process.
- **Styloid process** - Lateral to it at skull base
- **Tracing terminal branches backwards**
  - Eg. Buccal branch can be traced parallel to but 1cm below the zygomatic arch by joining line between tragus and ala of nose.
  - Mandibular branch is 4 to 4.5 cm away from attachment of lobule, at the angle of mandible.

**LANDMARKS IN MIDDLE EAR AND MASTOID**

- **Cog** - bony ridge hanging from tegmen anterior to head of malleus useful in identifying 1st genu
- **Processus Cochleariformis** - nerve above it. 1mm inferior to the anterior portion of tympanic segment of the nerve.
- **Oval Window** - nerve is above the oval window
- **Lateral SCC** - Posterior to nerve.
- **Retrofacial air cells** (for vertical segment), **Chorda tympani, Pyramid (2nd genu)** is posterolateral to it, **Tympanic Annulus, Digastric ridge**
HOUSE–BRACKMANN SCORE

- The **House–Brackmann score** is a score to grade the degree of nerve damage in a facial nerve palsy. The measurement is determined by measuring the upwards (superior) movement of the mid-portion of the top of the eyebrow, and the outwards (lateral) movement of the angle of the mouth. Each reference point scores 1 point for each 0.25 cm movement, up to a maximum of 1 cm. The scores are then added together, to give a number out of 8. The score predicts recovery in those with Bell's palsy.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Measurement</th>
<th>Function %</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Normal</td>
<td>8/8</td>
<td>100</td>
</tr>
<tr>
<td>II</td>
<td>Slight</td>
<td>7/8</td>
<td>76–99</td>
</tr>
<tr>
<td>III</td>
<td>Moderate</td>
<td>5/8–6/8</td>
<td>51–75</td>
</tr>
<tr>
<td>IV</td>
<td>Moderately severe</td>
<td>3/8–4/8</td>
<td>26–50</td>
</tr>
<tr>
<td>V</td>
<td>Severe</td>
<td>1/8–2/8</td>
<td>1–25</td>
</tr>
<tr>
<td>VI</td>
<td>Total</td>
<td>0/8</td>
<td>0</td>
</tr>
</tbody>
</table>

- In Internal Acoustic meatus horizontal line ie Cristae falciformis separates facial from cochlear and inferior vestibular whereas Vertical is Bills Bar separates from superior vestibular posteriorly.
  - **Nerve to stapedius arises from region outside main nucleus thus NORMAL reflex in congenital 7th nerve palsy but abnormal reflex in brainstem lesions with normal 7th nerve innervations to facial muscles.**
  - Facial nerve via Lesser SPN via otic ganglion (with 9th nerve) give parasympathetic supply to Parotid gland
  - Inferior Salivatory Nucleus → 9th nerve
  - Only 4 parasympathetic ganglion in the body → Submandibular, pterygopalatine, Otic, Ciliary
  - During middle ear surgery the facial nerve is most commonly injured at the pyramidal turn.

Facial Nerve Paresis:

**TOPODIAGNOSTIC TESTS** (nerve branch affected)
- Shirmer
- Stapedial reflex
- Electrogustometry
- Salivary flow testing

**ELECTROPHYSIOLOGICAL TESTS** (NOT for incomplete facial palsy)
- NET (Minimal nerve excitability test) (difference >3.5mA means poor prognosis)
- MST (Maximal Stimulation testing) (5mA stimulation)
Electroneurography (CMAP recorded, Most accurate, If CMAP 10 percent of normal side means 90% axon degeneration)

- Antidromic potentials
- Magnetic stimulation
- Acoustic reflex potential
- Electromyography

ENG = Electronystagmography, ENoG = Electroneurography

**ETIOLOGY**: Birth (dystrophia myotonica, Mobius syndrome - facial diplegia with other cranial nerve deficits), Traumatic, Neurological (Opercular syndrome - cortical defect in facial motor area, Millard gubler syndrome (6th palsy with contralateral hemiplegia)), Infections, Idiopathic

- Neuropathophysiological basis facial nerve disorders:
  - Seddon classification (Neuropraxia (partial block of axoplasmic flow), Axonotmesis, Neurotmesis)
  - in Axonotmesis axon sectioned so complete block of flow, in 3 4 days wallerian degeneration occurs distally till the motor end plate and proximally till nearest node of ranvier so distal stimulation fails to produce muscle contraction. Regeneration occurs at 1mm/day.

**BELL’S PALSY**

**DIAGNOSTIC CRITERIA**

1. Palsy/paresis of all muscles of one side of face
2. Acute onset with rapid evolution <48hrs
3. Absence of CNS disease
4. Absence of CP angle abnormalities / ear discharge

**INCIDENCE**

- 15 – 45 yrs more common, < 20yrs females more prone, > 40 yrs males more prone
- Diabetes incidence 2.5 times more common in patients with recurrent bell’s palsy

**ETIOLOGY AND PATHOGENESIS**

- Microcirculatory failure of vasa vasorum
- Ischemic neuropathy, infectious causes
- Genetic
- Immunological
- Vascular Causes: Labyrinthine segment of facial canal occupies 80% of cross sectional area. Meatal foramen +, periosteal circumferential bands constitute pressure transition zone or physiological bottle neck.
- Why less in Paediatric population – as ratio of CS area of Nerve to meatal foramen is smaller. (Meatal foramen is primary pathophysiological site)
- Diffuse involvement of 7th nerve implies Viral neuritis.
- Intraneural Vascular congestion and Haemorrhage can occur
- Infectious Org : HSV I (MC), HSV II, VZV, Coxsackie virus, EBV
- Ischaemic Insult : MMAP
● **Immunological Theory** : Segmental demyelination with lymphocytic infiltration of the perineurium implies autoimmune mechanism.

**CLINICAL FEATURES :**

● **Viral Prodrome**
  ● Acute onset unilateral recurrent facial nerve palsy (in <48 hrs)

**ON EXAMINATION**

Bells phenomenon, Chorda tympani appears red on otoscopy within 10 days of onset of palsy

**POOR PROGNOSIS**

● Old age, complete palsy, Dry eye, Stapedial reflex absent, Post aural pain, pregnant, after 6 mnths

**INVESTIGATIONS**

**TREATMENT**

● Steroids, Antivirals, Physical treatment (Eye care, physiotherapy, electrical stimulation), Surgical decompression

**MARSH AND COOKER CRITERIA**

● Complete Denervation
● Palsy >4-6weeks
● Incomplete recovery even after 60 days
● Recurrent facial palsy
● NET shows a difference of 3.5 Ma
● > 50% tear flow reduction on Schirmer test then total decompression or middle cranial fossa approach is indicated.

**MELKERSON ROSENTHAL SYNDROME :**

● Systemic granulomatous neuro-mucocutaneous disease
● **TRIAD** - U/L facial palsy + Fissured tongue + Facial Oedema or Labial oedema
● **ETIOLOGY** :
  1. Infection (Crohns, sarcoidosis)
  2. Allergy (contact allergies)
  3. Hereditary / familial (AD)
  4. Autoimmune
● Generalized autoimmune dysfunction manifests as vasomotor instability than inflammatory condition

**CLINICAL FEATURES :**

● LMN facial palsy
● Swelling of lips and face for months to years
● Lingua plicata (before 20yrs only fissured tongue)
● Usually good to excellent recovery
DD : Heerfordts syndrome

Treatment :
Medical, Surgical, Eye care, Physiotherapy

MALIGNANT OTITS EXTERNA :

Definition :
Aggressive life threatening infection of soft tissues of ext ear and surrounding structures spreading to involve periosteum and bone of skull.

Pathology :
Progresses through cellulitis, perichondritis, chondritis, periostitis, osteitis and finally osteomyelitis

Bacteriology :
Peudomonas aeruginosa (95%), Aspergillus especially (NON DIABETICS)

Predisposing Factors
Early diabetics (Type I and II) (microangiopathy in diabetes mixed with vasculitic properties of pseudomonas)
AIDS
Immunocompromised

Clinocopathological Classification :
Stage I  - Evidence of MOE with extension beyond EAC
Stage II  - Tc99 bone scan is positive
Stage III  - Cranial nerve involvement (IIIa - Single, IIIb - Multiple)
Stage IV  - Meningitis, empyema, sinus thrombosis or brain abscess

Outcomes and Complications :
Cranial nerve deficits (7th MC then 9,10,11)
May involve Clivus & contralateral temporal bone
Anterior spread - may involve TMJ, carotid vessels, sphenoid, parapharyngeal space
Disease can spread to venous sinuses, extradural space and meninges.
Complete resolution on Rx in 22% and partial in 9% cases

Management :
Aural toileting
Systemic long term antibiotics (fluoroquinolones 6weeks to 6months)
Hyperbaric Oxygen as adjuvant
Surgery i.e. removal of sequestra and pus collection debridement of necrotised and granulating tissues done

RAMSAY HUNT SYNDROME :
aka Herpes zoster oticus

DEFINITION :
defined as herpetic rash on EAC, concha, pinna with ipsilateral LMN facial palsy

CAUSE :
Reactivation of VZV in the trigeminal ganglion or spinal vestibular ganglion of 8th nerve
**DIAGNOSIS**:

- Auricular pain is 1st symptom followed by cranial nerve palsies
- Variable degrees of 8th nerve involvement leading to TVH (tinnitus, vertigo and hearing loss)
- Rash appears later
- Their can be tongue and pharyngeal mucosal rash also seen (cutaneous and mucosal)

**INVESTIGATIONS**:

- rise in serological titres of zoster DNA without rash and with 7th nerve palsy.

**TREATMENT**:

- Steroids, Antivirals, Physical treatment (Eye care, physiotherapy, electrical stimulation)

**TEMPORAL BONE FRACTURES**

- MC is **LOGITUDINAL** (blow to temporal bone directly) involves external and middle ears leading to bleeding from ear, Ossicular discontinuity, facial nerve canal usually **spared** but palsy occurs due to nerve oedema and thus late in onset.
- Transverse fractures usually damage inner ear, 50% patients develop facial palsy (tympanic and mastoid segment)
- **MC cause of surgically induced 7th palsy is at 2nd genu, tympanic segment.**
- Causes → Inadvertent handling of incus, TORP PORP, widening aditus via antrum might damage dehiscent second genu, mastoidectomy in contracted antrum injures mastoid segment, posterior tympanotomy, lowering facial ridge or removal of posterior buttress, post auricular incision in children if not horizontally placed.

**Advantages of Steroid therapy**:

- Hastens recovery
- Prevents aberrant regeneration and thus prevents syndromes like freys and crocodile tears
- Prevents progression of incomplete to complete palsy
- Reduces post herpetic neuralgia
- Also reduces residual weakness

**Facial Nerve Decompression**

- **Timing** : within 72 hrs
- **Indication** : < 10% or less muscle function on ENoG, with absent voluntary muscle action potential on EMG
- **Method** : Done by removing the facial fallopian canal all around with widening of the canal with diamond burrs. Perineural and epineural sheaths are split open (to drain perineural or intraneural edema / haematoma)
- Surgical Approaches:
  - **Retrolabyrinthine Approach** :
  - for exposure from brainstem to IAC.
Procedure:
- Incision - 3-4cm behind postaural crease – Cortical Mastoidectomy – Blue lining of sigmoid sinus, sinodural angle, jugular bulb and posterior SCC – Trautmann’s triangle drilled, endolymphatic sac and posterior fossa dura exposed – anterior based cerebellar dural flap elevated – sigmoid sinus retracted (7 and 8 cranial nerves identified 2-3mm below Donaldson’s line) – arachnoid incised and CSF drained from cistern – 5,9,10 cranial nerves identified – facial nerve now decompressed – water tight closure with subdermal abdominal fat placement.

**ADVANTAGES:**
- Access without inner ear sacrifice
- Minimal cerebellar compression as compared to suboccipital approach.

**Disadvantages:**
- 8th nerve hampers 7th visualisation and can lead to hearing loss
- Reduced intracranial exposure so intracranial vascular complications very difficult to manage

**Complications:**
- CSF leak, Hearing impairment, cerebellar compression, vascular intracranial complications

**MIDDLE CRANIAL FOSSA APPROACH:**
- Exposure from IAC to Tympanic segment (for intracanalicular and labrynthine segments)
- **INDICATIONS:**
  - Bells palsy, longitudinal temporal bone fractures
- **Advantages:**
  - No hearing impairment, even geniculate ganglion and tympanic segment can be decompressed, when combined with retrolabyrinthine, transmastoid entire facial nerve can be seen.
- **PROCEDURE:**
  - 6x8cm trap door incision above ear (with postaural incision)
  - 4x4 cm temporalis fascia graft harvested
  - Anterior based temporalis musculo perisosteal flap elevated
  - A bone flap centered over zygoma elevated, taking care middle meningeal artery on inner table
  - Dura elevated from posterior to anterior till petrous ridge, arcuate eminence, meatal plane, and GSPN Anteriorly.
  - Blue lining of superior semicircular canal seen
  - Anterior to it IAC opened with 7th nerve anterosuperiorly (BILLS BAR FORMS LATERAL BOUNDARY OF MEATAL FORAMEN)
  - Labyrinthine segment followed laterally till geniculate ganglion.
  - Tegmen tympani removed
  - Tympanic segment blue lined and final layer of bone removed with elevator and decompressed
  - Bone flap replaced, with temporalis fascia over it to seal the defect.
  - **Complications:**
    - CSF leak, CHL/SNHL, meningitis, bleeding from AICA, brainstem and cerebellar infarction - Injury to AICA

**TRANSMASTOID APPROACH**
- from geniculate ganglion to stylomastoid foramen
- **Procedure**:
  - Cortical mastoidectomy
  - Posterior tympanotomy (for geniculate ganglion exposure incus needs to be removed and replaced back (CHL may occur)

**Indications**:
- Longitudinal fractures of temporal bone (only mastoid segmental involvement)
- AOM COM involving only tympanic segment and genu
- Isolated mastoid fracture
- Infections involving the mastoid segment

**Limitations**:
- Limited access to geniculate ganglion
- No access to labyrinthine segment

**TRANSLARYNTHINE APPROACH**:

- **Indications**:
  - 7th and 8th nerve function already lost
- **Advantages**:
  - Entire nerve is exposed using single approach
  - If interposition graft is required enough working space is available even at the level of brainstem
- **Limitations**:
  - Hearing and balance function loss, CSF leak, Infections

**Combined Approaches**:
- Middle cranial fossa approach with transmastoid used manyatimes

**Re Routing techniques**:

in case of geniculate ganglion injury (longitudinal temporal bone fractures) resect geniculate ganglia and reapproximate labyrinthine segment with tympanic segment through middle fossa approach.

**FACIAL REANIMATION**:

**Dynamic Reconstruction**:

**Nerve repair and grafting**:
- Nerve ends freshened using razor at 45° to expose maximum neural tubules and improve regrowth of the nerve and epineurium approx using 10-0 prolene/nylon.
- For interposition grafting Sural nerve or Greater auricular nerve.
- Greater Auricular Nerve located Midway perpendicular to a line joining mastoid tip and angle of mandible. (preferred as similar diameter to facial nerve)
- Sural nerve imm posterior to lateral malleolus along with saphenous vein. Preferred if long length required (8-10cm). The peripheral portion of nerve has many branches that can be used to reconstruct the branching pattern of facial nerve.
- Nerve graft should be 10 to 20 percent larger in diameter than 7th nerve and long enough to ensure tension-free anastomosis.