TRIGEMINAL NEURALGIA

INTRODUCTION

- ***PAIN IN THE MAXILLOFACIAL REGION CAN BE DUE TO VARIOUS CAUSES OF NON-ODONTOGENIC ORIGIN ARE TRIGEMINAL NEURALGIA,GENICULATE NEURALGIA, ETC., EACH HAS ITS OWN CHARECTERISTICS CLINICAL FEATURE.SUCH PATIENT USUALLY VISIT MANY PHYSICIANS BEFORE CONSULTING AN ORAL AND MAXILLOFACIAL SURGEON.***
- ***IT IS THUS IMPERATIVE TO DISTINGUISH BETWEEN DIFFERENT PAIN CONDITIONS FOR PROPER MANAGEMENT.***

DEFINITION

- **Paroxysmal , intense , intermittent pain that is usually confined to specific nerve branches of head and neck.**

History

- First occurrence
- Timing
- Quality
- Treatments
- Associated symptoms
- Precipitating factors

Past Medical History

- Head injuries, infections, surgeries
- Psychiatric diagnoses
- Medications
  - Analgesics
  - Herbal medications
  - Antihypertensives & vasodilators
- Alcohol, tobacco, drugs

Physical Examination

- Complete head & neck exam
  - Cranial nerves
  - TMJ & muscles of mastication
  - Trigger points
- Neurological exam

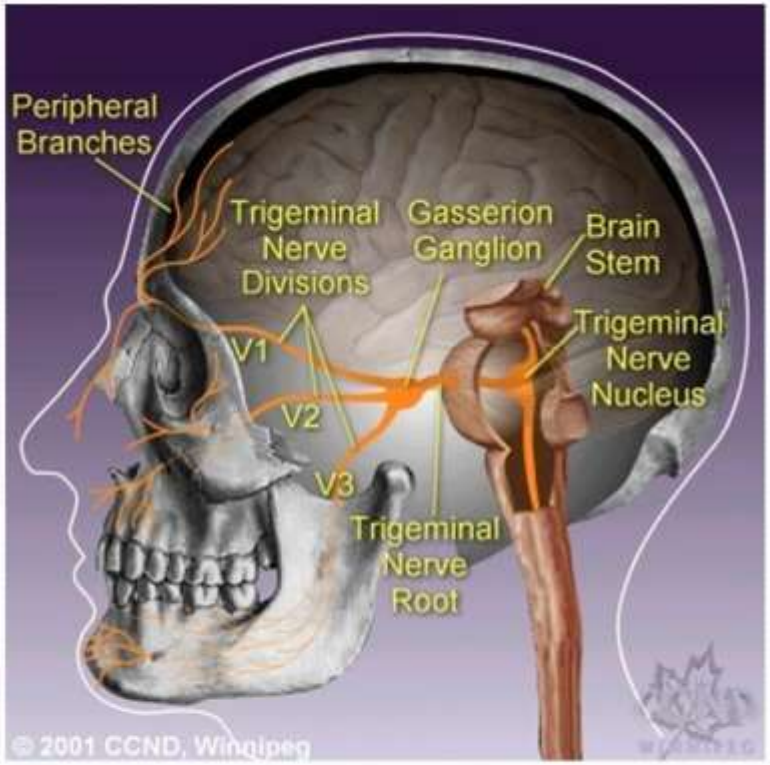
Diagnostic Tests

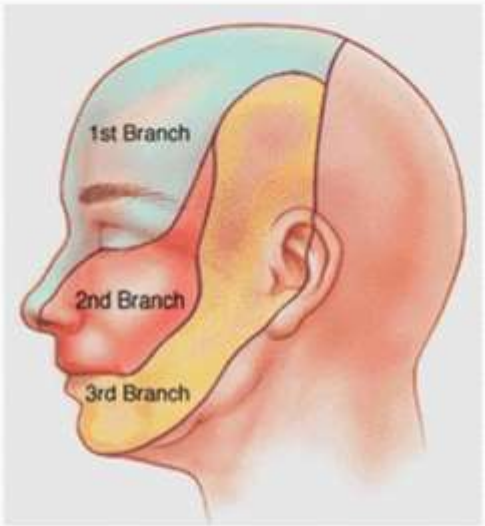
- EEG
- CT and/or MRI
- EMG

Trigeminal Neuralgia

- ***Trigeminal neuralgia is defined as unilateral paroxysmal, sharp, stabbing, lancinating, intermittent pain usually confined to the distribution of one or more branches of fifth or trigeminal nerve***

ANATOMY OF TRIGEMINAL NERVE

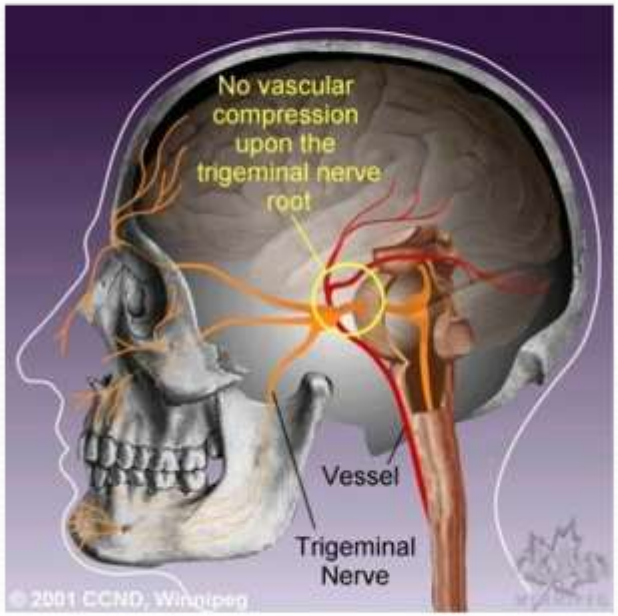


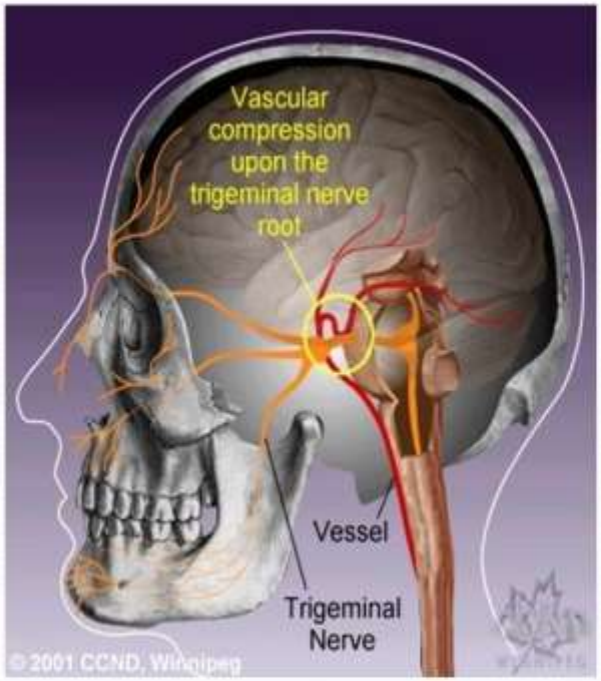


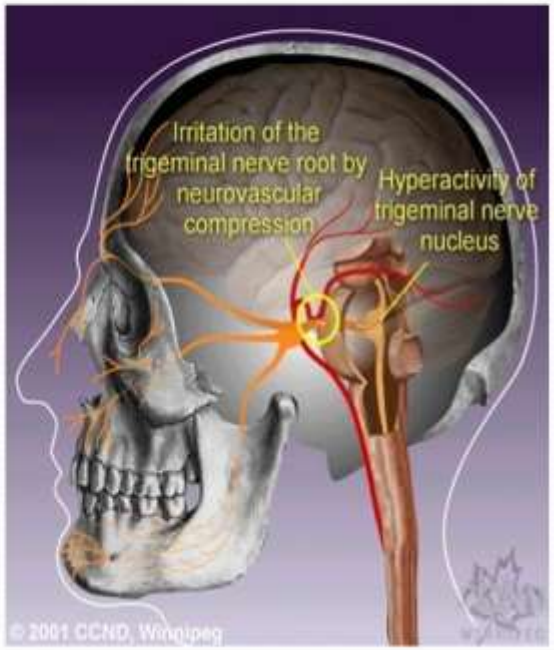
Etiology and Pathophysiology

- TN may be idiopathic (primary) or symptomatic (secondary).
- Most cases of idiopathic TN are the result of vascular compression of V nerve near its entry into the pons
- Odontogenic, infections,viral,post traumatitic neuralgia
- Symptomatic causes include: multiple sclerosis, tumors, and basilar artery aneurysm.
- Pathophysiology is not fully elucidated. Demyelinative lesions of trigeminal fibers appear to set up ectopic generation of spontaneous nerve impulses and their conduction to adjacent fibers.

Compression on ganglion







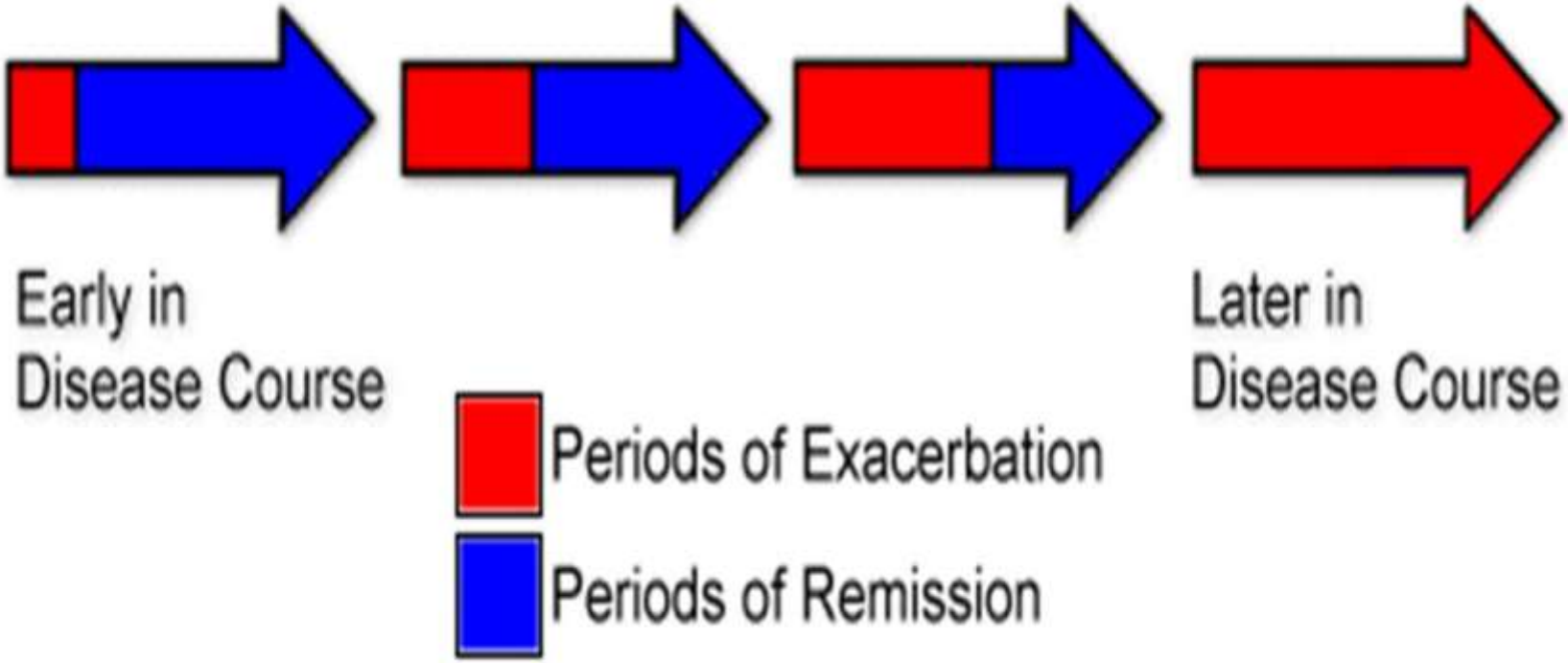
TN Clinical Features

- It occurs mostly after 5th decade.
- Common in females & in old age.
- Incidence per year has been reported as 2.7 in 100.000 men and 5 in 100.000 women and that to on right side(60%).
- Pain is mostly confined to $V_2$and V_3 and rarely with V_1.
- Pain rarely crosses midline.
- Pain is of short duration and it become more intense & unbearable , last for few seconds & recur with variable frequency.
- Paroxysms occur in cycles.

TN Clinical Features

- Pain is frequently triggered by trivial stimulation: touching of face, washing, shaving, chewing and talking, no attacks while sleeping.
- During attack of pain, pt clutches his hands over affected side of the face, stopping all activities.
- In order to avoid attack of pain,pt avoids shaving and brushing of teeth.
- Patient have motionless face- “frozen or mask like face”.

Progression of Trigeminal Neuralgia Over Time



Diagnosis

- TN remains a clinical diagnosis.
- A careful search for ipsilateral dental pathology should be undertaken.
- Diagnostic nerve blocks: -inject 0.5cc of normal saline at test site.After 5 min if pain is relieved, then psychogenic pain is likely
- -If pain persists, then inject 0.5ml of 2% lignocaine without adrenaline at surface site. After 5 min if pain is relieved, then direct therapy at small nociceptor fibres.

- If the pain persists inject little deeper.after 5 mins if pain is relieved , then consider musculoskeletal origin of pain
- If pain is not relieved , inject at more proximal portion of nerve – if pain is relieved, direct therapy at site, when relief occured
- Routine imaging is generally not indicated.
- MRI can be performed if there is suspicion of underlying pathology.

Specific test

- Carbamazepine is universal in TN, as in other types of facial pain it is not useful. Many clinicians use this response as a step in definitive diagnosis of the conditions. Failure to obtain any improvement with this t/t should bring the diagnosis into ?

During attack **After diagnostic injection**

Treatments – Medical

- CARBAMAZEPINE (tegretol) & PHENYTOIN (dilantin) are mainly used.
- Carbamazepine 100 mg tds for 1-5 weeks until remission is achieved.
- S/E:visual blurring ,dizziness ,somnolence, skin rashes , ataxia ,& rarely hepatic dysfunction, leukopenia, thrombocytopenia-aplastic anemia.whenever s/e appear ,a reduction of 200mg of drug will often eliminate them. Once the pain remission has been achieved ,the drug dose should be kept at maintainence level or withdrawan and restarted if symptoms appear

- Complete blood count with platelet count ,liver function screening should be done prior to treatment ,a month after treatment & at 3-4 months intervals,particularly if the patient continues to receive high dose(1000-1500mg/day).
- If the carbamazepine does not control the symptoms adequately ,then another anticonvulsant like sodium valproate 600mg /day or amitriptyline can be added.
- Coadministration of phenytoin or baclofen is also advocated.

- If carbamazepine is contraindicated CLONAZEPAM 1.5mg can be used. Side effects – drowsiness,fatigue,lethargy
- Tab.Phenytoin 100mg tds

  Side effects-slurred speech,abnormal movements,swelling of lymph glands,gingival hypertrophy,folate deficiency.

  Tab.Oxcarbazepine 1200mg/day

  Side effects-hyponatremia,double vision.

  Valproic acid 600mg/day

  Side effects-irritability,tremors,confusion,hepatotoxicity, weight gain

  Mephenesin carbamate 5-15 ml/5times a day to every 3 hrs

- Other less toxic agents:
- Baclofen 10mg tds

  Side effects-fatigue, vomiting
- Gabapentine
- Lamotrigine
- Felbamate
- Topiramate
- vigabatrin

Surgical

- Peripheral injection.
- Peripheral neurectomy.
- Cryothearpy
- Peripheral radiofrequency neurolysis
- Gasserian ganglion procedures

a.glycerol injection

b.radiofrequency thermocoagulation

c.balloon compression

Surgical

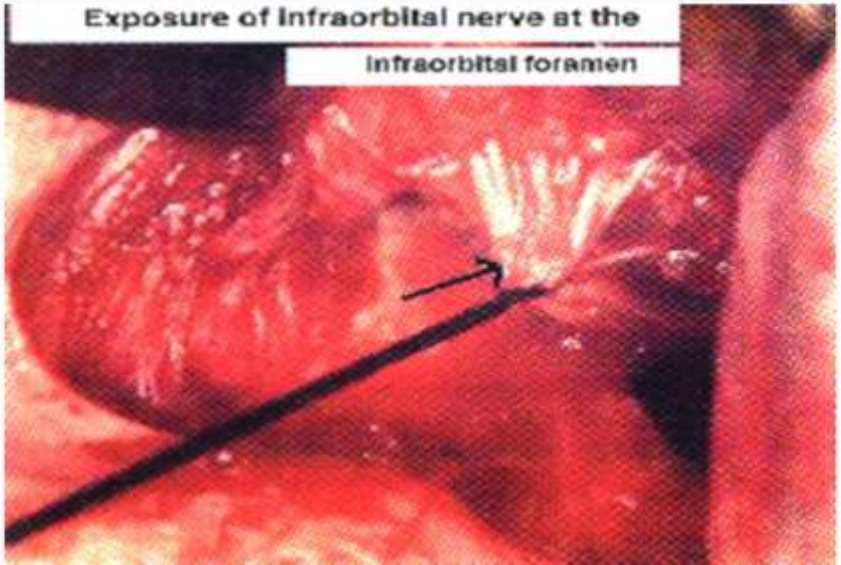
- Peripheral nerve surgical treatment
- 1.peripheral injection
- a.long acting anesthetic injection- Bupivacaine without adrenaline at the most proximal nerve site, for emergency measure.injection can be repeated when pain recurs.

- Alcohol injection
- Injection of 95% absolute alcohol in small quantities(0.5-2ml).This produces anesthesia of the region.Repeated alcohol injection should avoided as it causes local tissue toxicity,inflammation and fibrosis or burning alcohol neuritis.
- Provides relief for period 6-12 months or sometimes patients come back with pain within short time span.
- Extra oral injection into maxillary and mandibular division of TN at the level of base of skull also can be given.
- Peripheral injection- infraorbital,mental,inferior alveolar nerve blocks depending on involvement.

Peripheral neurectomy-nerve avulsion

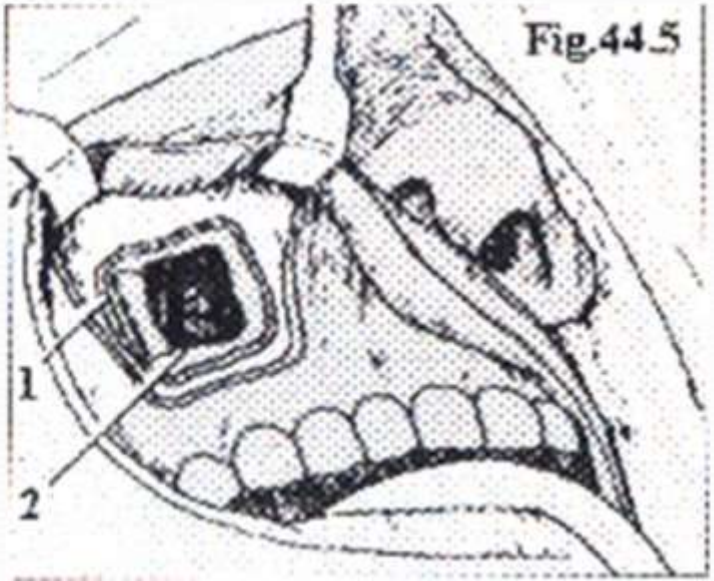
- Infraorbital neurectomy – can be performed through Intraoral conventional approach and Braun's transantral approach.
- Inferior alveolar nerve neurectomy – can be performed through intraoral and extraoral approach
- Lingual nerve neurectomy

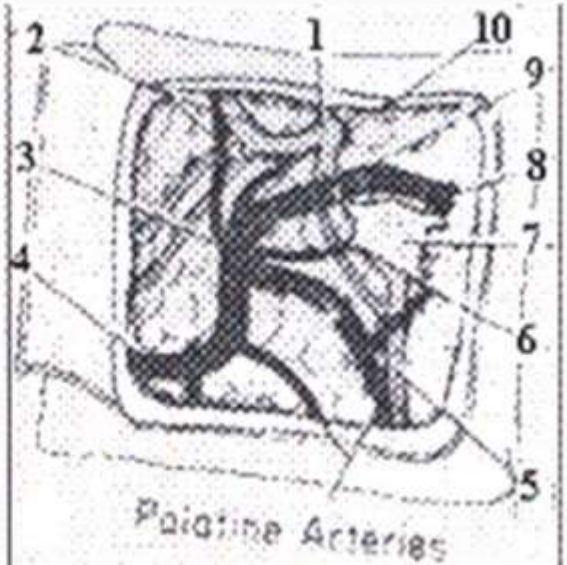
- Infraorbital nerve neurectomy
- Intraoral conventional approach – U shaped caldwell-luc incision in the upper buccal vestibule in the canine region.once the nerve is exposed all peripheral branches are held with the hemostat and avulsed from the skin surface,entire trunk from foramen is removed.



Braun's transantral approach.

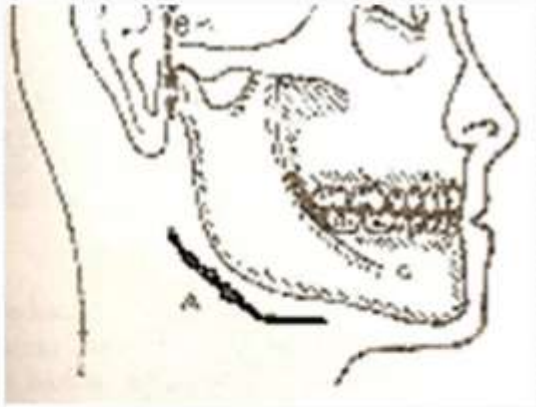
- Intraoral incision from the maxillary tuberosity to the midline in the maxillary vestibule.reflecting flap expose the anterior and lateral maxillary antral wall,infraorbital nerve.

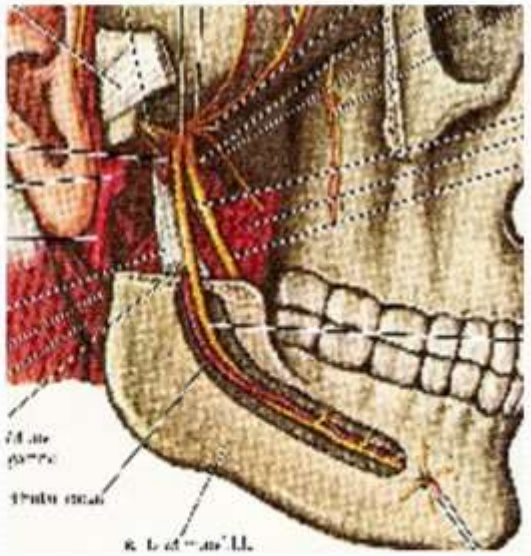




Inferior alveolar neurectomy

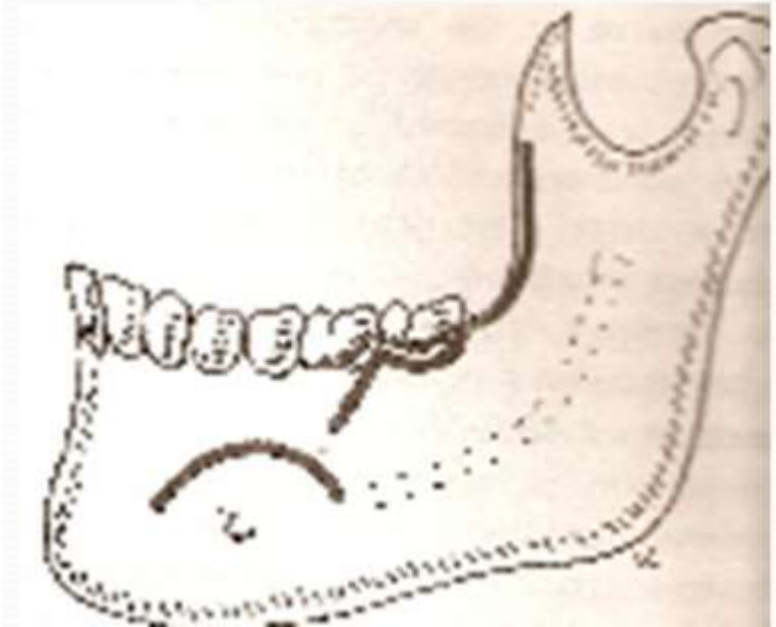
- Extraoral approach-
- Through Risdons incision after reflection of masseter, a bony window is drilled in outer cortex and nerve is lifted with nerve hook & avulsed from superior attachment and mental nerve avulsed through same approach





Intraoral approach- Dr Ginwalla's approach

- Mainly used in dentulous cases
- Incision along the anterior border of ascending ramus,extending lingualy buccally and ending in to fork like an inverted Y
- Another linear incision is made in the buccal vestibule overlying mental foramen.



Lingual neurectomy

- A vertical incision is made at the inner border of the ascending ramus , extending from the coronoid process down the level of floor of the mouth.
- In the region of the floor of the mouth the nerve can be easily found between anterior pillar of the fauces at the root of the tongue after dissection, the nerve is grasped with hemostat and then avulsed or cauterized and cut.

Cryotherapy

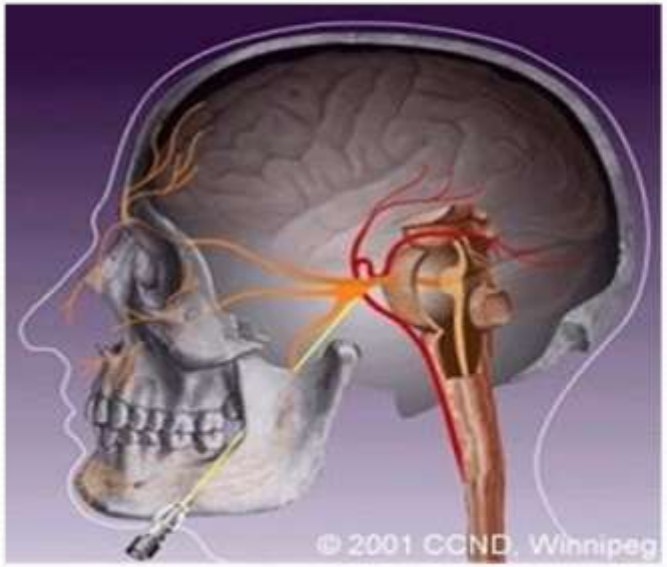
- Direct application of cryotherapy probe at temp colder than –600 c are known to produce wallerian degeneration without destroying the nervesheath itself, nerve is frozen with cryoprobe(N_2O Probe)for period of 1-2 min followed by 3 min thaw,to be repeated three times.

Peripheral radiofrequency neurolysis(thermocoagulation)

- Gregg and small in 1986,reported surgical management of trigeminal pain with radiofrequency lesion of peripheral nerves.
- Neurolysis has been shown to induce pain remission.
- Radiofrequency electrode that has the capacity to definitely destroy pain fibers is used in this procedure.
- It produces ionisation of biological tissue.heat results from ionic friction, which leads to coagulation of tissue.

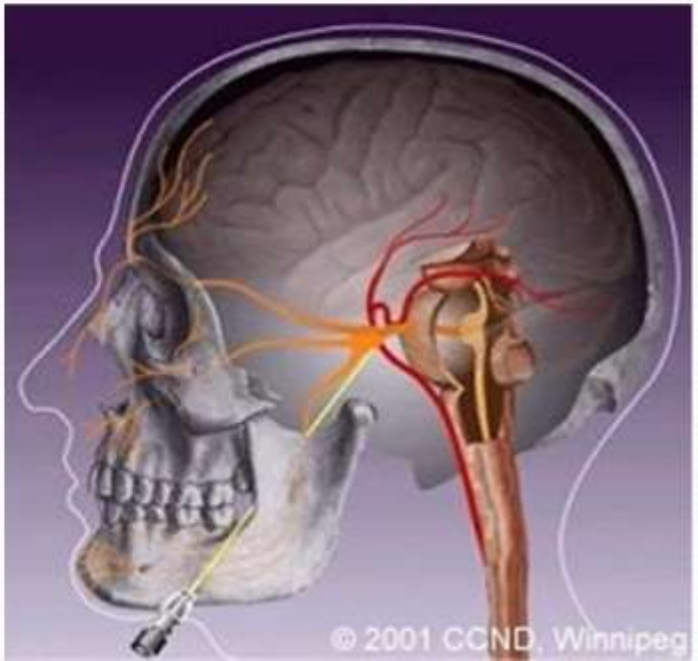
Gasserian ganglion procedures

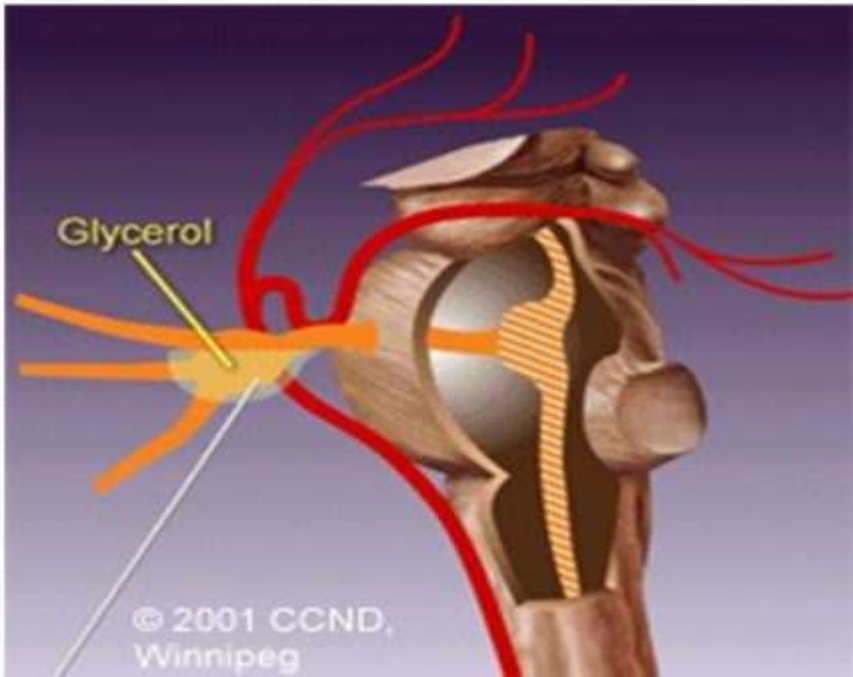
- 1.Glycerol injection.
- 2.Thermo coagulation.
- 3.Balloon compression.
- Technique of needle placement common for above.i,e.,hartel's 3 point marking



Glycerol injection

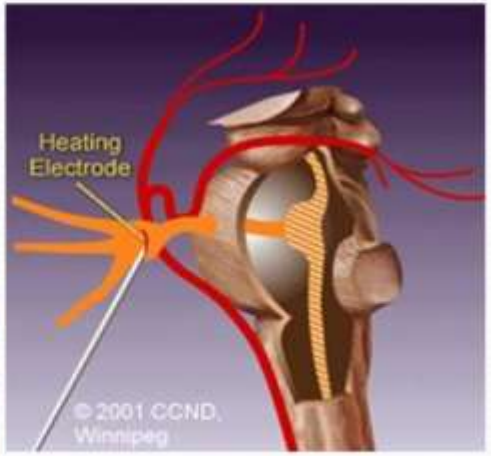
- Glycerol or absolute alcohol used for percutaneous ganglion neurolysis, agent is 0.1-0.2ml injected into meckels cave , or in ganglion producing low grade damage to nerve cells presumably through dehydration.
- Relief is obtained varies from 6months-2years





Controlled radiofrequency thermocoagulation

- Placing 22 guage probe under fluroscopic guidence.
- Thermal lesions of 30-90 sec duration are made at 65-75°C using RF generator of microwave energy.
- A 5mm bare tip electrode with 2mm diameter will produce a lesion of 10*6mm with trigeminal root at 75°c.



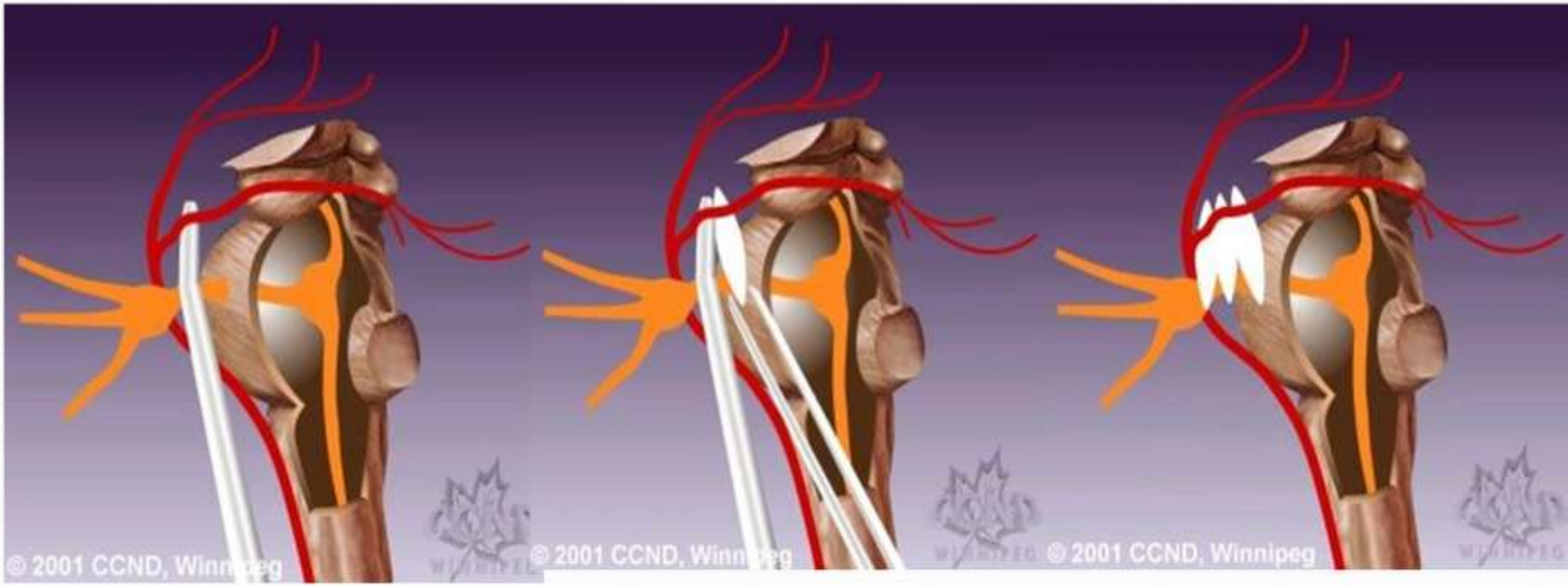
Balloon Compression

- Mechanical tech. To destroy root fibers partially by advancing 4FG forgarty catheter 1-2 cm within meckels cave and inflatting balloon at the ventralm aspect of ganglion root.
- 12 guage spinal needle is passed first to foramen ovale and balloon catheter is passed through it.
- Once it is in position, balloon is inflated and take up pear shaped of meckels cave for 1 min.

Microvascular Decompression

- Reported by junnetta in 1967-1976.
- Commonly performed intracranial open procedures.
- Comressing branch of superior cerebeller artery will be seen medial to the nerve at root entry zone.
- The artery is carefully separated from the nerve and interpositioned by using sponge or teflon wool.
- Morbidity includes facial dysaesthesia, cerebellar injuries and hearing loss.

Microvascular Decompression of V nerve



Gamma Knife

- Single high dose radiotherapy delivered with exquisite precision to a radiographically defined target, at the junction of trigeminal nerve and brain stem.
- Several series of small numbers of patients report high rates of pain relief, with low rates of morbidity, mostly facial numbness.

Review of Treatments - Alternative

- Acupuncture
- Botulinum Toxin (Botox)
- Homeopathy
- Hot / Cold Compresses
- Hypnosis
- Low Intensity Laser
- Lidocaine Cream / Patch
- TENS (Postherpetic N.)
- Vitamin B12
- Yoga / Biofeedback

DIFFERENTIAL DIAGNOSIS

- Dental diseases
- MPDS
- Bells palsy
- Nutritional neuropathies
- Toxic neuropathies
- Atypical facial pain

CONCLUSION

- History most important in making accurate diagnosis
- Recognize aspects of pain and proper planning of treatment