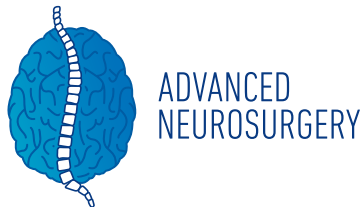


Trigeminal Neuralgia

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Neuropathic facial pain

- pain around the mouth or face that arises from a primary lesion or dysfunction of the nervous system
- Trigeminal neuralgia
- Glossopharyngeal neuralgia
- Geniculate neuralgia

DDX

- Post-herpetic neuralgia, MS, CP angle tumour, Ramsay Hunt,
- Dental pain, TMJ
- Temporal arteritis
- Head and neck cancer, sinusitis
- Glaucoma, optic neuritis
- SUNCT
- Ophthalmological causes
- Raeders, Gradenigos
- psychogenic

Trigeminal neuralgia

- 4-5/100000
- Severe sharp stabbing/ lancinating unilateral paroxysmal pain in 1 or more distributions of CN V (V1 least common)
- Usually no sensory deficit in the absence of prior intervention
- F:M = 2:1
- Peak age 50-60
- Classified as primary/classic
or secondary (MS, CP angle tumour)
- Burchiel : TN1 –classic, TN2 : constant

Pathophysiology

- Vascular compression at Obertseiner-Reidlich zone (root entry zone): change from CNS to PNS (oligodendrocyte to Schwann cell)
- Plaques of demyelination lead to hyperexcitability of injured afferents
- ectopic impulse discharge, spontaneous and triggered afterdischarge, and cross-excitation among neighboring afferent fibers (ephaptic transmission)
- Non-nociceptive stimuli perceived as pain

Risk factors

- MS
- Hypertension
- Familial tendency
- Female sex
- Old age (?elongation of cisternal arteries)

Diagnosis

- Purely clinical;
- MRI to exclude other pathology
- Quantitative sensory testing (QST), evoked potentials

TN Mx historical perspective

- 17th Century John Locke: described in wife of English Ambassador to France : GI cleansing
- 1756 Nicholas Andre coined the term tic douloureux
- 1829: Charles Bell described anatomy of CN V
- 1920: Harris injected alcohol via foramen ovale
- 1934: Dandy described vascular conflict
- 1942: Bergouignan administered phenutoin (accidentaly!)
- 1940s : Leksell performed radiosurgery
- 1959: W.James Gardner performed first MVD (later popularised by Janetta)
- 1962: CBZ
- 1974: Radiofrequency ablation
- 1981: Hakanson: glycerol injection

Medical management

- CBZ : 1st line (upto 1000mg/d)
- SE: drowsiness, dizziness, constipation, ataxia, and syndrome of inappropriate diuretic hormone, rashes, leukopenia, and abnormal liver function tests
- Evidence: 4RCT

- Oxcarbazepine
- Phenytoin
- Gabapentin
- Lamotrigine
- Baclofen
- Pregabalin

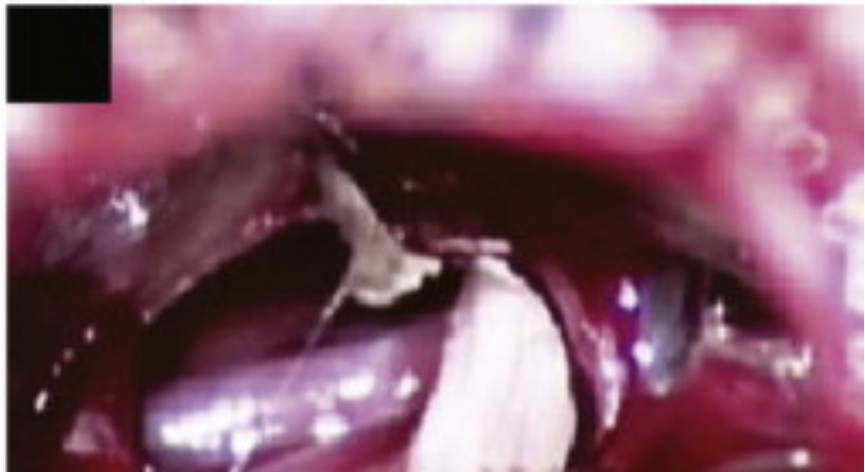
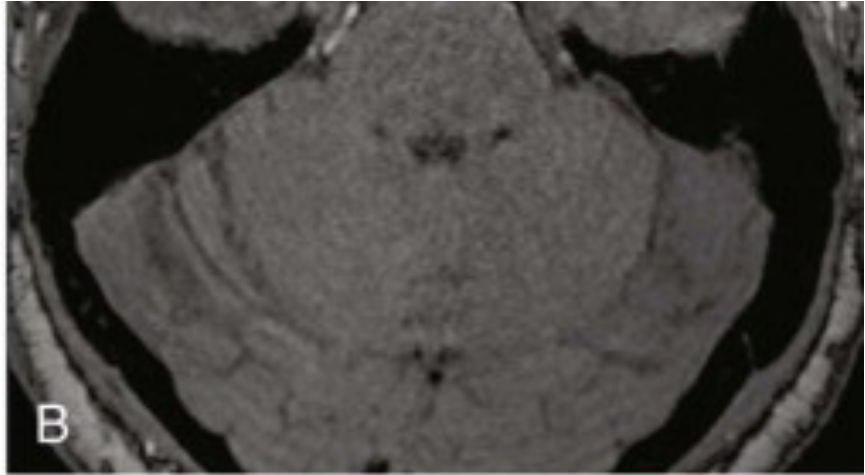
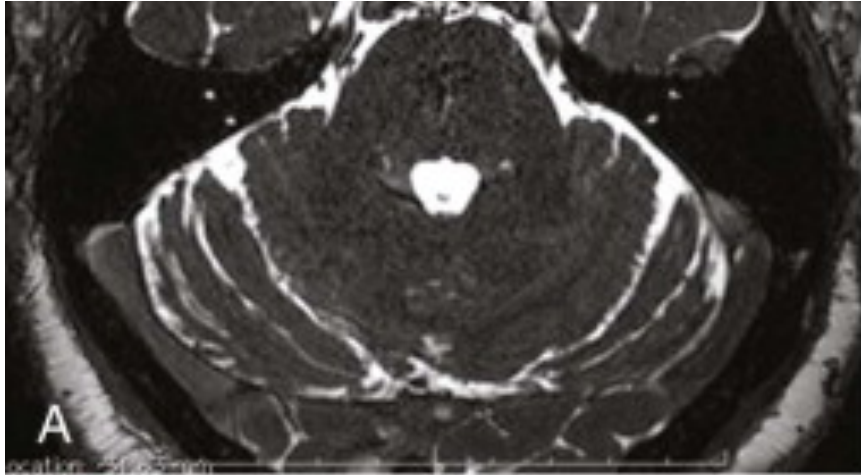
Microvascular Decompression

- Tried and tested
 - Longest lasting
 - Facial dysaesthesia and numbness rare
 - May be performed after failed lesioning procedure
 - Greatest patient satisfaction
-
- Invasive
 - Expensive

Indications

- Young
- Failed medical therapy
- MS excluded
- TN 1

MRI/intra-op



Operative procedure

- Supine head turned / lateral
- Incision $\frac{1}{4}$ above inio-meatal line, 2 fingerbreadths behind ear
- Retrosigmoid craniotomy
- C-durotomy
- Brain relaxation
- Wax mastoid air cells
- May need to divide sup. Petrosal vein
- SCA most common culprit
- Shredded teflon ball b/w vessel and nerve
- If no conflict found, may partially section nerve along antero-inferior aspect
- Watertight dural closure, cranioplasty
- Return to baseline activity 4/52 post-op

Complications

- Hearing loss
- Vertigo/tinnitus
- Facial palsy
- CSF leak
- Aseptic meningitis
- Infection
- Cerebellar contusion/infarction

Outcome

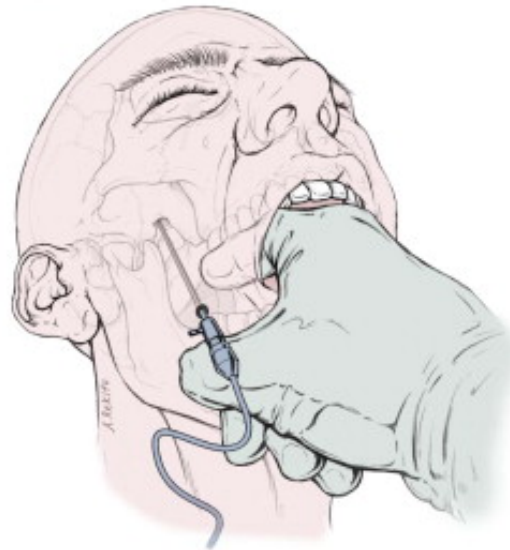
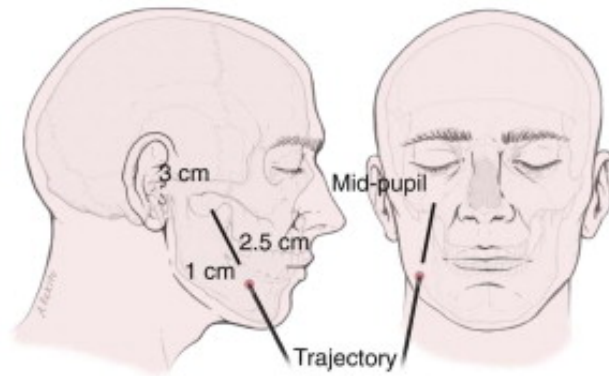
- 75% complete and 9% partial relief at 1 year (Barker, Janetta et al NEJM 1996)
- 63% pain free at 20 years
- Annual rate of recurrence 2% upto 10 yrs , then 1%
- ?worse prognosis with venous compression, TN2, previous lesioning

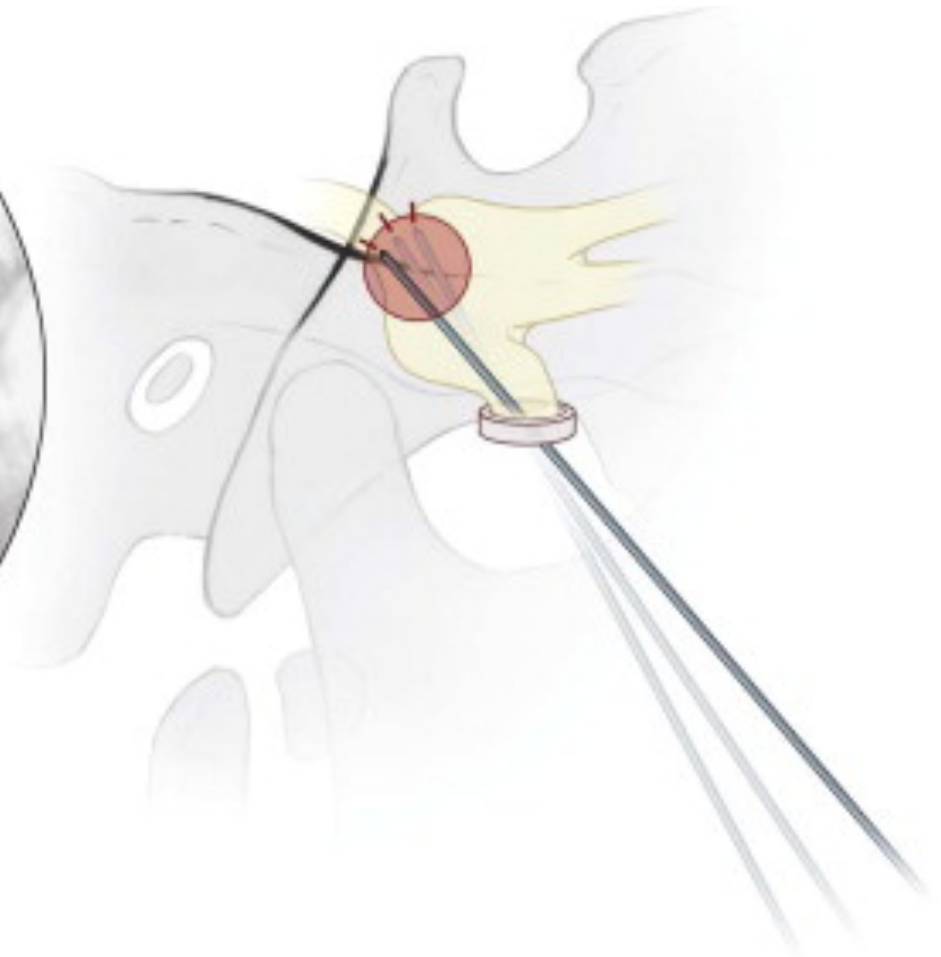
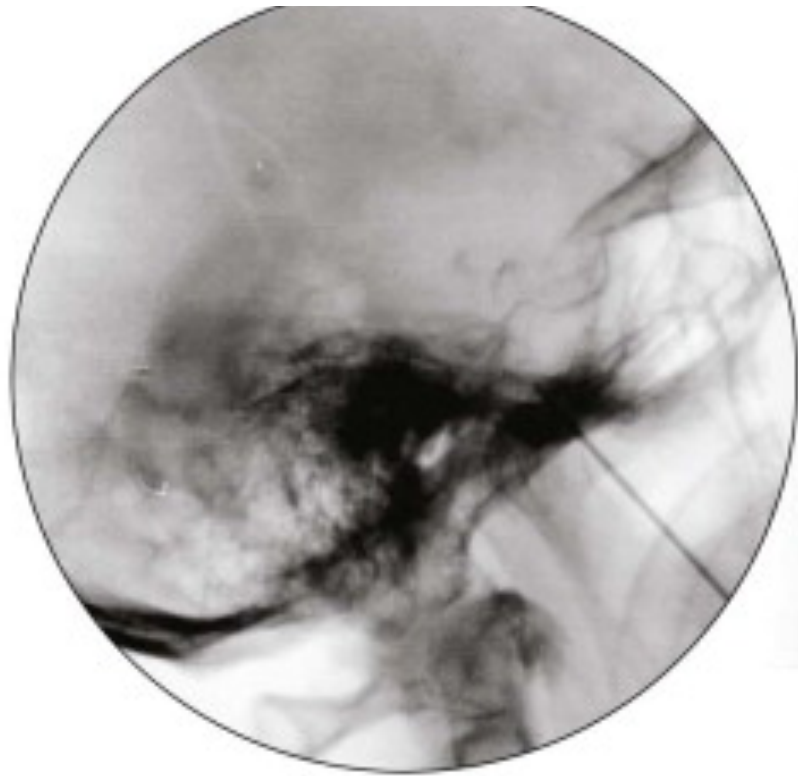
Percutaneous procedures

- Radiofrequency ablation
- Glycerol
- Balloon rhizotomy
- Indications
 - failed medical management and unfit for MVD or refuse
 - MS
 - failed MVD

General considerations

- Atropine to decrease secretion or pacemaker strapped to chest in case of vasovagal bradycardia
- Short acting anaesthetic: propofol with opioid analgesia
- Head extended 30 deg
- Fluoroscopy





Lesioning

- RF: wake pt, test stim to locate correct division, then heat electrode 75-80 deg for 90 sec
- Highest rate of relief amongst percutaneous techniques
- Glycerol: confirm trigeminal cistern by CSF flow, perform cisternogram, then either fill cistern with glycerol or selectively lesion by mixing with contrast (glycerol floats)
- Must stay in contact for 1-2 hrs
- Balloon rhizotomy: ?avoid damage to small unmyelinated corneal reflex fibres ?relieves dural compression at petrous apex
- 4 Fogarty balloon inflated at 1/3-1.5ATM for 1-1.5 min (longer for re-do)

Complications

- Corneal hypoaesthesia 16%
- Sensory loss
- Permanent motor weakness (3% in balloon)
- Dysaesthesia (7%)
- Stroke, haemorrhage, pseudomeningocele, diplopia, hearing loss, facial weakness
- 50% recurrence at 5 years

Radiosurgery

- Mechanism: axonal degeraration as a result of radiation, ?arterioral thickening of conflict vessel
- Old age, poor medical state, anticoagulation, refuse other Rx
- Most common target: root entry zone
- 60-90Gy
- 83% pain relief at 1 yr decreasing to 55% at 5 yrs

Glossopharyngeal neuralgia

- sharp severe pain in the throat or neck, sometimes radiating to or from the upper neck or ear
- Bilateral
- ? PICA compression
- Vagal involvement can lead to bradycardia, syncope, and even asystole
- common triggers include cold beverages, yawning, chewing, coughing, sneezing, and touching the tragus
- Rx: glossopharyngeal nerve and the upper few fascicles of the vagus nerve are sectioned
- Cx: Dysphagia, permanent diminished gag reflex and vocal cord paralysis