Trigeminal Neuralgia & Other Algies of the Face

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Disclosure

I have nothing to disclose
Case I

- 53 year old female patient, c/o R facial pain for the last 2 yrs. Sudden onset, severe, exaggerated by chewing, swallowing and teeth brushing. Seen by dentist who extracted all her wisdom teeth, and referred her to you.
- What is your management approach?
Trigeminal neuralgia

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History

• John Fothergill was first to describe TN, in 1773 (Medical Society of London entitled “Of a Painful Affliction of the Face.”

• 14 pts, most elderly women.

• Brief and sudden bouts of sharp, excruciating pain, triggered by light touch or eating.

Trigeminal neuralgia

- Recurrent brief episodes of unilateral electric shock-like pains,
- Abrupt in onset and termination,
- Distribution of one or more divisions of the fifth cranial
- Triggered by innocuous stimuli.
Distribution of the trigeminal nerve (cranial nerve V)

Key
- Ophthalmic nerve (CN V₁)
- Maxillary nerve (CN V₂)
- Mandibular nerve (CN V₃)

Motor root of CnV
Sensory root of CnV

Sensory root
Trigeminal ganglion
Ophthalmic nerve (CN V₁)
Frontal nerve
Lacrimal nerve
Nasociliary nerve
Maxillary nerve (CN V₂)
Zygomatic nerve
Infraorbital nerve
Anterior superior alveolar nerve
Middle superior alveolar nerve
Posterior superior alveolar nerve
Mandibular nerve (CN V₃)
Auriculotemporal nerve
Buccal nerve
Lingual nerve
Inferior alveolar nerve
ANATOMY

- TN is the sensory supply to face, and sensory and motor supply to the muscles of mastication. It has three major divisions:
  - Ophthalmic (V1)
  - Maxillary (V2)
  - Mandibular (V3)
- The nerve starts at the midlateral surface of the pons, and its sensory ganglion (gasserian ganglion) resides in Meckel's cave in the floor of the middle cranial fossa.
TN is a rare condition that affects women > men.
The annual incidence of TN is 4 -13 /100,000 people.
The incidence increases gradually with age; most idiopathic cases begin after age 50, although onset may occur in the second and third decades or, rarely, in children.
Male to female prevalence ratio: 1:1.5 - 1:1.7 (increased longevity of women).
Rare familial cases have been reported.
HTN may be a risk factor for TN, migraine is a risk factor for TN.

See references in next slide
References

ETIOLOGY AND PATHOGENESIS

- Mainly compression of nerve root, usually within a few mm of entry into the pons (root entry zone).
- Compression by an aberrant loop of artery or vein in 80 - 90 %. Idiopathic TN (classic TN).
- Other causes of TN via nerve compression include vestibular schwannoma (acoustic neuroma), meningioma, epidermoid or other cyst, or, rarely, a saccular aneurysm or a-v malformation.
- Compression of the nerve => demyelination => ectopic impulse generation (ephaptic transmission = Ephaptic cross-talk between fibers mediating light touch.
- Evidence for central pain mechanisms: presence of refractory periods after a triggered episode, trains of painful sensations after a single stimulus, and latency from the time of stimulation to the onset of pain.
- Electrophysiologic evidence of central sensitization of trigeminal nociceptive processing has been observed in patients with atypical TN who have concomitant chronic facial pain.
- Demyelination of one or more of TN nuclei may be caused by MS or other lesions of the brainstem. In MS, a plaque of demyelination typically occurs in the root entry zone of TN, although vascular compression has been noted.

See references in next slide
References

Classification

- Painful trigeminal neuropathy caused by lesions other than vascular compression:
  - Painful trigeminal neuropathy attributed to acute herpes zoster
  - Postherpetic trigeminal neuropathy
  - Painful posttraumatic trigeminal neuropathy
  - Painful trigeminal neuropathy attributed to multiple sclerosis plaque
  - Painful trigeminal neuropathy attributed to space-occupying lesion
  - Painful trigeminal neuropathy attributed to other disorder

ICHD-3 classification scheme for painful trigeminal neuropathy is problematic.

In practice good number of pts with symptoms identical to classic TN and with normal neurologic examinations turn out to have MS or a tumor.

Furthermore, such pts often respond well to the same drugs used for classic TN.

Paroxysmal, stereotyped attacks of usually intense, sharp, superficial, or stabbing pain in distribution of one or more branches of V cranial nerve, maximal at or near onset, might be associated with muscle spasms (tic douloureux).

It is electric, shock-like, or stabbing. Lasts from one to several seconds, but may occur repetitively. A refractory period of several minutes during which a paroxysm cannot be provoked is common.

Some pts with longstanding TN may have continuous dull pain that is present between paroxysms of pain.

Typically does not awaken patients at night.

Typically unilateral. Occasionally bilateral.

Involves V2 and/or V3 subdivisions.

Autonomic symptoms, usually mild or moderate, V1, including lacrimation, conjunctival injection, and rhinorrhea (<5 % of pts).

When prominent or severe: ? syndromes of short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing (SUNCT) and short-lasting unilateral neuralgiform headache attacks with autonomic symptoms (SUNA).

Trigger zones in distribution of affected nerve may present and are often located near midline. Light touch often triggers an attack. Other triggers: chewing, talking, brushing teeth, cold air, smiling, and/or grimacing.

"Pretrigeminal neuralgia," a dull, continuous, aching pain in the jaw that evolves over time into TN (dental origin, and unnecessary dental procedures have been performed), TN can be precipitated by dental procedures (eg, dental extraction).
Cutaneous innervation of the head and neck

Greater occipital nerve (C2)
Lesser occipital nerve (C2, C3)
Great auricular nerve (C2, C3)
C3
C4
C5
Anterior cutaneous nerve of the neck (C2, C3)
Supraclavicular nerves (C3, C4)
V1
V2
V3
References

DIAGNOSIS

- Clinical features
- Search for secondary causes
- Neuroimaging of the brain (CT, MRI with and without contrast).
- Pts with trigeminal sensory loss or bilateral involvement, younger age pts are probably at higher risk of 2ry TN.
- Electrophysiologic testing does not distinguish classic TN from 2ry TN and has no role in diagnostic evaluation of TN.
- In 2008 guideline suggested that trigeminal reflex testing is probably useful for distinguishing classic TN from 2ry TN while trigeminal evoked potentials were not useful for making this distinction.

Evaluation of suspected trigeminal neuralgia

- Recurrent attacks of pain in one or more divisions of the trigeminal nerve, with no radiation beyond the trigeminal distribution
  - Unknown cause
  - Acute herpes zoster or postherpetic pain in trigeminal distribution
  - Trauma (mechanical, chemical, thermal, or radiation-induced) involving the trigeminal nerve in preceding three to six months

- Unilateral symptoms and age 40 years or older
  - Lower risk of secondary TN (painful trigeminal neuropathy)
    - MRI brain
      - Normal MRI
        - Vascular compression of trigeminal nerve
          - Classic TN
      - Abnormal MRI
        - Multiple sclerosis plaque
        - Space occupying lesion
          - Secondary TN (painful trigeminal neuropathy)
  - Bilateral symptoms or age less than 40 years
    - Higher risk of secondary TN (painful trigeminal neuropathy)
    - History of multiple sclerosis
      - Sensory loss (hypoaesthesia or hypalgesia) in affected trigeminal region
Diagnostic criteria

- A) At least 3 attacks of unilateral facial pain fulfilling criteria B and C
- B) Occurring in one or more divisions of TN, with no radiation beyond trigeminal distribution
- C) Pain has at least 3 of the following four characteristics:
  - Recurring in paroxysmal attacks lasting from a fraction of a second to two min
  - Severe intensity
  - Electric shock-like, shooting, stabbing, or sharp in quality
  - At least 3 attacks precipitated by innocuous stimuli to affected side of the face (some attacks, spontaneous)
- D) No clinically evident neurologic deficit
- E) Not better accounted for by another ICHD-3 diagnosis

- Occasional pts have persistent facial pain of moderate intensity in affected area, atypical TN or TN type 2.
- Hypoesthesia or hypoalgesia in the affected trigeminal region always indicates axonal damage => a trigeminal neuropathy.
- In contrast, hyperalgesia in painful region should not necessarily lead to a diagnosis of 2ry TN or trigeminal neuropathy because it may reflect increased attention to the painful side

“Off hand, I'd say you're suffering from an arrow through your head, but just to play it safe, I'm ordering a bunch of tests.”
Neuroimaging with head MRI (or CT) is useful to identify pts with structural lesion (tumor in cerebellopontine angle, demyelinating lesions of MS).

MRA may identify vascular compression as etiology of C-TN.

In 2014 meta-analysis of 9 blinded case-control studies:

- Neurovascular contact of TN on MRI/MRA was significantly more frequent with symptomatic nerves compared with asymptomatic nerves (89 vs 36%).
- Accuracy of neurovascular compression on MRI: sensitivity (75 – 95%) and a specificity (26 - 86%).
- Anatomic change (ie, atrophy, distortion, or flattening) of the trigeminal nerve on MRI at the site of vascular contact was significantly more frequent with symptomatic nerves (53 vs 9%). Sensitivity (20 -74 %) & specificity (79 -100 %).


Differential Diagnosis
**DIFFERENTIAL DIAGNOSIS**

- Acute herpes zoster, postherpetic neuralgia, trauma to the trigeminal nerve, demyelination from MS, and compression of TN by a nonvascular space-occupying lesion.
- V1 is most commonly affected PHN.
- Dental causes of pain: pain is usually continuous, intraoral pain that is dull or throbbing, some pts have a phase of "pretrigeminal neuralgia" (jaw or tooth pain) that might mimic dental pain.
- Several uncommon causes of headache and craniofacial pain: short-lasting unilateral neuralgiform headache attacks, cluster-tic syndrome, and primary stabbing headache.

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Short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing (SUNCT) and short-lasting unilateral neuralgiform headache attacks with autonomic symptoms (SUNA):
Sudden brief attacks of severe unilateral head pain in orbital, peri-orbital, or temporal regions, accompanied by ipsilateral cranial autonomic symptoms, triggered by skin contact, stabbing nature of the attacks

Primary stabbing headache:
Transient, sharp jabbing pains that occur at variable locations within trigeminal and cervical dermatomes, last only a few sec and occur at irregular intervals from one to many times each day.
Pharmacologic therapy is the initial treatment of most pts with classic TN.
Interventional therapy is reserved for pts who are refractory to medical therapy.
Carbamazepine is the best studied treatment for classic TN.
A systematic review and practice parameter published in 2008 from AAN and EFNS:
carbamazepine is effective for controlling pain in pts with C-TN (A), oxcarbazepine is probably effective (B), and baclofen, lamotrigine, and pimozide are possibly effective (C).
Limited data and uncertain effectiveness: botulinum toxin injections, clonazepam, gabapentin, phenytoin, tocainide, tizanidine, and valproate.

Carbamazepine

- 4 RCT with a total of 147 pts: effectiveness of carbamazepine (200 - 2400 mg daily).
- A systematic review and practice parameter published in 2008- AAN and EFNS: treatment response was robust, with complete or near complete pain control attained in 58 -100% of pts on carbamazepine, compared with 0- 40% on placebo. NNT <2. However, carbamazepine was sometimes poorly tolerated, with numbers needed to harm for minor and severe adverse events of 3 and 24, respectively.
- Starting dose is 100- 200 mg BID, increased gradually in increments of 200 mg daily as tolerated until sufficient pain relief is attained (maintenance dose 600 -800 mg daily), maximum dose is 1200 mg daily.
- A/E: drowsiness, dizziness, N & V. Leukopenia is not uncommon, but it is usually benign; aplastic anemia is a rare side effect. The HLA-B*15:02 allele is a genetic susceptibility marker in Asians that is associated with an increased risk of developing Stevens-Johnson syndrome and/or toxic epidermal necrolysis.

Oxcarbazepine: 2008 AAN/EFNS practice parameter: several RCT compared oxcarbazepine (600 - 1800 mg daily) with carbamazepine in 178 C-TN pts => both equally effective, with a >50% reduction of attacks achieved by ≥ 88% of pts in both groups

Oxcarbazepine dose: 600 mg daily, given in two doses. The dose can be increased as tolerated in 300 mg increments every third day to a total dose of 1200 to 1800 mg daily. Testing for the HLA-B*15:02 allele in genetically at-risk populations (Asian ancestry) before initiating treatment with oxcarbazepine.

Baclofen: Limited evidence from a small double-blind crossover trial. 40-80 mg daily resulted in a reduction in paroxysms in 7/10 pts, compared to 1/10 on placebo.

Starting dose: 15 mg daily given tid, with gradual titration to a maintenance dose of 50 to 60 mg/day.

Sedation, dizziness, and dyspepsia can occur, slow discontinuation to avoid seizures and hallucinations.


Lamotrigine: Double-blind, placebo-controlled crossover study of 14 TN pts refractory to carbamazepine or phenytoin, adjunct therapy with lamotrigine (400 mg daily) was beneficial.

Similarly, an open-label study found beneficial effect in 11/15 pts on 400 mg dose. Draw back: titrating the dose over many weeks.

In pts who are not taking other anticonvulsants, starting dose 25 mg daily for 2 wks, then increased to 50 mg daily for another 2 wks. Then dose titrated to effect, increasing by 50 mg daily every 1-2 wks.

- Pimozide: a dopamine receptor antagonist, was > carbamazepine in a randomized, double-blind crossover trial of 48 pts with refractory TN. S/E: sedation, arrhythmias, anticholinergic effects, acute extrapyramidal symptoms, and parkinsonism.

- Topical Lidocaine given by intra-oral application was more effective than placebo for pain reduction in 2 wk, randomized cross-over trial of 24pts.

- Tizanidine: appeared to be more effective than placebo in a small 1 wk trial, but pts who continued the drug, developed recurrent attacks 1-3 months.

- Tocainide was as effective as carbamazepine at 2 wks in a cross-over trial of 12 pts.

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- Small open-label studies: benefit with some medications:
  - Phenytoin and intravenous phenytoin
  - Fosphenytoin
  - Valproic acid
  - Gabapentin
  - Pregabalin
  - Clonazepam
  - Topiramate
  - Misoprostol, in patients with TN and MS
  - Morphine, hydromorphone, or oxycodone
Refactory Pain

- Weak data to support botulinum toxin injections.
- Combination therapy with gabapentin, lamotrigine, topiramate, baclofen, or tizanidine. Intravenous infusion of phenytoin, fosphenytoin, or lidocaine may provide analgesia while oral medications are titrated.
- Phenytoin and fosphenytoin (250-1000 mg IV slowly), and lidocaine 100-300 mg/30 min, while monitoring pulse and BP.


Botulinum toxin injections

- A 2014 literature review: 2 small RCT. One assigned 42 pts received either botulinum toxin A injections or placebo (saline) into skin or mucosa in the regions of pain.
- At 12 wks, botulinum toxin group showed significant reductions in mean pain scores and attack frequency compared with the placebo.
- However, small pt numbers and other concerns about the quality of trial limit the strength of these findings.

- Zakrzewska JM. Botulinum toxin for trigeminal neuralgia--do we have the evidence? Cephalalgia 2012; 32:1154.
The major types of procedures are:
- Microvascular decompression
- Ablative procedures, including: Rhizotomy with RF thermocoagulation, mechanical balloon compression, or chemical (glycerol) injection
- Radiosurgery
- Peripheral neurectomy and nerve block
Observational studies.

A systematic review and practice parameter (2008) AAN and EFNS: microvascular decompression, percutaneous procedures on the gasserian ganglion (rhizotomy), and gamma knife radiosurgery are possibly effective treatment of TN.

- Microvascular decompression has a longer duration of pain control than other surgical interventions.
- Microvascular decompression is invasive, ablative procedures are less invasive, but recurrence may be more common. The incidence of facial numbness is higher with rhizotomy procedures than with microvascular decompression or gamma knife radiosurgery.
- A feared complication is painful posttraumatic trigeminal neuropathy (anesthesia dolorosa), a condition characterized by persistent, painful anesthesia or hypesthesia in the denervated region.
- Anesthesia dolorosa most frequently occurs as a complication of rhizotomy > thermocoagulation, but is rarely, if ever, a complication of gamma knife surgery.

Microvascular decompression: is a major neurosurgical procedure that involves craniotomy and the removal of ectatic superior cerebellar artery, away from TN.

2008 AAN/EFNS practice parameter: 5 studies concluded that initial pain relief was attained in 90 % of pts, but pain-free rates declined by 1, 3, and 5 yrs to 80, 75, and 73 %, respectively.

Mortality 0.2 %. However, major adverse events: CSF leaks, infarction, or hematoma, occurred in up to 4% of pts.

The most common complication was aseptic meningitis in 11 % of pts. Long term hearing loss occurred in up to 10 %, and sensory loss 7 %.

Radiofrequency thermocoagulation rhizotomy: lesion by application of heat

Mechanical balloon compression: uses a Fogarty catheter to compress the gasserian ganglion

Chemical (glycerol) rhizolysis: injection of 0.1 to 0.4 mL of glycerol into the trigeminal cistern

2008 AAN/EFNS practice parameter identified: 4 uncontrolled case series; 2 reports RF thermocoagulation, 1 report glycerol rhizolysis, and 1 balloon compression. Initial pain relief was 90% of pts, but declined by 1 yr to 68-85%, by 3 yrs to 54-64%, and by 5 yrs to approximately 50%.

Complications: meningitis, mainly aseptic (0.2%), Mortality is rare. Postop dysesthesia, described as a burning, heavy, or aching feeling, occurs 12%. Longer-term sequelae include trigeminal distribution sensory loss in nearly 50% pts, anesthesia dolorosa in approximately 4%, and corneal numbness with risk of keratitis in 4%.

**Gamma knife radiosurgery**: lesions with focused gamma radiation.

- Therapy is aimed at proximal trigeminal root not gasserian ganglion.
- The aiming of the beams is carried out with a stereotactic frame and MRI. Doses 70 - 90 grays (Gy). The beams cause axonal degeneration and necrosis.
- Pain relief occurs after a lag time ≥ 1 month.
- The 2008 AAN/EFNS practice parameter: 1 RCT and found no important differences. In addition, 3 case series. Complete pain relief at 1 yr was found in up to 69 % of pts, and at 3 yrs in 52 %.
- An earlier systematic review found that approximately 75 % of pts reported complete relief within 3 months, but the proportion decreased to 50 % by 3 yrs.
- New or worsened facial sensory impairment occurred in 9 -37 %, with more bothersome sensory loss or paresthesia found in 6-13 % of pts.

See references in next slide
References

Peripheral neurectomy can be performed on the branches of the trigeminal nerve (supraorbital, infraorbital, alveolar, and lingual nerves).

Neurectomy is accomplished by incision, alcohol injection, RF lesioning, or cryotherapy.

The AAN/EFNS practice parameter noted that the evidence regarding peripheral techniques for the treatment of TN is either negative or inconclusive.
General Complications

- Numbness, hypesthesia, or dysesthesia in the entire trigeminal nerve or in one of its branches (V₁, V₂, V₃)
- Reactivation of a dominant herpes simplex
- Corneal abnormalities such as absence of corneal reflex, ulceration, and keratitis
- Bleeding at the injection site or localized pain
- Intracranial hemorrhage
- Infection
PROGNOSIS

- The course of TN is variable.
- Episodes may last wks or months, followed by pain-free intervals.
- Recurrence is common, and some patients have concomitant persistent background facial pain.
- Most often, TN tends to wax and wane in severity and frequency of pain exacerbations. However, there are no pure natural history studies of TN.
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NEURALGIAS AND PAINFUL CRANIAL NEUROPATHIES

- Neuralgia: occurs in distribution of a particular nerve(s) that otherwise are normal in function,
- Neuropathy: disturbance of function or pathologic change in nerve(s). Neuropathic pain can be caused by a lesion of the central or peripheral somatosensory nervous system.
  - Trigeminal
  - Nervus intermedius
  - Glossopharyngeal
  - Vagus
  - Upper cervical spinal cord roots

Neuralgic pain

- Paroxysmal quality,
- Maximum at onset,
- Described as lancinating, electrical shock-like, or jabbing.
- Might be a single sharp pain or repetitive pains in succession.
- Duration: last a fraction of a sec or endure for several sec.
- Might be followed by a refractory period (pain will not occur).
- Trigger zones (areas that when stimulated provoke an attack).

Detailed History

- Non-paroxysmal types of pain: continuous aching, burning, or throbbing pain.
- Patients only mention severe exacerbations.
- Response to treatment may provide a clue to diagnosis but can also prove misleading.
- “Diagnostic blocks” in the setting of facial pain do not necessarily define the site from which the pain arises because of the overlap of cranial nerves V, VII, IX, X, which converge on the spinal trigeminal nucleus and the tractus solitarius.

Neuropathic pain

- The mechanisms are complex.
- A nerve injury can induce peripheral and central changes that contribute to persistent pain and abnormal sensation (inflamm, nociceptor activation, tissue injury), primary afferent fibers and central structures become sensitized.
- Permanent loss or injury of primary afferent fibers (deafferentation) results in peripheral neuropathic pain, direct damage to central nervous system structures results in central pain.

Trigeminal neuralgia

- Trigeminal neuralgia is one of the most well-defined and common causes of facial pain. The pain of trigeminal neuralgia tends to occur in paroxysms and is maximal at or near onset. The pain has been described as electric shock-like or stabbing.
Case II

- 63 yr old female patient with Hx of pain in L jaw for the last 6 months after the disappearance of skin rash.
- What is the diagnosis? The management?
Painful trigeminal neuropathy

- Defined by head & /or facial pain in the distribution of one or more branches of the trigeminal nerve caused by another disorder and indicative of neural damage.
- Potential causes include acute herpes zoster, postherpetic neuralgia (PHN), trauma, trigeminal trophic syndrome, multiple sclerosis plaque, and space-occupying lesions.
Postherpetic neuralgia

- Defined as pain that persists anywhere from 1 – 6 months after the rash of acute herpes zoster has healed.
- In rare cases, PHN can occur months to years after resolution of the initial event.
Painful post-traumatic trigeminal neuropathy (anesthesia dolorosa)

- Is characterized by unilateral facial or oral pain that occurs after traumatic injury of the trigeminal nerve, accompanied by additional symptoms or signs of trigeminal nerve dysfunction.
- In anesthesia dolorosa, pain is superimposed in an area of the face that either lacks or has impaired sensation.
Diagnostic criteria, require the following:

● Unilateral facial and/or oral pain
● History of an identifiable traumatic event to the trigeminal nerve, with clinically evident positive (hyperalgesia, allodynia) and/or negative (hypoesthesia, hypoalgesia) signs of trigeminal nerve dysfunction
● Evidence of causation demonstrated by both of the following:
  • Pain is located in the distribution of the same trigeminal nerve
  • Pain has developed within 3-6 months of the traumatic event
● Not better accounted for by another ICHD-3 diagnosis

Traumatic event: mechanical, chemical, thermal, or radiation-induced.
Most frequently occurs as a complication of rhizotomy or thermocoagulation done to treat TN.
In case series of pts treated for TN, developed after glycerol rhizotomy in 0 -1.6 % of cases, after RF rhizotomy in 0.8 -2 %, and following percutaneous controlled thermocoagulation in 3 %.
PPTTN more intolerable than the pain from TN.
Treatment:
Tricyclic antidepressants (amitriptyline) as initial line. When TCA are contraindicated or poorly tolerated, gabapentin or pregabalin are preferred alternative choices. For superimposed neuralgiform pain, carbamazepine is often used in clinical practice.

See references, next slide
References

Case III

- 48 yr old male patient with facial skin ulcer on R side of face for last 4 months.

- He c/o of itching, and sensation of foreign body in the eye and nasal obstruction.

- O/E: facial hypoesthesia. Skin ulcer below the eye.

- What is the diagnosis?
Trigeminal trophic syndrome

- Facial skin ulceration and dysesthesia related to damage in TN pathway affecting either peripheral components or its central sensory nuclei.
- The most frequent causes: therapeutic TN ablation and ischemic medullary or pontine stroke; craniofacial surgery, trauma, and herpes zoster infection.
- Most common symptoms: dysesthesia, including itching, tickling, crawling, burning, as well as ocular foreign body and nasal airflow obstruction sensations.
- Facial pain in 50% of pts.
- O/E: facial hypoesthesia or anesthesia. Skin ulceration tends to occur in the distribution of the infraorbital nerve, although it can occur in other trigeminal distributions (self manipulation with rubbing and scratching of the dysesthetic regions).
- No good treatment, gabapentin and carbamazepine are often employed in efforts to control neuropathic symptoms.
- Measures to protect the injured area and promote healing may be beneficial: protective facial prosthetics and dressings, finger nail trimming, use of nocturnal scratch mittens, and behavioral modification.

See references, next slide
References

Cluster-tic syndrome

- A combination of cluster headache with TN. It is characterized by 3 types of pain:
  - One component resembles TN pain (paroxysmal, short lasting, and severe).
  - 2nd component is more like a cluster headache, although of variable length, with autonomic phenomena (lacrimation, tearing).
  - 3rd pain is a mixture of the first two and may be provoked by trigger points or moving the neck.
- Affects pts between 20-70 yrs of age. It may exist in chronic or episodic (remissions and recurrences) forms.
- Treatment of both: cluster headache and TN, is often unsuccessful.
- Microvascular decompression or trigeminal rhizotomy relieves the neuralgia, the cluster-like pain may be lessened and become more responsive to medical therapy.
Case IV

- 63 year old female patient c/o: severe, dozen attacks, stabbing pain involving tonsillar fossa, base of the tongue, and beneath the angle of the jaw.
- Pain initiated by chewing, and touching external auditory canal.
- What is the problem?
Glossopharyngeal neuralgia

- Paroxysmal pain in areas innervated by cranial nerves IX and X.
- Paroxysmal, severe, stabbing pain involving ear, tonsillar fossa, base of the tongue, or beneath the angle of the jaw, in distributions of auricular and pharyngeal branches of vagus nerve as well as of glossopharyngeal nerve.
- Bilateral in 12% of pts.
- Typical triggers: chewing, swallowing, coughing, speaking, yawning, certain tastes, or touching the neck or external auditory canal (rarely the pre- or postauricular areas).
- Pain typically radiates upward from oropharynx toward ear.
- Duration of the severe paroxysms is sec - min, but there may also be a low grade, constant dull background pain.
- Several dozen attacks can occur per day, sometimes awakening the patient from sleep.
- Severe attacks have rarely been associated with bradycardia/asystole resulting in syncope.

Diagnostic criteria (ICHD-3):

- At least three attacks of unilateral pain
- Pain is located in the posterior part of the tongue, tonsillar fossa, pharynx, beneath the angle of the lower jaw and/or in the ear
- Pain has at least three of the following four characteristics:
  - Recurring in paroxysmal attacks lasting from a few sec to two min
  - Severe intensity
  - Shooting, stabbing, or sharp in quality
  - Precipitated by swallowing, coughing, talking, or yawning
- No clinically evident neurological deficit
- Not better accounted for by another ICHD-3 diagnosis

Idiopathic and 2ry forms of GN {2ry to demyelinating lesions, cerebellopontine angle tumor, peritonsillar abscess, carotid aneurysm, and Eagle syndrome (in which cranial nerve IX is compressed laterally against an ossified stylohyoid ligament)}.

- Vascular compression of cranial nerves IX and X can occur at the nerve root entry zone by the vertebral artery or posterior inferior cerebellar artery.

- DDx: nervus intermedius neuralgia.

- Evaluation: through history, especially inquiring about the presence of trigger factors and nocturnal awakening. ENT examination to exclude local disease.

- MRI/MRA: to detect mass lesion or vascular pathology; plain skull films may reveal an ossified stylohyoid ligament (Eagle syndrome).

- Medical therapy of glossopharyngeal neuralgia is essentially the same as for trigeminal neuralgia.

- LA to oropharynx may prove both diagnostic and therapeutic.

- Surgical treatment is considered for pts who fail medical therapy (intracranial sectioning of cranial nerve IX plus the upper three to four rootlets of cranial nerve X at the jugular foramen, or vascular decompression).

See references, next slide


References

Nervus intermedius neuralgia

- Nervus intermedius (facial nerve) neuralgia (geniculate neuralgia or Hunt neuralgia) is a rare disorder characterized by brief paroxysms of pain felt deeply in the auditory canal.
Occipital neuralgia

- Occipital neuralgia: cause of occipital headache. It is described as a paroxysmal jabbing pain in the greater, lesser, and/or third occipital nerve distribution, ± diminished sensation or dysesthesia in the affected area. Tenderness overlying the nerve may be present.

- Third occipital headache is similar to greater occipital neuralgia, but much less common
Headache due to optic neuritis (retrobulbar neuritis) is characterized by pain behind the eye that is secondary to demyelination of the optic nerve with associated central vision impairment.
Headache attributed to ischemic ocular nerve palsy

- Headache caused by ischemic injury of the ipsilateral cranial nerves III, IV, or VI (i.e., headache attributed to ischemic ocular motor nerve palsy), unilateral frontal and/or periorbital pain caused by and associated with other symptoms and signs of ischemic injury of the ocular nerves that control eye movements.

- Most prevalent with ischemic injury to cranial nerve III, regardless of the presence or absence of underlying diabetes.

Tolosa-Hunt syndrome

- Headache due to Tolosa-Hunt syndrome: unilateral orbital pain associated with paresis of one or more of cranial nerves III, IV, or VI caused by a granulomatous inflammation in the cavernous sinus, superior orbital fissure, or orbit.
Paratrigeminal oculosympathetic (Raeder) syndrome

- Constant unilateral burning facial pain with hypesthesia and/or dysesthesia in the distribution of the ophthalmic division of the trigeminal nerve, along with ptosis and miosis.
- Causes: trauma, middle cranial fossa mass lesion, syphilis, and sinusitis, e.g. lesion in the middle cranial fossa can directly compromise trigeminal nerve fibers and cause neuralgic pain or sensory change with ptosis and/or miosis, but no anhidrosis.

Diagnostic criteria (ICHD-3):

- Constant, unilateral headache
- Imaging evidence of underlying disease of either the middle cranial fossa or of the ipsilateral carotid artery
- Evidence of causation demonstrated by both of the following:
  - Headache has developed in temporal relation to the onset of the underlying disorder
  - Headache has either or both of the following features:
    - Localized to the distribution of the ophthalmic division of the trigeminal nerve, with or without spread to the maxillary division
    - Aggravated by eye movement
- Ipsilateral Horner syndrome
- Not better accounted for by another ICHD-3 diagnosis
Recurrent painful ophthalmoplegic neuropathy

- Or Ophthalmoplegic migraine, a rare condition, seen in children and young adults.
- Repeated attacks of paralysis of one or more ocular cranial nerves, typically cranial nerve III, with ipsilateral headache. Headache can develop up to two wks before onset of eye muscle weakness.
- Brain MRI reveals gadolinium enhancement of the cisternal segment of the affected cranial nerve in approximately 75% of pts with a typical clinical presentation, ?? recurrent demyelinating neuropathy.
- In rare cases, oculomotor nerve tumors may mimic recurrent painful ophthalmoplegic neuropathy (no recovery of ophthalmoplegia between attacks).
References

Diagnostic criteria (ICHD-3):

- At least 2 attacks
- Unilateral headache accompanied by ipsilateral paresis of one, two or all three ocular motor nerves
- Orbital, parasellar or posterior fossa lesion has been excluded by appropriate investigation
- Not better accounted for by another ICHD-3 diagnosis
- Limited observational data suggest that treatment with glucocorticoids is beneficial for some patients.
Burning mouth syndrome

- Intraoral burning sensation without medical or dental cause, may be restricted to the tongue, or just tip of tongue, and may be associated with dysesthesia, altered taste, ± a sensation of having a dry mouth.
- Predominantly affects postmenopausal women, and 30-50 % of pts improve spontaneously.
- Cause: trigeminal small-fiber sensory neuropathy, higher number of unoccupied D2 dopamine receptors in the putamen associated with painful clinical conditions.
- Pramipexole, a nonergot dopamine agonist with a high selectivity for dopaminergic D2 receptors.

See references, next slide
References

Diagnostic criteria (ICHD-3):

- Oral pain
- Recurring daily for more than two hours per day for greater than three months
- Pain has both of the following characteristics:
  - Burning quality
  - Felt superficially in the oral mucosa
- Oral mucosa is of normal appearance and clinical examination including sensory testing is normal
- Not better accounted for by another ICHD-3 diagnosis

Rule out oral mucosal diseases, e.g. herpes simplex and aphthous stomatitis, psychiatric disorders, xerostomia (from drugs, connective tissue disease, or age), nutritional deficiencies (vitamin B12, iron, folate, zinc, vitamin B6), and allergic contact stomatitis, candidiasis, diabetes, denture-related pain, thyroid abnormalities, and menopause.

Treating the underlying cause.

TCA, pregablin or gabapentin, clonazepam may be beneficial.

A systematic review of 9 clinical trials identified 3 interventions that demonstrated a reduction in symptoms compared with placebo. These were alpha-lipoic acid (3 trials), clonazepam (1 trial), and cognitive behavioral therapy (1 trial).
References

Persistent idiopathic facial pain

- Or (Atypical facial pain): persistent facial ± oral pain in the absence of a neurologic deficit.

- In a study of Dutch primary care pts, the incidence was 39.5/100,000 person-yrs.

- Most cases were women.

- Minor surgery or mild injury to the face, teeth, or gums may initiate the symptoms; these persist after healing without a clear local cause. The pain is commonly felt in the nasolabial fold or one side of the chin, but can spread to wider areas of the face and neck.

References:
Diagnostic criteria (ICHD-3):

- Facial and/or oral pain
- Recurring daily for more than two hours per day for more than three months
- Pain has both of the following characteristics:
  - Poorly localized, and not following the distribution of a peripheral nerve
  - Dull, aching, or nagging quality
- Clinical neurologic examination is normal
- A dental cause has been excluded by appropriate investigations
Diagnosed by exclusion; potential structural lesions (craniofacial neoplasms or abscesses), sometimes attributed to a psychogenic etiology (depression).

Treatment: TCA (amitriptyline), gabapentin or pregabalin are preferred alternative choices. In one case report, topiramate (titrated to 125 mg two times a day) was beneficial.

Central neuropathic facial pain

- Caused by a lesion or dysfunction in CNS.
- ICHD recognizes two entities:
  - Central neuropathic pain attributed to multiple sclerosis
  - Central post-stroke pain
OTHER CAUSES

- Secondary causes of craniofacial pain include the following conditions:
  - Cancer pain – Cancer is a rare cause of facial pain. Extracranial bony or soft tissue metastases may impinge upon cranial and upper cervical nerves causing headache or facial pain. In addition, occult lung neoplasms may cause referred pain in the periauricular region.
  - Dental pain – Dental pathology is a common cause of facial pain. The presence of provocative factors such as chewing or heat or cold sensitivity may provide useful clues. TN has been associated with ipsilateral dental pathology.
  - Temporomandibular joint syndrome (TMJ): chr or acute musculoskeletal pain with dysfunction of the masticatory system. The typical headache associated with TMJ syndrome presents as unilateral ear or preauricular pain that radiates to the jaw, temple, or neck. The pain is deep, dull, continuous, and usually worse in the morning.

Giant cell arteritis (GCA): is a chr vasculitis of large and medium sized vessels. The most feared complication of GCA, visual loss. The head pain tends to be located over temporal areas but can be frontal or occipital, mild or severe. Nearly one-half of GCA pts suffer from jaw claudication. In some cases, a trismus-like symptom occurs rather than fatigue of the chewing muscles. Tender temporal or occipital arteries are found in 30% of pts.

- Carotidynia: attributed to noninflammatory lesions affecting the cervical carotid or vertebral arteries. 2ry to arterial dissection, postendarterectomy headache, and headache attributed to carotid or vertebral angioplasty.
Post-traumatic and postoperative pain: occur after trauma (bullet wounds or other head injuries) and maxillofacial surgery, orbital enucleations, sinus, and dental procedures. Manifest constant burning pain, occasionally with tingling and stabbing but without trophic changes, edema, and redness. Blockade of stellate ganglion may be effective in patients who complain of significant burning pain. Amitriptyline, and agents useful for treating migraine headaches.