Headache and the Diagnosis and Management

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PAIN is Subjective and Highly Variable

• Ocular structures and CN VI
  - Ophthalmic nerve supplies most of scalp, upper eyelid, lacrimal gland, cornea

• Not “Brain Pain”

• CN V, VII, IX, X, C-2 and C-3

• Red Flags
  - Worst Headache of a person’s life
  - Neurological Symptoms (slurred speech, weakness)
  - Fever/Stiff neck
  - Temple and Scalp pain
  - Worsening headaches that wake you up
Location, Location, Location

- Ocular Pain
  - CN VI
- Surrounding structures
  - Soft tissues, Muscles, Sinus, Vessels
- “Brain”
  - Dura, Blood Vessels
- Jaw/Dental
- Other
  - Cervical spine, neck
Ocular Conditions with Headache

- “Itis”
  - Episcleritis, Scleritis, Uveitis, Optic Neuritis
- Elevated IOP
- Giant Cell Arteritis
- Corneal pain and inflammation
  - Abrasion, Ulcer, Keratitis
- The pupil and headache
Ocular Inflammation

- Episcleritis
- Scleritis
  - Anterior and Posterior Scleritis
- Uveitis
- Optic Neuritis

- A, D Nodular  B, C, Necrotizing  E. Posterior scleritis.  +APD
## Episcleritis and Scleritis

<table>
<thead>
<tr>
<th>Mild inflammation, superficial</th>
<th>Deeper inflammation, severe pain</th>
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<tbody>
<tr>
<td>Usually isolated</td>
<td>50-70% have underlying disease</td>
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<td>70% female</td>
<td>More commonly female</td>
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<tr>
<td>Conservative treatment</td>
<td>Aggressive Treatment</td>
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<td>Tears, NSAID, possibly a steroid</td>
<td>Over 50% will require systemic therapy</td>
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<td>FML, 0.1% dexamethasone</td>
<td>Oral Prednisone, Immune-modulating drugs</td>
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<tr>
<td>Quick response to treatment</td>
<td>Complications common, especially in necrotizing</td>
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<td>Benign, no complications</td>
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Scleritis

• Lupus, RA, Wegener’s, Ankylosing Spondylitis, Polyarteritis Nodosa, Scleroderma, Sarcoidosis, IBD, Infectious

• Uveitis, Scleral thinning and Perforation, Keratitis, macular edema, retinal and choroidal detachments

• Treatment with Prednisone, MTX, Cyclosporin

  • Treat underlying condition

• Recurrence in 1/3 of patients

• Nodular non-necrotizing anterior scleritis from Nocardia nova infection from mud splash
Elevated Intraocular Pressure

- Acute Angle Closure
  - Severe pain, tearing, blurry vision
  - Corneal edema, fixed mid-dilated pupil, shallow A/C and high IOP
  - Aqueous Suppressants, Osmotic agents, PI, Surgical

- Intermittent Angle Closure
  - Episodes Headache, pain, halos “mid-dilated” state
  - =Early AM, Late PM, cold meds with pseudoephedrine
  - Posner-Schlossman Syndrome
  - Younger, high IOP with subtle uveitis, mild eye ache, slightly blurred vision
  - Treat with steroids, may need short-term IOP lowering agent
Headache: The Cornea

• Corneal density of sensory nerve endings is about 300X that of skin.
  • Ophthalmic branch of trigeminal nerve
• Abrasion, Foreign Body, Ulcer, EKC
• Steroids don’t have a role in acute infection
  • Aid in chronic sterile post infectious inflammation

Herpes Virus

Corneal nerves are de-sensitized due to damage to nerve endings by the virus

Corneal damage more from immune response, rather than direct virus-induced damage

• Chronic pain may linger with inflammation
Optic Neuritis

- Pain or ache in the eye, **worse with eye movements, blurred vision that develops over a few days, muted color vision, especially red tones

- Presenting symptom in 20% of MS patients

- Early intervention with new immunomodulatory agents can delay the onset of clinically definite MS and mitigate the debilitating course of MS to improve long-term prognosis

- DDX: ANION, Sarcoid, Other autoimmune, Syphilis, Toxic or nutritional, compressive

- Goal is to image and refer patient to Neurologist for treatment ASAP
Headache: The Pupil
Red Flag

• Pupil-involving III Nerve palsy = can be painful, with a headache
  --Also have diplopia, ptosis, motility involvement can be variable
  --If Pupil is partially or fully dilated or just sluggishly reactive need MRI urgently
  ---MRI with normal pupil if young patient, incomplete muscle function (may be evolving), >3 months with no improvement, any other neurological involvement, aberrant regeneration

• Horner’s = interruption of ocular sympathetic chain partially or totally
  ***from hypothalamus-down through brain stem to cervical cord-in the apex of the chest-in relation to carotid sheaths--in cavernous sinus or orbit

  • Ptosis, Inverse ptosis lower lid, Miosis and dilation lag

  • Headache/facial/neck pain rule out Carotid Artery Dissection
Giant Cell Arteritis
Suspect it, Treat it Promptly

- Headache, Scalp sensitivity and pain, Jaw claudication, TVO, Shoulder and Hip weakness, Decreased Vision, double vision, fever, weight loss, malaise

- Caucasian, especially Northern European, Women 2-4x more common

- Ocular findings: Arteritic AION most common. Also Posterior ION, CRAO, BRAO

- Check Sedimentation rate and C-reactive protein, consider strongly starting PO steroids while waiting for results, get Biopsy w/in 7-10 days

- Positive results of a temporal artery biopsy = vasculitis characterized by a predominance of mononuclear infiltrates or granulomas, usually with multinucleated giant cells--skip lesions occur

- Treatment tapered after 1-2 months, following symptoms and labs, treating for average 1-2 years to lessen relapses. Low dose ASA decreased risk CVA and VA loss and should be taken if no contraindications.
GCA

- Arteritic Anterior Ischemic Optic Neuropathy with “chalky white” optic disc edema and early cilioretinal artery occlusion

- FA shows evidence of occlusion of the medial posterior ciliary artery and no filling of the cilioretinal artery
Headache around the eye

- SINUS PAIN is usually localized, deep and constant, worsens with sudden movement
  - R/O Tension HA, Treat allergies, decongestants, salt water nasal spray and see PMD
- Pre-septal and orbital cellulitis* can begin with lid infection or extension from a sinus infection or abscess
- Check Pupils, EOM, proptosis, VA and any doubts order CT
- *Orbital septum separates preseptal space from orbit. Orbital septum is a connective tissue extension of periosteum reflected into upper and lower eyelids. It serves as a barrier to spread of infection to the orbit.
Herpes Zoster

• 10-20% have ophthalmic involvement

• Pain described as burning, numbness, hypersensitivity, tingling +/- or itching and precedes rash by a few days, with or without Headache, fatigue and general malaise

• If started within 72 hours of the onset of the acute HZ rash, the oral antiviral agents acyclovir, valacyclovir, and famciclovir significantly shorten the periods of acute pain, virus shedding, rash, acute and late-onset anterior segment complications, and, in the case of valacyclovir and famciclovir, the incidence and severity of post herpetic neuralgia.

• Treatment for long term pain includes tricyclic antidepressants, antiseizure medications, local numbing agents applied to skin and opioids
Trigeminal Neuralgia and Cluster Headache: Severe

- Chronic pain disorder where the trigeminal nerve function is disrupted

  - Contact between a blood vessel and trigeminal nerve at base of brain, pressing on the nerve and over time causing hypersensitivity of the trigeminal nerve nucleus

- Episodes sharp severe pain in cheek, jaw, teeth, forehead and around eye, usually unilateral. When condition first begins these may be mild and non-specific.

- Cluster Headaches have a cyclical pattern, lasting 15 min to 2 hours, several times a day for 6-12 weeks

- Unilateral severe pain in and around eye “ice-pick”, especially at night, theory of decreased blood oxygen as a trigger

- Originate in Hypothalamus, pain largely due to dilated blood vessels creating pressure on the Trigeminal nerve
Migraine and the Eye

- Most common headache disorder that causes ocular pain is really a recurrent CNS disorder

- Throbbing pain, photophobia, nausea and sometimes visual disturbances

  - Aura-- scotomas, hemianopsia, zig-zag patterns, flashing lights, tunnel vision, paraesthesias, vertigo

  - Cortical Spreading Depression = intense depolarization of neuronal and glial membranes causes a cascade of changes

- Usually unilateral, can have temporary neurological symptoms (Migraine Variant= diagnóstis of exclusion)

- Dysfunction or Overactivity of Trigeminal nerve, with “spreading depression” of depolarization across the cortex, especially the occipital lobe

- Blood vessel constriction and dilation accompanies and contributes to the pain
Tension Headache

- Very common—steady pain on both sides of head and forehead, back of head and neck or all areas. Shoulder and neck soreness also.

- Tight or Pressure sensation, as if head were in a vise

- Cause unknown, likely multifactorial: partly muscular strain, combined with environmental factors and abnormal neurotransmitter release

- Worsens with poor sleep, clenching, stress, hormonal changes

- Aggressively treat dry eye, as it can exacerbate and be a stimulus for tension type headaches
Behind the Eye

- **Thyroid Ophthalmopathy** can cause headache behind the eyes, throbbing

  - T cell inflammatory infiltrate, fibroblast proliferation, and widespread deposition of glycosaminoglycans (GAG) in EOM and orbital fat

- **Carotid-Cavernous Sinus Fistulas** - subtle presentation early

  - Mild ache, +/- slight injection, unilateral elevated IOP, mild proptosis
    **Corkscrew-type blood vessels in the conjuntiva in the interpalpebral zone that come up to the limbus**
    **Larger ocular pulse amplitude on applanation tonometry**
    **Patient may hear a pulsatile bruit**
    Later can have diplopia due to ophthalmoparesis, venous congestion in retina

- **Pseudotumor cerebri** -

  - Headache may feel retro-orbital and can waken you from sleep.
    **Blurred vision, TVO, tinnitus, nausea, optic nerve swelling**
    **RF: obesity, BCP, Tetracycline, Excess vitamin A, Growth hormone**
    **MRI and LP**
Orbital Metastasis

- Pain was noted in 23% of cases and may be present early in the course, in contrast to other tumors in which pain is typically a late symptom.

- Compared with other types of orbital neoplasia, metastases have a relatively rapid onset of symptoms. The average duration of symptoms until presentation was 3.6 months: Mets from lung, pancreatic cancer and melanoma a quicker and earlier presentation, whereas metastases from breast and thyroid cancer were characterized by a longer average duration of symptoms before presentation.

- Proptosis and motility disturbances are the most common presenting symptoms and signs along with pain.

- Pain and motility disturbance out of proportion to the degree of proptosis can occur and is somewhat characteristic of an orbital metastasis.
Refractive Headache

• Under corrected Hyperopia or Astigmatism may cause headaches?

• Presbyopic “Eyestrain” and blurred distance vision after prolonged close work

• Rapid change in refraction from Hyperglycemia in Diabetes

• Convergence insufficiency, Headache with reading
  • After cerebral concussion, Adie’s tonic pupil, viral illness,

• Accommodative insufficiency/ Spasm
  • Anticholinergics, antihistamines, tricyclic antidepressants, phenothiazines

• Transient Myopia (hence enhanced accommodation)
  • Toxic reaction to sulfa-derived drugs, tetracycline, compazine, phenergan, diuretics, isoretinon
Case Study

• 61 yo man with 3 day history of headache and periocular pain on the right side

• Very slight blurry vision, slight tearing on the right

• Past ocular and medical history WNL

• Lid/Conj./Cornea/Pupils WNL

• A/C slightly shallow OD, IOP 24, 14

• Pilo 2%, Yag PI, Dexamethasone 0.1% QID
Case study

• Patient returns 2 days later

• Still has headache, ocular pain and blurred vision

• New findings:
  
  • Non-blanching Injection nasally OD
  
  • A/C shallow with patent PI
  
  • IOP 28,15
  
  • Gonio OD Grade 1 Superiorly and Angle Closure Inferiorly
Case Study

- Faint folds in Internal limiting membrane over macula
- Shallow Peripheral Choroidal detachment
- Thickening on B-scan and fluid in Tenon’s space
- Posterior Scleritis with ciliochoroidal effusion and rotation of lens-iris diaphragm anteriorly with shallowing of A/C
- Cyclogyl, Prednisolone gtts, and P.O. Prednisone 1mg/kg