The Osteopathic Approach to Patients with Head Pain

Headache Facts:
- Cost due to lost work per year US: $5-17 Billion
- Twenty million patient visits.
- One year prevalence >50%

Most Common Types of Headaches:
- Tension Headache
- Migraine Headache

Headaches with Musculoskeletal Origin:
- Tension – 2/3 of all headaches
- Migraine with musculoskeletal triggers
- Trigger points (muscle spasms)
- Cervicogenic
- TMJ dysfunction
- Postural strain
- Occipital Neuralgia

Usually have associated somatic dysfunction of head, neck, ribs and/or thoracic regions.

Migraine Headaches - Frontera: Essentials of PMR 2nd Ed. 2008 Chapter 94
- Exact pathophysiology unknown
- Disordered neurogenic control of craniocerebral circulation accompanies attack
- Cerebral, meningeal, basilar, and vertebral arteries may be affected by trigeminal, vagal, and upper cervical nerves which all converge in the trigeminal nucleus caudis in the brainstem

Cervicogenic Headaches- Frontera: Essentials of PMR 2nd Ed. 2008 Chapter 89
- Variant of migraine that originates in the back of the head and spreads to the front
- Pain is unilateral, of moderate severity, and, because it is triggered by neck movement, can be precipitated mechanically
- Occipital Neuralgia is a type of cervicogenic headache
- May be caused by facet joint pain usually secondary to osteoarthritis

Research:

Volunteers who received two HVLA treatments each week for 3 weeks reported significantly less analgesic use, decreased headache intensity and total number of headache hours than a group that had only soft tissue.

No significant differences between combined soft tissue and HVLA and soft tissue alone for the treatment of tension type headaches. However both groups demonstrated a reduction in both headache hours and analgesic use. No change in headache intensity noted in either group.

**Quick Cervical Mechanics Review:**
- **OA** – Position of occiput on C1. Sidebending and rotation occur to opposite sides with flexion or extension
- **AA** – Position of C1 on C2. Rotation primary motion
- **C2-7** - Sidebending and rotation occur to the same side with flexion or extension
- **Cervical translation**
  - Right translation is equal to left sidebending
  - Left translation is equal to right sidebending
  - Right translation restriction is equal to left sidebending restriction
  - Left sidebending restriction is equal to right sidebending preference

**General Physical Exam:**
- Neuro Exam – CNs, DTRs
- HEENT
- Muscle strength
- Flexion, extension, compression of cervical spine
- Special Tests as indicated
- Muscle tension

**Somatic Dysfunction:**
- Upper thoracic, cervical, ribs
- Cranium
- Sacrum
- Posture/leg length

**Posture:**
- Posture affects the levelness of the occipital base and thus alters the muscular balance as well as the cranial mechanism.

- TMJ function
- Occlusion of teeth
- Psychological disposition
OMT for Migraine Headaches

- Aggressive OMT often not tolerated
- Gentle OMT usually tolerated well
- Target
  - Vertebral dysfunction
  - Myofascial dysfunction
- Suboccipital muscles
  - Cranial dysfunction
- Cranial dysfunction can result in dural dysfunction and CNV irritation

Laboratory Exercise

- Diagnosis articular somatic dysfunction
- Treat dysfunction using your favorite OMT technique
  - Head – OA
  - Cervical
  - Thoracic
  - Upper Ribs

Headache Nutrition – See Headache diet

- Dietary triggers
  - Aged cheeses –
    - Cheddar
    - Brie
    - Camembert
  - Cured Meats
  - Chocolate
  - Anything fermented or pickled
    - Sour cream
    - Dill pickles
  - Nuts
  - Breads
  - MSG
  - Beans
  - Caffeine
  - Alcohol
  - Figs, raisins, papayas, avocados, red plums

Tension Headaches- Frontera: Essentials of PMR 2nd Ed. 2008 Chapter 94

- Episodic (>15 days a month) or
- Chronic (<15 days a month)
- Typically bilateral, “band-like”
• Not aggravated by physical activity
• Often overlap with migraines

Musculoskeletal triggers
  – Cervical spine, lumbar, thoracic, sacrum, ribs
  – Myofascial structures
  – Cranial bones
  – Teeth
  – Jaw
  – Sinuses

Research

No significant differences between combined soft tissue and HVLA and soft tissue alone for the treatment of tension type headaches. However both groups demonstrated a reduction in both headache hours and analgesic use. No change in headache intensity noted in either group.

Tension Headaches
• OMT
  – Treat vertebral somatic dysfunction
  – Treat myofascial dysfunction
    – Fascial dysfunction
    – Muscular dysfunction
      – Connective tissue bridge between the spinal dura and the rectus capitis posterior minor muscle. Irritation of dura may result in migraine symptoms
      – Treat tender and/or trigger points
  – Treat cranial dysfunction
    – Cranial dysfunction can result in dural dysfunction and musculature imbalance

Laboratory Exercise:
• Cervical Soft Tissue
  – Kimberly p 40A
• Bilateral Stretching
  – Kimberly p 41C
• Unilateral Stretching
  – Kimberly p 41D
**Suboccipital Muscles**  
Connective tissue bridge between the spinal dura and the rectus capitis posterior minor muscle. Irritation of dura may result in migraine symptoms.

**Occipital Neuralgia**  
Frontera: Essentials of PMR 2nd Ed. 2008 Chapter 89  
Caused by irritation of the Greater Occipital nerve arising from dorsal C2 and 3 nerve roots and the Lesser Occipital nerve arising from the ventral C2 and 3

Pain is generally brief, sharp, and/or lancinating in the distribution of the relevant nerve, usually lasting several seconds. It may also involve a continuous aching or hyperasethesia for days or weeks in the area of the affected nerve. Tenderness to palpation occurs over the greater and/or lesser occipital nerve. Tinel’s sign worsens headache. Resolution of pain after anesthetic block can be used to confirm diagnosis.

**Treatment**
- May need to block nerve prior to OMT  
- Treat cranial and vertebral dysfunction  
- Treat muscular dysfunction
  - The greater occipital nerve travels superiorly between the rectus capitis posterior minor and semispinalis muscles before it pierces through the semispinalis muscle

**Sphenobasilar Strain Pattern Review**
SBS strain patterns are named for the position of the sphenoid on the occiput.

**SBS Torsions**
The paired bones around the cephalad great wing are in relative **external rotation**—may have wide orbit and/or prominent eyeball.

The paired bones around the caudal occiput are in relative **external rotation**.

**Motion Testing - Left SBS Torsion**
Using the classic vault hold:
- Left hand will feel to rotate posteriorly.
- Left index finger moves superiorly  
- Left fifth digit moves inferiorly—occiput moving caudad
- Other hand feels the opposite
Occipital dysfunction may maintain or be maintained by OA dysfunction.

**Sidebending/Rotation**
- Results from a traumatic force to the side of the head at the level of the SBS.
- Results in opposite rotation of the sphenoid and occiput around vertical axes and rotation in the same direction around an AP axis.

One side of head is convex
Paired bones on the convex side –
- Anterior – internal rotation
- Posterior - external rotation

Using the classic vault hold: Right Sidebending/Rotation
- Right hand will feel fuller/wider, but more caudal– fingers will be spread farther apart.
- Other hand feels the opposite
Vertical Strains
- Results from a traumatic force to the inferior aspect of the occiput or superior aspect of the sphenoid.
- Results in rotation in the same direction around respective transverse axes or a shear.
- Named for the relative position of the basisphenoid
- **The resulting strain pattern is dependent upon the relationship between the force vector to the axis of motion.**

Vertical Strains
- Superior – sphenoid moves in flexion while occiput is in extension
- Inferior – sphenoid moves in extension while occiput is in flexion

Using the classic vault hold: Superior Vertical Strain
- Index fingers move inferiorly (sphenoid base moves superiorly)
- 5th digits move superiorly (occipital base moves inferiorly)

Lateral Strains
- **Lateral Strain = parallelogram head**
- Results from a traumatic force to the side of the head – either anterior or posterior to the SBS.
- Named for the relative position of the basisphenoid

Using the classic vault hold: Right Lateral Strain
- Index fingers move laterally to the right
- 5th digits move laterally to the left

**Right Lateral Strain**
**SBS Compression**
Results from an anterior-posterior compressive force. May result from long term psychological trauma as well.

**Using the classic vault hold: SBS Compression**
- Fingers of both hands approximate
- Flexion-extension cycles limited
- “Bowling ball head”

**Cranial Treatment**
- CV4
- Frontal, parietal lifts
- Temporal balancing
- SBS compression/decompression
- Stacking technique

**Trigeminal Neuralgia** - Frontera: Essentials of PMR 2nd Ed. 2008 Chapter 90
- Pain in the distribution of CNV dermatomes
- Pain is electric shock-like, stabbing, unilateral
- Pain-free between attacks
- Mechanical compression of trigeminal nerve as it leaves pons and travels in subarachnoid space towards Meckel’s cave
- **OMT may benefit by treatment of contributing biomechanical dysfunction**
  - Temporal bones
  - Sphenoid
  - Occiput
  - Maxilla
  - Zygoma
Laboratory Exercise

Suboccipital release
1) Patient is supine
2) With your hands in parallel, curl your fingers into the patient’s suboccipital musculature.
3) Allow the patient’s hand to rest on your fingers until the musculature softens.

Temporal Ear Pull
1) Grasp the ears gently on both sides
2) Apply gentle posterior lateral traction along the axis of rotation of the temporal bones (the petrous ridge) to disengage the temporal bones
3) Maintain traction until a softening or release is felt

CV4 (Compression of the Fourth Ventricle)
1) Patient is supine.
2) Cup your hand to form a V with the thumbs.
3) The patient’s head rests on your thenar eminences without contacting the occipitomastoid sutures. Observe motion.
4) Follow craniosacral extension (occiput narrows) and resist flexion (occiput widens) until the motion become reduced or stops (Still Point).
5) As motion resumes follow flexion out and reassess motion.
**Muscle Trigger Points**

Trigger points from the shoulder, cervical, cranial and face may result in pain referral to the head. The pain may be unilateral and throbbing – mimicking or triggering a migraine headache.

**Cervical Musculature**
- **Sternocleidomastoid**
  - Sternal head refers pain to vertex, orbit, maxilla and occiput
  - Clavicular head refers to frontal bones and ipsilateral ear
- **Posterior cervical musculature**
  - Splenius Cervicis refers pain to the ipsilateral orbit
  - Semispinalis capitis produces a band-like pain pattern around the side of the head
  - Suboccipital muscles refer to a diffuse type pain anteriorly towards the orbit
- **Anterior cervical musculature**
  - Digastric refers to upper SCM and lower teeth (PsuedoSCM pain)

**Craniofacial Muscles – muscle of mastication may be irritated by TMJ dysfunction**
- **Occipitofrontalis** refers pain upward and over the ipsilateral forehead
- **Muscles of mastication**
  - Masseter refers to the eyebrow and mandible
  - Temporals refers to the TMJ area, superior orbit and temporal area
  - Pterygoids
    - Lateral refers to the maxilla and TMJ joint
    - Medial refers to the ear and posterior pharynx

**Shoulder Muscles**
- **Upper Trapezius** refers pain along the posterolateral neck, behind the ear and temple
- **Middle Trapezius** refers pain to the suboccipital area

**Muscle Trigger Point Treatment**
- **OMT**
- **Counterstrain**
- **Myofascial release**
- **Muscle energy**
- **Treat both end of the muscle**
- **Spray and Stretch**
- **Trigger point injection**

**Anterior Cervical Counterstrain**

- AC1 F/E SaRa
- AC2-6 FSaRa
- AC3 ESaRa
- AC7 FStRa
Posterior Cervical Counterstrain
PC1-2    ESaRa
PC1  inion  FStRa
PC3-8    ESaRa

Laboratory Exercise:
Assess and treat for significant anterior and posterior cervical tenderpoints

Other Headache Considerations
• TMJ dysfunction
• Posture
  o Specifically target - Upper Cross Syndrome
  o Leg length

Laboratory Exercise:
Self- stretches
1. Scalenes – sidebend away, then
   i. anterior - slight rotation towards
   ii. medius - head forward in neutral
   iii. posterior - slight rotation away

2. Levator Scapulae - Flexion, sidebend away, rotate away

3. Trapezius/SCM - Flexion, sidebend away, rotate towards
**Laboratory Exercise:**

- Evaluate and Treat for functional leg length discrepancy
  - Standing
    - Iliac crest height
    - Standing flexion test
  - Supine and Prone
    - Medial malleoli
    - Innominate diagnosis
    - Sacral diagnosis
    - Hamstring/Psoas tension
  - Treat dysfunction
  - Recheck
    - Iliac crest height
    - Standing flexion test
    - Medial malleoli

**Headache Treatment Summary:**

Needs to be specific to the type of headache

- General Measures:
  - Avoid triggers – headache diary
  - Good posture
  - Stress avoidance
  - Sleep
  - Headache diary
  - Proper nutrition

- Specific Measures:
  - Rest or ice packs
  - Medication – start or stop as needed

OMT – treatment plan will depend upon the type of headache

**Muscle Trigger points:**

- Treatment:
- OMT
- Spray and Stretch
- Trigger point injection
Case Study
36 yo WF complains of recurrent suboccipital headaches.

Headache is bilateral and dull in character. Occurs at least five evening a week. She takes ibuprofen regularly for the pain and works at a computer all day.

Physical exam reveals excessive muscular tension in the upper thoracic region. Spasms the left trapezius and levator scapulae muscles noted. DTRs 2/4 in upper extremities, muscle strength 5/5 and symmetrical. OA ESIr, C2 ESRr, C7ErsI, T2 FSRI and left rib 2 held in inhalation.

Treatment:
OMT to Head, cervical, thoracic and rib regions. Gradually wean off ibuprofen and switch to Tylenol (Ibuprofen may cause rebound headaches). Move computer screen to directly in front of chair. Stretches for upper thorax and neck to be preformed at work.