Clinical Integration of Osteopathic Manipulative Medicine

Family Medicine / Emergency Medicine: Headaches

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Intro:

Headaches account for 1-4% of all emergency department (ED) visits and are the ninth most common reason for a patient to consult a physician. In the United States alone, over 45 million people experience chronic or recurring headaches. As many as 90 percent of all benign headaches fall under a few categories, including migraine, tension-type, and cluster headache. A female preponderance of migraine exists, 14-17%, compared with 5-6% in males. All ages are susceptible, but most patients are young adults.

• Approximately 60% of headache onset occurs in those older than 20 years.
• Headache onset is unusual in those older than 50 years.
• In elderly patients, the practicing physician should never assume that headache onset is due to benign causes, such as tension-type headaches, until pathologic etiologies are explored.

Both muscular and psychogenic factors are believed to be associated with tension-type headache. A study by Kiran et al indicated that patients with chronic tension headaches for longer than 5 years tend to have lower cortisol levels. This was postulated to be due to hippocampus atrophy resulting from chronic stress, a cause of chronic tension headaches.

Migraine headache is highly prevalent in society, with large migraine-related healthcare expenditures each year in the United States. Approximately 18% of women and 6% of men have migraine in the United States, and the annual direct medical costs for these patients are approximately $100 to $200 greater per patient-year than for the general population. Patients with family history of migraines are at greater risk of experiencing migraines in their life.

Although tension-type headaches are the most common kind of headache, patients with this type of headache rarely seek treatment unless occurrence is daily. Migraine, which affects more than 30 million people in the United States, is the most common headache diagnosis for which patients seek treatment. Migraine is a chronic, often inherited condition involving brain hypersensitivity and a lowered threshold for trigeminal-vascular activation.

Patient presentation:

Pain onset in tension-type headache can have a throbbing quality and is usually more gradual than onset in migraines. Compared with migraines, tension-type headaches are more variable in duration, more constant in quality, and less severe.

IHS diagnostic criteria for tension-type headaches states that 2 of the following characteristics must be present:

• Pressing or tightening (nonpulsatile quality)
• Frontal-occipital location
• Bilateral - Mild/moderate intensity
• Not aggravated by physical activity

Tension-type headache history is as follows:

• Duration of 30 minutes to 7 days
• No nausea or vomiting (anorexia may occur)
• Photophobia and/or phonophobia
• Minimum of 10 previous headache episodes; fewer than 180 days per year with headache to be considered "infrequent"
• Bilateral and occipitonasal or bifrontal pain
• Pain described as "fullness, tightness/squeezing, pressure," or "bandlike/vise-like"
• May occur acutely under emotional distress or intense worry
• Insomnia
• Often present upon rising or shortly thereafter
• Muscular tightness or stiffness in neck, occipital, and frontal regions
• Duration of more than 5 years in 75% of patients with chronic headaches
• Difficulty concentrating
• No prodrome

The physical examination serves mainly to exclude the possibility of other headache causes:

• Vital signs should be normal.
• Normal neurologic examination
• Tenderness may be elicited in the scalp or neck, but no other positive physical exam findings should be noted.
• Pain should not be elicited over temporal arteries or positive trigger zones.
• Some patients with occipital tension headaches may be very tender when upper cervical muscles are palpated.
• Pain associated with neck flexion and stretching of paracervical muscles must be distinguished from nuchal rigidity associated with meningeal irritation.

Typical symptoms of migraine include the following:

• Throbbing or pulsatile headache, with moderate to severe pain that intensifies with movement or physical activity
• Unilateral and localized pain in the frontotemporal and ocular area, but the pain may be felt anywhere around the head or neck
• Pain builds up over a period of 1-2 hours, progressing posteriorly and becoming diffuse
• Headache lasts 4-72 hours
• Nausea (80%) and vomiting (50%), including anorexia and food intolerance, and light-headedness
• Sensitivity to light and sound

Features of migraine aura are as follows:

• May precede or accompany the headache phase or may occur in isolation
• Usually develops over 5-20 minutes and lasts less than 60 minutes
• Most commonly visual but can be sensory, motor, or any combination of these
• Visual symptoms may be positive or negative
• The most common positive visual phenomenon is the scintillating scotoma, an arc or band of absent vision with a shimmering or glittering zigzag border

Physical findings during a migraine headache may include the following:

• Cranial/cervical muscle tenderness
• Horner syndrome (ie, relative miosis with 1-2 mm of ptosis on the same side as the headache)
• Conjunctival injection
• Tachycardia or bradycardia
• Hypertension or hypotension
• Hemisensory or hemiparetic neurologic deficits (ie, complicated migraine)
• Adie-type pupil (ie, poor light reactivity, with near dissociation from light)

Differential diagnosis:

• Brain Abscess
• Encephalitis
• Glaucoma, Acute Angle-Closure
• Headache, Cluster

• Meningitis
• Otitis Media
• Sinusitis
• Stroke, Hemorrhagic
- Stroke, Ischemic
- Subarachnoid Hemorrhage
- Subdural Hematoma
- Temporal Arteritis
- Temporomandibular Joint Syndrome
- Trigeminal Neuralgia
- Cerebral Aneurysms
- Chronic Paroxysmal Hemicrania
- Cluster Headache
- Dissection Syndromes
- Herpes Simplex Encephalitis
- Intracranial Hemorrhage
- Muscle Contraction Tension Headache
- Temporal/Giant Cell Arteritis
- Tolosa-Hunt Syndrome
- Viral Meningitis
- Substance-induced headache
- Head injury
- Headache due to vascular causes
- Headache due to nonvascular intracranial causes
- Headache due to psychiatric disorders

Clinical pearls:

- Most can be diagnosed by adequate history and physical exam. Imaging and laboratory studies are generally not required.\(^1^2\)
- Abnormal neurological findings suggest intracranial pathology.
- Sudden onset, no similar prior headaches, headaches that wake the patient up from sleep, altered mental status or seizure, age greater than 50, headache with exertion, illicit drugs and toxic exposures are all red flags in the history for concerning dangerous etiology.
- If a patient presents with any of these red flags a CT scan and laboratory work may be indicated.\(^1^2\)

OMM integration:

Osteopathic manipulative treatment can be a very important therapeutic modality when properly applied by an experienced provider and is used as an integral part of the multidisciplinary pain rehabilitation program. A common element amongst the various types of headaches is muscle tension and somatic dysfunction in the neck and scalp.\(^3^\) When these muscles spasm ischemia may result leading to a back up of metabolic wastes. The build up of these waste products results in pain. Migraine headaches have been associated with dysfunction in the motion of the temporal bones, resulting in side-bending and rotational patterns.\(^7^\) When there is somatic dysfunction in the cranial bones strains in the dura results. By releasing these strains through osteopathic manipulation the CNS can normalize and neuronal function can return to normal.

Osteopathic manipulative treatment has been shown to be successful when used in conjunction with relaxation exercise. One study conducted by Anderson et al randomly assigned 26 subjects with recurrent tension-type headaches into two groups- one group using only relaxation audio tapes while the other group used relaxation audio tapes plus OMT one a week for three consecutive weeks. It was found that in the experimental group receiving OMT that the number of days headache free significantly improved (P=0.016). They concluded “that the decreased frequency of headaches was directly attributed to the selected osteopathic treatment”\(^2^a\)

In 2011, Ajimsha, M.S did a study on the effectiveness of direct versus indirect myofascial release technique in the management of tension-type headache. Participants were randomly assigned to direct myofascial release, indirect myofascial release, or control groups. Interventions were performed twice a week for a total of twelve weeks. The study found that the number of days with headache per month decreased by 7.1 (2.6) days in the direct myofascial group compared with 6.7 (1.8) days in the IDT-MFR group and 1.6 (0.5) days in the control group, (P < 0.001). They concluded that study provided evidence that indirect/direct myofascial release is more effective for tension headaches.\(^3^a\)

Osteopathic structural examination:

There is no predetermined set of locations to examine when looking for somatic dysfunctions associated with headaches. It is important to be aware of the patient’s entire body, but based on the involvement of the head and neck in the generation of headaches these areas may be more appropriate to focus in on.
- Cranial Vault
- Occipito-atlantal joint
- Atlanto-axial joint
- Cervical Spine
- Upper Thoracic Spine
- Clavicles
- Sternum
- Trapezius
- Scalenes
- Levator scapula
- Thoracic Outlet
- Ribs 1&2
- Scapula
- Tempromandibular joint
- Pelvis
- Sacrum

**Treatment options:**

- Muscle energy
- Craniosacral techniques
- Counterstrain techniques
- Osteopathy in the cranial field
- Myofascial release
- HVLA techniques
- Articulatory techniques to: cervical spine, Thoracic spine levels T1-T4, ilia, sacrum
- CV, Technique
- Venous sinus drainage
- Core link
- Myofascial Release to: ribs 1&2, sternum, clavicles
- Occipital Condyle Decompression
- Muscle Energy to Sternocephaloid
- Suboccipital Release
- PINS technique to: frontalis-occipitalis trigeminal, sphenoid-temporal, trapezius, scalenes

**Related evidence based medicine articles:**


**References:**


11. Schwartz BS, Stewart WF, Simon D, Lipton RB. *Epidemiology of tension-type headache.* JAMA 1998; 279:381
