An Osteopathic Approach to Fibromyalgia & Chronic Pain

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Disclosures

- None
Lecture Objectives:

- Understand the difference between acute and chronic pain.
- Compare and contrast subjective and objective findings in acute and chronic pain.
- Understand the physiology and pathology of nociception and chronic pain.
- Become familiar with fibromyalgia pathology and treatment approach.
- Utilize basic indirect osteopathic techniques to treat fibromyalgia and chronic pain patients.

Pain

- Pain is the most common complaint for which people seek medical attention.
- In 2006, 23% of all medications prescribed were used for pain management.
- In 2010, the national cost of chronic pain ranged from $560 to $635 billion dollars.
Pain

- 2010 value of lost productivity due to pain ranged from $299 to $335 billion.
- Heart disease total cost 2010: $309 billion.
- Cancer total cost 2010: $243 billion.
- Diabetes total cost 2010: $188 billion.
- Pain is often mismanaged by physicians.
- Many medical schools and residency programs are lacking in adequate pain management training.

2010 Most Prescribed Medications 1-5

- **Hydrocodone (Vicodin)**, 131.2 million prescriptions.
- Generic Zocor (simvastatin), 94.1 million
- Lisinopril 87.4 million
- Generic Synthroid (levothyroxine)70.5 million
- Generic Norvasc (amlodipine) 57.2 million
CDC Pain Statistics

- One-fifth of adults 65 years and older said they had experienced pain in the past month that persisted for more than 24 hours.
- Almost three-fifths of adults 65 and older with pain said it had lasted for 1 year or more.
- More than one-quarter of adults interviewed said they had experienced low back pain in the past 3 months.

Governor Ducey Aims To Curb Opioid Addiction With New Executive Order

October 24, 2016
CDC Opioid Guidelines

EFFECTIVELY AND RESPONSIBLY
MANAGE CHRONIC PAIN

GUIDELINE FOR PRESCRIBING
OPIOIDS FOR CHRONIC PAIN

www.cdc.gov

From 1999 to 2014, more than 165,000 people died from overdose related to prescription opioids.
Pain

- Descartes (1596-1650) described pain in three stages: 1. Onset of tissue damage; 2. Movement of a signal up a transmission line; 3. Conscious experience and behavioral response.
- An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.

Acute Pain

- Pain that is associated with a well defined cause with rapid onset, < 6 months.
- This type of pain follows an injury and often resolves with the healing process.
- Treatment often consists of rest, OMT, pain medication, and allowing the body to heal where injury has occurred.
Objective Signs of Acute Pain

- Increased heart rate
- Increased systolic and diastolic blood pressure
- Pupillary dilation
- Increased muscle tension
- Think in terms of the sympathetic nervous system.

Chronic Pain

- An unpleasant sensory and emotional experience that persists after overt tissue healing has occurred, > 3-6 months.
- Objective signs on physical exam are less obvious then the sympathetic imbalance that is seen with acute pain.
Signs & Symptoms of Chronic Pain

- Poor sleep
- Appetite changes
- Decreased libido
- Irritability
- Depression
- Decreased energy

Signs & Symptoms

- Interrupted work schedule
- Marital discord
- Interpersonal relationship problems
- Preoccupation with pain and health function
Subjective Nature

- It is the subjective nature of chronic pain and the lack of overt tangible injury that frustrates both the patient and doctor.
- This often results in adversarial relationships rather than doctor/patient alliances.
- Many physicians will “turf” these patients due to frustration and lack of understanding the syndrome of chronic pain.
Assessment

- People who need medical attention
- People who abuse the medical system
- **HOW DO YOU TELL THE DIFFERENCE?**

Assessment

- Waddell signs aka “non-organic findings”
  - Tenderness of the skin to light pinch over a widespread area
  - Deep tenderness in a non-anatomic distribution
  - Reproduction of back pain by pressing on head while pt standing
  - Reproduction of back pain when rotating shoulders and hips at the same time
  - Inconsistencies in straight leg raising
Assessment

- Waddell signs
  - “Give-way” weakness in widespread and non-anatomic pattern
  - Inconsistent and non-anatomic sensory deficits
  - Overreaction during exam (disproportionate verbalizations, facial expressions, muscle tension, collapsing)

Nociception

- The transmission and perception of pain is termed nociception
- Pain is produced by unpleasant noxious stimuli: heat, cold, pressure, and mechanical injury.
- Receptors throughout the body that respond to pain are nociceptors.
Areas of High Nociceptor Concentration

- Subcutaneous tissue
- Periosteum
- Fascia
- Ligaments
- Joint capsules
- Cornea of the eye

Areas of Low Nociceptor Concentration

- Bone
- Skeletal muscle
- Cartilage
Nociception

- Nociceptors are not stimulated directly by noxious stimuli
- Chemical mediators are released when injury occurs which activate nociceptors
- The following are currently identified mediators that cause pain with intradermal injection: serotonin, substance P, bradykinin, and histamine.

Afferent Neurons

- A fibers: Largest and most rapid conducting.
- B fibers: Intermediate size and speed
- C fibers: Small and slow conducting
- A-delta subtype: Respond to strong stimuli very rapid and localized. A sharp pain such as a finger stick.
Afferent Neurons: C Fibers

- C fibers: Transmit pain much slower then A- fibers.
- C fibers are unmyelinated
- Responsible for dull and prolonged pain

Pain Pathway

- Pain stimuli enters the cord via the dorsal root ganglion and ascends or descends several segments giving off collaterals which are responsible for autonomic and somatic reflexes
- Fibers terminate in the dorsal chord, substantia gelatinosa, and travel via the spinothalamic tract to higher brain centers.
Higher Centers

- Reticular Formation: Sleep?
- Limbic System: Mood and emotion?
- Hypothalamus: Libido and endocrine function?
- Thalamus: Pain Relay Center
- Frontal lobe /cerebral cortex: Motivation and personality?

Perception of Pain

- Melzack and Wall Gate Theory as a pain perception model.
- Dorsal Horn serves as a gate which inhibits or facilitates nerve impulses from peripheral sites to the brain.
- Facilitation of pain at the dorsal horn can result in central sensitization.
- “Hyper excitable volume switch”.
Types of Pain

SOMATIC

VISCERAL

NEUROPATHIC

Pain Type: SOMATIC

- Localized
- Pinprick, stabbing, sharp

Examples:
- Otitis media
- Intramuscular injections
- Extensive abrasion
- Laceration or burn
- Fracture or sprain
Pain Type: VISCERAL

- Generalized
- Ache, pressure, sharp

Examples:
- Colic from SBO
- Appendicitis
- Kidney stone

Pain Type: NEUROPATHIC

- Radiating or specific
- Burning, prickling, tingling electric, shock-like

Examples:
- Limb amputation
- Herpetic neuralgia
- Avulsion neuralgia
- Peripheral neuropathy
Types of Pain - Definitions

- Nociceptive pain – normal pain processing
  - Somatic pain - pain arising from skin, connective tissue, muscle, tendons, ligaments, joint, or bone
  - Visceral pain – pain arising from organs usually due to an obstruction of a hollow viscous (ex. GI tract, pancreatitis)
- Neuropathic pain – abnormal pain processing, results in autonomic dysregulation
  - Central – stroke, amputation
  - Peripheral (polyneuropathy or mononeuropathy) – diabetic neuropathy, traumatic nerve injury

Management of Chronic Pain

- Remember that chronic pain is often subjective and very complex
- Avoid giving up on these patients due to frustration
- OMT: Very powerful and effective at treating primary and secondary dysfunction.
- Multidisciplinary Approach
Management

- Medications: Aspirin, NSAIDS, Opioids in a stepwise manor.
- Surgery: Be conservative.
- Injections and Blocks
- TENS
- Counseling/support groups
- OMM
- Multimodal approach
Clinical Case

- A 43 year old female with a past history of irritable bowel and depression presents with a chief complaint of diffuse muscle aches and stiffness for 4 months duration. The pain is 5/10 and interferes with activity of daily living.
- Pt admits to constant fatigue, waking up unrefreshed, migraine headaches, and increased IBS symptoms associated with intermittent diarrhea followed by constipation.

Clinical Case

- Physical exam reveals multiple areas on the body very tender to palpation. There is no joint swelling or deformity noted.
- Lab work including CBC, CMP, ESR, Rheumatoid factor, ANA, TSH, Vitamin D level are normal.
- Diagnosis of exclusion: Fibromyalgia Syndrome
Fibromyalgia

- Most common rheumatologic syndrome in ambulatory medicine, 2-5% population.
- Over 75% are women between 20-50 years of age.
- Characterized by diffuse aches, stiffness, and fatigue.
- Considered a diagnosis of exclusion.
- Rule out thyroid disease, lupus, rheumatoid arthritis, malignancy, infectious disease, vitamin D deficiency.
- Pain and fatigue are worse with stress, cold, and physical activity.

Diagnosis takes an average of 5 years.
- 33% of patients have a history of a specific illness, stress or injury that initiated onset.
- May also have a past history of physical, emotional or sexual abuse, but not in all cases.
2010 ACR Fibromyalgia Diagnostic Criterion

A patient satisfies diagnostic criteria for fibromyalgia if the following 3 conditions are met:

- Widespread pain index (WPI) ≥7 and symptom severity (SS) scale score ≥5 or WPI 3 - 6 and SS scale score ≥9.
- Symptoms have been present at a similar level for at least 3 months.
- The patient does not have a disorder that would otherwise explain the pain.

WPI

- WPI: note the number areas in which the patient has had pain over the last week. In how many areas has the patient had pain? Score will be between 0 and 19.
- Shoulder girdle, left
- Shoulder girdle, right
- Upper arm, left
- Upper arm, right
- Lower arm, left
- Lower arm, right
- Hip (buttock, trochanter), left
- Hip (buttock, trochanter), right
- Upper leg, left
- Upper leg, right
- Lower leg, left
- Lower leg, right
- Jaw, left
- Jaw, right
- Chin
- Abdomen
- Upper back
- Lower back
- Neck
Symptom Severity Scale Score

- Fatigue
- Waking unrefreshed
- Cognitive symptoms

For each of the 3 symptoms above, indicate the level of severity over the past week using the following scale:
- 0 = no problem
- 1 = slight or mild problems, generally mild or intermittent
- 2 = moderate, considerable problems, often present and at a moderate level
- 3 = severe: pervasive, continuous, life-disturbing problems

Considering somatic symptoms in general, indicate whether the patient has:
- 0 = no symptoms
- 1 = few symptoms
- 2 = a moderate number of symptoms
- 3 = a great deal of symptoms

The SS scale score is the sum of the severity of the 3 symptoms (fatigue, waking unrefreshed, cognitive symptoms) plus the extent (severity) of somatic symptoms in general. The final score is between 0 and 12.

* Somatic symptoms that might be considered: muscle pain, irritable bowel syndrome, fatigue/tiredness, thinking or remembering problem, muscle twitches, headache, pain/cramps in the abdomen, numbness/tingling, dizziness, insomnia, depression, constipation, pain in the upper abdomen, nausea, nervousness, chest pain, blurred vision, fexer, diarrhea, dry mouth, dizziness, Raynaud’s phenomenon, hives/warts, ringing in ears, vomiting, heartburn, oral ulcers, loss of change in taste, seizures, dry eyes, shyness of breath, loss of appetite, rash, sun sensitivity, hearing difficulty, easy bruising, hair loss, frequent urination, loss of taste, pain in the abdomen.

Past ACR 1990 Criterion

- Commonly referred to for past studies.
- Will often see reference to this as a result.
- 11/18 tenderpoints present for greater than 3 months duration.
- Replaced by 2010 criterion since it did not account for fatigue and cognitive dysfunction.
Fibromyalgia

- Cause of fibromyalgia: Proposed theories:
- Considered Central Sensitivity Syndrome
- Associated with abnormal pain processing at the dorsal horn.
- “Hyper excitable volume switch”, lower pain threshold.
- Sleep dysfunction: Greater then 70% of patients have alpha wave intrusion into non-REM delta wave sleep.
- Excess levels of Substance P & Glutamate.
- Low levels of Serotonin & Norepinephrine.
Fibromyalgia Associated Conditions & Syndromes

- Migraine Cephalgia
- Chronic fatigue syndrome
- Irritable bowel syndrome
- Depression
- Restless Leg Syndrome
- TMJ syndrome
- Myofascial pain syndrome
- Interstitial Cystitis

Fibromyalgia

- Treatment of fibromyalgia consists of reassurance/education, gradual exercise, pharmacotherapy and OMT.
- Muscle relaxers such as cyclobenzaprine or TCA’s help with sleep and pain.
- Lyrica, Savella, Cymbalta currently FDA indicated for treatment. These agents help with pain, depression and energy levels.
- Narcotics should be avoided.
- NSAIDS should be avoided, not an inflammatory condition.
Medications

- Strong Evidence: TCA’s - including cyclobenzaprine, SNRI, Anticonvulsants
- Modest Evidence: Dopamine agonists (Mirapex), Gamma hydroxybutyrate (Xyrem), Tramadol, SSRI
- No Evidence: Opioids, corticosteroids, NSAIDS, benzodiazepine

Fibromyalgia

- OMT is very useful with fibromyalgia patients.
- Avoid direct techniques, HVLA.
- Indirect techniques, myofascial release and counterstrain are very effective.
OMT Treatment Concepts: Patient Type

- Chronic pain patients, the elderly and hospitalized patients respond better to indirect techniques.
- Acute neck strains and sprains often treat better with indirect techniques.
- Post acute phase injuries can sometimes begin tolerating direct techniques.

OMT Treatment Concepts: Dosing

- For sicker patients: limit OMT to a few key areas.
- “Less is more”: Medical Student Paradigm
- Allow time for the body to respond to treatment.
- Younger patients can tolerate more frequent treatment intervals vs. geriatric patients.
Myofascial Release

- Myofascial Release is a system of diagnosis and treatment, first described by Andrew Taylor Still and his early students, which engages continual palpatory feedback to achieve release of tension in myofascial tissues.

- Direct MFR:
  Myofascial tissue is loaded with a continuous force toward the restrictive barrier until tissue motion is improved.

- Indirect MFR:
  Myofascial tissue is guided along the path of least resistance away from the restrictive barrier until tissue motion is improved.

Mechanism of Action

- Fascia is capable of changes in length (plasticity and elasticity), with associated changes of energy content (hysteresis). Potential energy is stored and mechanical energy is released during movement/unwinding.

- MFR provides peripheral neuroreflexive alterations in muscle tone and neural facilitation, in part, by its influence on mechanoreceptors.

- The application of MFR allows for connective tissue plastic changes (creep) which are associated with release of energy. This may include heat.

- External forces applied to fascia facilitate restoration of normal structure and function.
Indication & Contraindication

Indications
- MFR is used to treat somatic dysfunctions involving myofascial structures and connective tissues.

Contraindications
Absolute
- Lack of patient consent and/or cooperation

Relative
- Extreme caution should be exercised in patients with fractures, open wounds, acute thermal injury, soft tissue or bony infections, abscesses, deep venous thrombosis (threat of embolism), anticoagulation, disseminated or focal neoplasm, recent post-operative states over the site of proposed treatment (wound dehiscence), and aortic aneurysm.

Principles of Diagnosis
- Passive motion testing for a region, local tissues, or a joint is performed to identify a restrictive barrier and a position of ease with regards to the muscle, fascia, and other connective tissue structures.
Thoracolumbar Release

- **Goal:** To balance the thoracolumbar fascia in its relation to the lumbopelvic, thoracocostal and diaphragmatic mechanics. Release myofascial strain in the thoracolumbar region, and improve musculoskeletal and visceral functioning.
1. With the patient lying prone, patient’s feet should be off the end of the table to minimize lower limb stress in relation to the pelvis and low back.
2. Patient’s head is turned to the most comfortable side. Holding exclusively midline often obscures tight-loose effects at the thoracolumbar junction.
3. Arms are comfortably placed off the side of the table.
4. Physician stands at the side of the patient facing toward patient’s head.
5. Physician places hands at the thoracolumbar junction, covering posterior-inferior rib, trunk rotator and diaphragmatic sites.
6. Hands should be open with the thumbs pointed towards the patient’s head along either side of the spinous processes while the remainder of each hand spreads over the posterior-inferior, costal-diaphragmatic and upper lumbar areas.
7. Identify superficial and/or deep tightness and or loose patterns in all three planes.
8. Physician can either engage all barriers (direct) or go towards position of ease (indirect).
10. Reassess.
Thoracic Outlet Release

- Helps improve thoracic region facial restrictions which will aid in the drainage of lymph from the head and neck.
- Place your hands on the patient’s thoracic inlet with your thumbs contacting the posterior portion of the transverse process of T2 and the head of the 2nd rib.
- Your index fingers should contact the sternoclavicular joint and your middle fingers should contact the 2nd rib.
- Your ring fingers and pinkies should lie between the clavicle and 1st rib.
- The palm of your hand rests on the apex of the thoracic inlet.
- Move the tissues into the direction of the restrictive barrier in all planes of motion. This may be a very small amount of motion.
- Wait for an inherent relaxation/release of the tissues. If the tissues are slow to respond, have the patient take three large breaths and follow the release through the exhalations.
Occipitoatlantal Myofascial Release

- This procedure is for general treatment of somatic dysfunction of the occiput and upper cervical spine.
- It is also useful in turning down hyper-sympathetic tonus associated with chronic pain.

OA Treatment

- Cradle the patient’s head with both of your hands so that the tips of your fingers are at the level of the cervico-occipital junction.
- Allow the weight of the head to rest upon your flexed finger tips.
- Apply a gentle cephalad traction with your hands.
OA Myofascial Release
Levator Scapula Insertion: Superior medial border of scapula

Levator Scapula Muscle
SIDEBEND HEAD TOWARD SIDE OF TENDERPOINT

ABDUCT AND SLIGHTLY FLEX ARM WITH CEPALAD COMPRESSION

HOLD FOR 90 SECONDS AND TRY TO REDUCE HYPERTONICITY BY AT LEAST 70%
MONITOR AT SUPERIOR MEDIAL BORDER OF SCAPULA
APPLY DOWNWARD TRACTION OF ARM ON SIDE OF TENDERPOINT WITH FINE TUNING OF INTERNAL AND EXTERNAL ROTATION.

Sternocleidomastoid & Trapezius Muscle
Sternocleidomastoid Muscle (SCM)

Monitor hypertonic SCM muscle
Flex neck
Sidebend neck towards
Rotate away
Hold for 90 seconds and try to reduce hypertonicity by at least 70%

Treatment position
Upper Trapezius Muscle Pain Patterns

Medial Trapezius Location: Sidebend neck towards and rotate away from hypertonic side.

Lateral Trapezius Location: Sidebend neck toward hypertonic side with 170 degrees of flexion and cephalad traction.
Palpate for upper posterior cervical counterstrain points along the transverse processes of the cervical spine.
Palpate for tenderpoints

Posterior points are treated with extension, sidebending and rotation on the same side of hypertonicity.
“Fold and hold” for 90 seconds.
Myofascial Release of Cranial Region

- Stimulates the sympathetic chain ganglion which helps balance the dysfunctional autonomic tone.
- Patient supine and physician seated at side of table.
- Place the fingertips of both hands under the thoracic region of the patient on the spinous processes. Slowly slide your fingertips laterally pulling the paraspinal muscles (Erector spinae) laterally. This will put you onto the costo-transverse articulations, where the rib meets the vertebra.
- Engage in a gentle anterior motion using the finder pads of your digits.

Rib Raising
Frontal Lift

- Interlace fingers above metopic suture
- Place hypothenar eminences on the lateral angles near the coronal sutures
- Action:
  - Using the fingers as calipers
  - Compress lateral angles medially
  - Disengage (lift) the frontals from the parietals
  - Lift the frontal bone anteriorly to decompress and drain the frontal sinuses and also improve pain associated with tension and migraine headache.
CV 4 Techniques

- Very helpful in chronic pain and fibromyalgia patients that have associated headaches.
- Helps to reduce suboccipital tension, reduce sympathetic tonus and encourage cranial extension.
**Technique:**

**Patient:** Supine  
**Physician:** Seated at head

1. Place one hand in the palm of the other so that the thenar eminences lie uppermost and parallel to each other.
2. Slip hands under the head making sure that you are medial to the occipitomastoid suture area.
3. The thenar eminences provide a cushion for the occiput which should be comfortable for the patient and physician.
4. The fingers are free and not pressing on the neck. The weight of the patient’s head rests on the thenar eminences reducing muscle tension in the suboccipital area while encouraging cranial extension.

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**Osteopathic Medicine**

- Increases patient wellness.
- Improves patient care.
- Distinguishes your practice from others.
- Generates many new patient referrals.
- Can be used to aid in diagnosis.
- Is what we were all trained to practice.
References

- Deyo, RA, Rainvelle, J, Kent, DL. What can the history and physical examination tell us about low back pain? JAMA 1992; 268:760.