An Osteopathic Approach to Soft Tissue Pain Syndromes

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Objectives

• Define types of soft tissue pain syndromes and discuss current diagnostic criteria
• Explain the pathophysiology including the etiology, epidemiology, and risk factors of soft tissue pain syndromes
• Identify measures to prevent progression of soft tissue pain syndromes
• Discuss the clinical manifestations and the physical examination findings of soft tissue pain syndromes
• Describe and administer the osteopathic manipulative treatment approach to treatment of the soft tissue pain syndromes and discuss the treatment goals of the various types of OMT techniques
Soft Tissue Pain

Pain secondary to soft tissue structures
• Macrotrauma – muscle strain/tear or sprain
• Microtrauma – repetitive use injury or overexertion
  • Tender points
  • Trigger points
• Systemic inflammation
• Central or peripheral sensitization

Soft Tissue Pain Syndromes
• Constellation of predictable symptoms associated with chronic soft tissue pain
• Local, regional, generalized pain syndromes
Soft Tissue Pain Syndromes

Localized

• Repetitive mechanical injury

• Overexertion of deconditioned tissue
  • Sprains and strains

Regional

• Segmental facilitation of regionally innervated structures

Generalized

• Central sensitization

• Systemic inflammation

Common trigger point patterns of the cervical region
# Soft Tissue Pain Syndromes

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<th>Regional</th>
<th>Generalized</th>
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<td>Myofascial pain syndrome</td>
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<td>Bursitis (e.g., trochanteric bursitis)</td>
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<td>Referred visceral pain (e.g., angina referred to the left shoulder)</td>
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Myofascial Pain Syndrome

ICD-10 - M79.1 Myofascial pain syndrome (also myalgia)
Myofascial Pain Syndrome

Myofascial pain syndrome is a clinical syndrome that includes a combination of several overlapping trigger-point referral patterns in a myotatic unit.

Myotatic unit refers to a group of muscles that move, stabilize, or retard motion at any joint.
Trigger points

A trigger point is a localized area of tenderness and hyperirritability in the muscle, tendons, ligaments, and/or periosteum and is associated with a characteristic referral pattern.

Trigger Point criteria
• Taut band
• Hypersensitive spot
• Referred pain
Trigger points

Nociceptive sensory overload of the segmental dorsal root ganglion and dorsal horn of the spinal cord

Somatosomatic referral
- Dermatomal
- Sclerotomolal
- Myotomolal
- Radicular
- Autonomic pattern

Segmental Facilitation
Trigger Point

- Chronic or acute tension overload
- Excess acetylcholine release causes continual calcium release
  - Increased activation of muscle fibers
  - Premature muscle fatigue
- Sustained vasoconstriction (sympathetic dysfunction)
  - Reduced oxygen
  - Build up of metabolic wastes
- Release of nociceptive chemicals
- Sensitization of pain fibers
Trigger points

**Active trigger points** actively produce achy referred pain **without** palpation. They are tender and produce greater nociception with pain referral upon palpation.

**Latent trigger points** are asymptomatic until palpated. Upon palpation latent trigger points are tender and produced referred pain.

Piriformis
Myofascial Pain Syndrome

Signs and Symptoms

• Regional symptoms
• Dull achy, poorly localized pain (active trigger points)
• Increased pain after repetitive activities
• Pain relieved with rest
• Trigger points occur equally in men and women

• Depression, fatigue, and sleep disturbances not present

Physical Examination

• Multiple active and latent trigger points
• Reduced range of motion (tight muscles)
• Functional weakness (easily fatigued)
• Muscle/posture imbalance
• Localized elevated sympathetic tone autonomic - piloerection, localized sweating, or regional skin temperature changes attributed to altered blood flow
• Palpation reproduces symptoms
Myofascial Pain Syndrome

Epidemiology

- 20% to 95% of patients presenting with musculoskeletal pain at general medical clinics and pain management centers
- Most common in patient with chronic regional pain complaints
  - Chronic low back pain
  - Chronic jaw pain
  - Chronic tension-type headaches
  - Post-whiplash
- More common in females
Complex Regional Pain Syndrome

IC10
Complex regional pain syndrome I (CRPS I)
G90.5 Complex regional pain syndrome I
G90.50 Complex regional pain syndrome I, unspecified
G90.51 Complex regional pain syndrome I of upper limb
   G90.511 right upper limb
   G90.512 left upper limb
   G90.513 bilateral
   G90.519 unspecified upper limb
G90.52 Complex regional pain syndrome I of lower limb
   G90.521 right lower limb
   G90.522 left lower limb
   G90.523 bilateral
   G90.529 unspecified lower limb
G90.59 Complex regional pain syndrome I of other specified site

Complex regional pain syndrome II (Causalgia or CRPSII)
G56.4 Causalgia of upper limb
G56.40 Causalgia of unspecified upper limb
G56.41 Causalgia of right upper limb
G56.42 Causalgia of left upper limb
G56.43 Causalgia of bilateral upper limbs
G57.7 Causalgia of lower limb
G57.70 Causalgia of unspecified lower limb
G57.71 Causalgia of right lower limb
G57.72 Causalgia of left lower limb
G57.73 Causalgia of bilateral lower limbs
Complex Regional Pain Syndrome

Also known as Reflex sympathetic dystrophy (RSD)

Complex constellation of findings in an extremity:
• Persistent, burning pain
• Usually follows a traumatic event
• Associated with hyperactivity of the sympathetic nervous system
• Redness, pallor, edema (swelling), increased sweating of involved area
• Development of localized osteoporosis

CRPS Type 1
• Follows trauma without known specific nerve injury

CRPS Type 2
• Develops after injury to a specific nerve

Major Causalgia (Causalgia means burning pain)
• RSD with nerve injury

Minor Causalgia
• RSD without nerve injury
Diagnostic Criteria (IASP proposed revised)

Continuing pain that is disproportionate to any inciting event

At least 1 symptom reported in at least 3 of the following categories:
1. Sensory: Hyperesthesia or allodynia
2. Vasomotor: Temperature asymmetry, skin color changes, skin color asymmetry
3. Sudomotor/edema: Edema, sweating changes, or sweating asymmetry
4. Motor/trophic: Decreased range of motion, motor dysfunction (eg, weakness, tremor, dystonia), or trophic changes (eg, hair, nail, skin)

At least 1 sign at time of evaluation in at least 2 of the following categories:
1. Sensory: Evidence of hyperalgesia (to pinprick), allodynia (to light touch, temperature sensation, deep somatic pressure, or joint movement)
2. Vasomotor: Evidence of temperature asymmetry (>1°C), skin color changes or asymmetry
3. Sudomotor/edema: Evidence of edema, sweating changes, or sweating asymmetry
4. Motor/trophic: Evidence of decreased range of motion, motor dysfunction (eg, weakness, tremor, dystonia), or trophic changes (eg, hair, nail, skin)

No other diagnosis better explaining the signs and symptoms
Complex Regional Pain Syndrome

Three Stages

- **Stage One**: Agonizing pain; pitting edema; redness; warmth, but coolness may begin; increased hair and nail growth; hyperhidrosis may begin; osteoporosis begins

- **Stage Two**: Pain, brawny edema, periarticular thickening, cyanosis or pallor, livedo reticularis, coolness, hyperhidrosis, increased osteoporosis, ridged nails

- **Stage Three**: Pallor; dry, cool skin; atrophic soft tissue (dystrophy); contracture; extensive osteoporosis
Complex Regional Pain Syndrome

Symptoms
• History of injury
• Profound disabling burning pain across multiple dermatomes in an extremity
• Swelling
• Color and/or temperature changes
• Characteristic arm position -"RSD posture"

Signs
• Allodynia and hyperesthesia
• Guarding
• Exquisite pain with motion
• Reduced ROM
• Livedo reticularis
• No muscle weakness or neurologic deficit
Complex Regional Pain Syndrome

Primarily clinical diagnosis
• X-ray – osteoporosis (Stage 2-3)
• Bone scan – usually positive
• Early – increased activity
• Late – decreased activity
• Standard blood work is normal
Complex Regional Pain Syndrome

Epidemiology

- Mean age 36-46 years
- Female (60-81%)
- Most common injuries – fractures and sprains

Unclear pathophysiology

- Central sensitization
- Autonomic dysfunction

- Early intervention is key
Fibromyalgia

ICD10
M79.7 Fibromyalgia
(also Fibromyositis, Fibrositis, Myofibrositis)
Fibromyalgia

- Type of generalized myofascial pain syndrome
- Characterized by chronic, widespread soft tissue and musculoskeletal pain
- No evidence of inflammatory causation

1990 Diagnostic Criteria

- Must experience pain
  - Above the waist
  - Below the waist
  - In the axial skeleton
- Tenderness in 11 of 18 tender points on physical examination
- Chronic >3 months
Fibromyalgia

2016 Diagnostic Criteria
To receive a diagnosis of fibromyalgia the following 3 criteria must be met:

1. Widespread pain is present in at least 4 of following body 5 regions
   a. Axial region
   b. Left upper region
   c. Right upper region
   d. Left lower region
   e. Right lower region
2. Symptoms have been present at a similar level for at least 3 months.
3. Wide spread pain index (WPI) ≥7 and symptom severity scale (SSS) ≥5 or WPI of 4–6 and SSS score ≥9.

A diagnosis of fibromyalgia may be made in the presence of other diseases, including chronic musculoskeletal diseases.
Fibromyalgia

Widespread Pain

Widespread pain is present in at least 4 of following body 5 regions:

a. **Axial region** – neck, upper back, lower back, chest, abdomen
b. **Left upper region** - left jaw, left shoulder girdle, left upper arm, left lower arm
c. **Right upper region** – right jaw, right shoulder girdle, right upper arm, right lower arm
d. **Left lower region** – left hip/buttock, left upper leg, left lower leg
e. **Right lower region** – right hip/buttock, right upper leg, right lower leg
Fibromyalgia

Widespread Pain Index

Wide spread pain index (WPI) ≥7

a. WPI is calculated as the sum of the individual pain locations below for a total range of score between 0-19
   a. Axial region – neck, upper back, lower back, chest, abdomen
   b. Left upper region - left jaw, left shoulder girdle, left upper arm, left lower arm
   c. Right upper region – right jaw, right shoulder girdle, right upper arm, right lower arm
   d. Left lower region – left hip/buttock, left upper leg, left lower leg
   e. Right lower region – right hip/buttock, right upper leg, right lower leg
Fibromyalgia

Symptom severity scale
Symptom severity scale (SSS) ≥5 or WPI of 4–6 and SSS score ≥9

SSS is calculated as the sum:
• Severity of the following 3 symptoms (0-9):
  • Fatigue
  • Waking unrefreshed
  • Cognitive symptoms

  0 = No problem
  1 = Mild or intermittent problem
  2 = Moderate problem, often present
  3 = Severe, continuous problem that interferes with life activities

• Number of additional symptoms (0-3): headache, pain or cramps in lower abdomen, and depression

• SSS - total range of score between 0-12
Fibromyalgia

Primary vs Secondary

A diagnosis of fibromyalgia may be made in the presence of other diseases, including chronic musculoskeletal diseases.

Secondary fibromyalgia syndrome may be used when other chronic pain conditions are present.

Primary fibromyalgia syndrome may be used in the absence of co-existing chronic diseases.
Fibromyalgia

Physical examination

- Wide spread tenderness
- Palpation triggers a spinal cord mediated withdrawal response
- Normal joints range of motion and no swelling
- Muscle strength – often poor effort
- Neurological examination - normal
- Abdominal examination - mild tenderness especially in the left lower quadrant and suprapubic areas

Pain associated with physical examination may persist for several days

Tender point locations associated with fibromyalgia
Fibromyalgia

Epidemiology
• Affects an estimated 5 million people in the United States
• 3:1 female to male predominance
• Incidence increases with age
• 12% of women over the age of 60
• Symptoms are associated with significant disability

Risk factors
• Familial predisposition
• Febrile illnesses
• Physical injuries
• Mental health triggers such as post traumatic stress

Unclear pathophysiology
• Central sensitization
• Autonomic dysfunction
Chronic Fatigue Syndrome

ICD-10 R53.82  Chronic fatigue, unspecified
Chronic Fatigue Syndrome

Diagnostic Criteria (2015 Proposed Institute of Medicine)

Three required symptoms are:

1. A substantial reduction or impairment in the ability to engage in pre-illness levels of activity (occupational, educational, social or personal life) that:
   a) lasts for more than 6 months
   b) is accompanied by fatigue that is:
      i. often profound
      ii. of new onset (not life-long)
      iii. not the result of ongoing or unusual excessive exertion
      iv. not substantially alleviated by rest

2. Post-exertional malaise (PEM) – worsening of symptoms after physical, mental or emotional exertion that would not have caused a problem before the illness. PEM often puts the patient in relapse that may last days, weeks, or even longer.

3. Unrefreshing sleep – patients with ME/CFS may not feel better or less tired even after a full night of sleep despite the absence of specific objective sleep alterations.

At least one of the following two additional manifestations must be present:

1. Cognitive impairment – patients have problems with thinking, memory, executive function, and information processing, as well as attention deficit and impaired psychomotor functions. All can be exacerbated by exertion, effort, prolonged upright posture, stress, or time pressure, and may have serious consequences on a patient’s ability to maintain a job or attend school full time.

2. Orthostatic intolerance – patients develop a worsening of symptoms upon assuming and maintaining upright posture as measured by objective heart rate and blood pressure abnormalities during standing, bedside orthostatic vital signs, or head-up tilt testing. Orthostatic symptoms including lightheadedness, fainting, increased fatigue, cognitive worsening, headaches, or nausea are worsened with quiet upright posture (either standing or sitting) during day-to-day life, and are improved (though not necessarily fully resolved) with lying down. Orthostatic intolerance is often the most bothersome manifestation of ME/CFS among adolescents.
Chronic Fatigue Syndrome

Also known as Myalgic Encephalomyelitis
Severe disabling fatigue for > 6 months

Typically accompanied by
1. Postexertional malaise lasting more than 24 hours
2. Poor sleep
3. Impairment in short-term memory or concentration
4. Orthostatic intolerance
5. Sore throat
6. Tender lymph nodes
7. Muscle pains
8. Joint pain in multiple joints without inflammatory signs of swelling or redness
9. Headache – new or worsening
10. Chills and night sweats
11. Allergies and sensitivities
Chronic Fatigue Syndrome

Epidemiology
- Rare - 0.006 to 3.0%
- Peak incidence at 30-55 years
- Women > Men
- Typically high functioning prior to onset

Poorly understood pathophysiology
- Autonomic dysfunction
- Central sensitization
- Immune abnormalities
- No blood markers in commonly used tests

No clear treatment has been proven to shorten the course of the syndrome
Chronic Pain Syndrome

ICD-10 G89.4 Chronic pain syndrome  (Chronic pain associated with psychosocial dysfunction)
Chronic Pain Syndrome

History
- Persistent pain lasting > 3 months past normal healing for an injury
- Widespread pain is inconsistent with original injury
- Pain poorly localized
- Self reported disability
- History of multiple unsuccessful interventions
Chronic Pain Syndrome

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Chronic Pain due to Specific Etiology
Chronic Pain Syndrome

Other Symptoms

• Headaches, muscle aches, and/or joint aches
• Weakness, paresthesias, and sensory loss
• Short-term memory impairment and difficulty with concentrating on tasks
• Anxiety, depression, emotional lability, and sleep disturbances
## Chronic Pain vs Chronic Pain Syndrome

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<th>Symptoms</th>
<th>Chronic Pain</th>
<th>Chronic Pain Syndrome</th>
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<tr>
<td>Pain</td>
<td>Localized</td>
<td>Whole leg pain</td>
</tr>
<tr>
<td>Numbness</td>
<td>Dermatomal</td>
<td>Whole leg</td>
</tr>
<tr>
<td>Weakness</td>
<td>Myotomal</td>
<td>Whole leg giving away</td>
</tr>
<tr>
<td>Time pattern</td>
<td>Varies</td>
<td>Never free of pain</td>
</tr>
<tr>
<td>Response to treatment</td>
<td>Variable benefit</td>
<td>Intolerance of treatments</td>
</tr>
<tr>
<td></td>
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<td>Frequent ER visits</td>
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Source: Frontera: Essentials of Physical Medicine and Rehabilitation, 2015 chapter 97
Chronic Pain Syndrome

Physical Exam

- Exaggerated pain response to palpation
- Difficult to perform complete exam due to patient’s complaint of pain
- Patients will demonstrate frequent pain behaviors
- Tender points where muscles attach to bones
  - Flinch response is delayed (cortical response)
  - True flinch response is immediate (spinal reflex)
- Positive Waddell signs for non-organic pain origin
Chronic Pain Syndrome

Physical Exam

- Tenderness is minimal when distracted
- Positive Waddell signs - indicate psychogenic or non-organic cause of chronic pain (positive ≥ 3 of 5)
- Positive Waddell signs do NOT EXCLUDE organic etiology

Waddell signs:

1. Widespread tenderness and tenderness on light skin palpation
2. Pain with downward pressure on the top of the head or rotating shoulders and pelvis together (simulated rotation)
3. Pain with supine straight leg raise, but no pain on seated straight leg raise or while distracted during repeated supine straight leg raise
4. Non-anatomic sensory changes or muscular weakness – inconsistent with innervation
5. Exaggerated pain response that is not present with same stimulus performed while distracted
# Chronic Pain vs Chronic Pain Syndrome

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<th>Signs</th>
<th>Chronic Pain</th>
<th>Chronic Pain Syndrome</th>
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<tbody>
<tr>
<td>Tenderness</td>
<td>Localized</td>
<td>Superficial, non-anatomical</td>
</tr>
<tr>
<td>Axial loading</td>
<td>No lumbar pain</td>
<td>Lumbar pain</td>
</tr>
<tr>
<td>Straight-leg raise</td>
<td>Limited on distraction</td>
<td>Improves with distraction</td>
</tr>
<tr>
<td>Sensory</td>
<td>Dermatomal</td>
<td>Regional</td>
</tr>
<tr>
<td>Motor</td>
<td>Myotomal</td>
<td>Jerky, give away weakness</td>
</tr>
<tr>
<td>Tenderness</td>
<td>Appropriate pain</td>
<td>Over-reaction</td>
</tr>
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Source: Frontera: Essentials of Physical Medicine and Rehabilitation, 2015 Chapter 97
Chronic Pain Syndrome

Pathophysiology
- Unclear pathophysiology
- Central sensitization
- Somatoform component to etiology
- No definitive diagnostic test
- No successful treatment

Risk Factors
- Female
- Childhood abuse
- Chronic pain as an adolescent
- Personality disorders (borderline, narcissistic)
- Low socioeconomic status
Pathophysiology of Central Sensitization and Chronic Pain
Pathophysiology

**Central sensitization** - abnormal amplification of sensory stimuli in the brain and spinal cord in response to sustained nociceptive input

**Spinal segmental facilitation** – type of central sensitization due to sustained nociceptive input into the spinal cord causing sensitization of the pool of neurons in the dorsal horn ganglia. Low resting membrane thresholds allows for excitation of nociceptive and autonomic neurons at below average thresholds.

No evidence of inflammatory cause using current laboratory testing methodologies.

**Peripheral sensitization** – increased nociception due to peripheral nerve damage resulting in ectopic firing and faulty signal transmission. May lead to segmental facilitation and eventually sensitization in the brain. Examples - diabetic neuropathy and sunburn
Pathophysiology

Central Sensitization

Reduced pressure pain thresholds (PPT)
• Increased activity in somatosensory perception
• Persistent neuronal hyperexcitability
• **Hyperalgesia** (abnormally heightened nociception with painful stimuli)
• **Allodynia** (nociception with nonpainful stimuli)
• Decreased central inhibition of nociception

Some degree of central sensitization is present in all soft tissue pain syndromes
Pathophysiology

Neuroendocrine dysfunction
- Low levels dopamine and serotonin
- Progressive loss of brain gray matter (due to chronic pain)
- Elevated levels of substance P in the CSF (Fibromyalgia)
- Exaggerated adrenocorticotropic hormone response to exercise
- Loss of circadian fluctuations in cortisol
- Estrogen deficiency in women

Loss of grey matter is associated with neuronal death
Central Sensitization

**Associated symptoms:**
- Tension headaches
- Cold intolerance
- Cognitive deficits
- Palpitations
- Chest pain
- Morning stiffness
- Sleep disturbances
- Fatigue
- Overactive bladder
- Depression
- Irritable bowel syndrome
- Chronic daily headaches
- Temporomandibular pain disorder
- Chronic pelvic pain
- Interstitial cystitis
- Chemical hypersensitivity syndrome
Differential Diagnosis

• **Chronic fatigue syndrome** – Persistent fatigue >6 months with impaired memory or concentration, multijoint pain, muscle pain, new headache, post exertional malaise, sore throat, tender cervical or axillary lymph nodes, poor sleep

• **Chronic pain syndrome** – Chronic pain, >3 months, that persists longer than expected healing time after an initial injury. Protracted pain that is out of proportion to the objective pathophysiologic process. Physical exam consistent with non-organic or psychologically based pain

• **Complex regional pain syndrome** – Regional hypersympathetic tone causing edema, temperature changes, abnormal skin blood flow and sudomotor activity, and allodynia or hyperalgesia - disproportionate to original injury

• **Fibromyalgia** - chronic, widespread soft tissue and musculoskeletal pain in 4 of 5 body regions for > 3 months and Wide spread pain index (WPI) ≥7 and symptom severity scale (SSS) ≥5 or WPI of 4–6 and SSS score ≥9. May occur with other disorders

• **Myofascial pain syndrome** – Regional soft tissue pain with trigger points. Restricted ROM and easily fatigued muscles. Resolution of pain with trigger point injections

• No rashes, tumors, abnormal lab work, abnormal imaging studies
Differential Diagnosis

- Anemia
- Anxiety
- Cancer
- Connective tissue disorders (scleroderma)
- Depression
- Hypothyroidism
- Infection (Lyme, HIV, Epstein-Barr)
- Inflammatory arthropathies (lupus, rheumatoid, psoriatic arthritis, polymyalgia rheumatica)
- Medication side effects (statins, fluoroquinolones)
- Multiple sclerosis
- Myopathies (polymyositis)
- Osteoarthritis
- Somatization disorders
- Vitamin deficiency (D, B12)

Changes associated with scleroderma

Classic butterfly rash of systemic lupus erythematosus
Red Flag Symptoms

Beware of certain symptoms

• Extreme fatigue upon entering a hot car – multiple sclerosis
• Weight loss – cancer, HIV
• Fever – cancer, chronic infection
• Rashes – lupus, dermatomyositis, psoriasis
• Inflammatory blood markers – autoimmune inflammatory arthritides
Diagnostic Testing

No gold standard diagnostic test

- Identify coexisting disorders
- All typical lab work is negative without co-existing disorders

- CBC
- Electrolytes
- Liver and renal function
- Thyroid-stimulating hormone
- 25-hydroxy vitamin D
- Vitamin B12
- Iron studies
- Magnesium
- C-reactive protein (CRP)
- Erythrocyte sedimentation rate (ESR)
- Autoimmune antibodies for symptoms suggestive of inflammatory disorders
Treatment of Chronic Pain

OMT, PT, Exercise
Osteopathic Approach to Treatment

Five Osteopathic Treatment Models

- Biomechanical
- Respiratory/Circulatory
- Metabolic/Energetic
- Neurologic
- Behavioral

Treatment models overlap

Treatment Options:
- OMT
- Pharmacology
- Surgery
- Diet
- Exercise
- Sleep
- Other Lifestyle
- Behavioral counseling
- Spiritual counseling
Osteopathic Approach to Treatment

Biomechanical
• Optimize structure and function of the musculoskeletal system to affect the body’s homeostatic mechanisms

Respiratory/Circulatory
• Optimize respiratory and circulatory components of homeostatic responses

Metabolic/Energetic
• Optimizes the body’s biochemical processes, cellular functions, and energy consumption

Neurologic
• Normalizes nervous system function including somatic and autonomic nerves

Behavioral
• Utilizes mental, emotional, and spiritual influencers of health
Treatment

Goal of treatment –
• Reduce the symptoms
• Improve function
• **NOT** eliminate pain

**Multi modal treatment best**
• Patient education
• OMT/Manual medicine
• Lifestyle management
• Wellness counseling
• Behavioral therapy
• Pharmaceutical
Treatment

Lifestyle management

Anti-inflammatory diet
Exercise –
• Large body of supportive evidence
• Start slowly (5 min /day), then gradually increase intensity and duration
• Warn of post-exercise soreness
• Include aerobic activity, stretching, strengthening exercises

Physical therapy for patients who cannot follow exercise prescription

Walking, aquatic aerobics, yoga, tai chi, any light impact exercise
Treatment

Behavioral Approaches
• Patient education about disease process
• Sleep hygiene
• Meditation
• Cognitive behavioral therapy
• Positive reinforcement (poor coping skills)
• Anti-inflammatory diet

Other approaches
• Acupuncture
Pharmaceutical Treatment

Tailored to the individual patient, symptoms, and identifiable causation

Primarily pain symptoms
• **Acetaminophen** (500 mg, one to two tablets TID or QID) Hepatotoxicity at 4g per day or with liver disease or alcohol use

• **Nonsteroidal antiinflammatories (NSAIDs)** ibuprofen (200-800 mg TID) and naproxen (375 to 500 mg BID) may be used in combination with acetaminophen. Can cause GI side effects and decreased renal function. COX-2 (celecoxib) have reduced GI side-effects, expensive and best for patients at risk for GI side effects

• **Gabapentinoids** [gabapentin (Neurontin), pregabalin (Lyrica)] - decrease the sensitivity of nerves by raising the resting threshold for pain fiber depolarization. Side effects include daytime somnolence, dizziness, ataxia, dry mouth, constipation, and edema often result in discontinuation of the medication.
Pharmaceutical Treatment

- **Tramadol** (alone or with acetaminophen) - inhibits serotonin and norepinephrine re-uptake and binds opioid receptors - Side effects including constipation, dizziness, drowsiness, dependency, and itching.

Co-existing depression, anxiety, or sleep disturbance

- **Serotonin-norepinephrine reuptake inhibitors** [(milnacipran and duloxetine) such as milnacipran (Savella), duloxetine (Cymbalta), and venlafaxine (Effexor)] - **first line treatment** - Side effects include nausea, dry mouth, and constipation

- **Tricyclics** - [low-dose amitriptyline (Elavil), cyclobenzaprine (Flexeril)] used primarily of their mild sedating effect to improve sleep - Side effects include drowsiness, dry mouth, dizziness and constipation

- **Selective serotonin reuptake inhibitors (SSRIs)** [citalopram (Celexa), escitalopram (Lexapro), and fluoxetine (Prozac)] - **second-tier** for fibromyalgia due to weaker effect with fibromyalgia related pain and - Side effects include sexual dysfunction, platelet dysfunction, and increased suicidal behavior
Pharmaceutical Treatment

Avoid narcotics with soft tissue pain patients

Opioids:
- **Contribute to central sensitization**
- May worsen mood disorders
- Worsen gastrointestinal dysfunction
Treatments

**Complex Regional Pain Syndrome - Early treatment important**
Wide variety of investigational treatments
- Dimethyl sulfoxide, bisphosphonates, steroids, epidural clonidine, intrathecal baclofen, IV immunoglobulin, and IV lidocaine treatments

Minimally invasive techniques show promise
- Sympathetic block – stellate ganglion
- Intravenous regional block
- Somatic nerve block
- Epidural drug administration
- Intrathecal drug delivery
- Neurostimulation

Stellate ganglion blocks in early-stage CRPS may significantly decrease pain and hasten clinical recovery.
Treatment – OMT

Manual medicine improves symptoms
• Exercise therapies
• Massage
• Chiropractic manipulation
• Osteopathic manipulative medicine

Specific techniques
• Myofascial release
• HVLA
• Soft tissue
• Muscle energy
• Counterstrain
• Cranial osteopathic manipulative medicine

• Mechanisms likely multifactorial
• Improve PPT, physical function, mood, and wellbeing

Studies tend to be small (compared to pharm studies) and methodologically prone to bias (because you cannot double blind)

Both manual and exercise therapies are known to cause post treatment soreness. Educate your patient.
Treatment – OMT

**Lymphatic**
- Assess and treat for fascial imbalance
- Assessing for the Zink’s common compensatory pattern
- Targeting structures out of pattern

**Autonomic**
- Assess and treat for dysfunction that may alter sympathetic or parasympathetic tone

**Biomechanical and Energetic**
- Assess and treat any somatic dysfunction associated pain
- Optimize biomechanical loading
- Assess and treat for postural imbalance
- Decrease energy expenditure associated with poor biomechanics

Common Compensatory Pattern
Treatment of Trigger Points

• **OMT**
  - Counterstrain
  - Myofascial release
  - Soft tissue techniques
  - Percussion hammer

• Vapo-coolant spray
  - Spray and Stretch

• Injection of trigger points

• Dry Needling

• Exercise – Postural retraining

1. Bony misalignments force the arches to lower, shifting the center of gravity inward and forward. This generates imbalances throughout the entire musculoskeletal structure.

2. Hyper-extended knees

3. Whole body leans forward

4. Pelvis tilted forwards, causing buttocks to protrude

5. Protruding abdomen

6. Increased curvature of lower spine

7. Sagging chest and rounded shoulders

8. Increased curvature of upper spine

9. Jaw drops

10. Increased curvature of neck

11. Head tilted forward and downward
Postural Treatment

Visit 1
1. Stretching tight muscles
2. Begin light aerobic activity

Visit 2
1. Reassess
2. Strengthen weak muscles
3. Continue stretching tight muscles

Upper cross syndrome – postural muscular imbalance characterized by tight suboccipital, upper trapezius, pectoralis major and minor, and levator scapula with weak cervical flexors, rhomboid, and lower trapezius.

Lower cross syndrome – postural muscular imbalance characterized by increased pelvic tilt with tight erector spinae, iliopsoas, and rectus femoris and weak gluteus maximus, medius, and abdominal muscles.
Soft Tissue Pain Syndromes

Complications
- Poor quality of life
- Depression
- Disability with limitations of activities of daily living
- CRPS - progression

Prognosis
- Tends to persist for many years
- May worsen in many patients
- Medication compliance is associated with a 30% incidence in improved symptoms
- Indicators of poor prognosis include denial, high levels of psychological stress, and poor social support
Prevention

No known factors that prevent soft tissue pain syndromes

Healthy Lifestyles protect against most disease processes

• Adequate sleep
• Regular exercise
• Stress management
• Healthy diet

All reduce the frequency and severity of soft tissue pain symptoms
Sample Question

A 56-year-old man complains of worsening right arm pain since falling off a ladder 3 months ago. He describes the pain as stinging and burning over the whole arm with a reduced shoulder range of motion. Physical exam is difficult since he guards his arm from being passively moved. Active range of motion is mildly reduced and painful. Sensation is intact but hyperesthesia is present. Skin is moist on the right arm compared to the left. The most likely diagnosis is

A. Malingering
B. Fibromyalgia
C. Complex regional pain syndrome
D. Chronic pain syndrome
E. Cervical radiculopathy
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