Myofascial and SI Pain

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Disclosure

I have no financial relationship with any commercial interest related to the content of this course
I may discuss off label use of medications during my presentation or during Q/A. I will disclose any such reference.

Musculoskeletal disorders

- Diagnosed in 10% of US population
- Main cause of disability in working-age population
- Prevalence:
  - 80-95% of patients in pain clinics
  - 30-50% of patients in general practices
  - 55% of patients in head/neck pain clinics

Janet Travell, MD

- First female US Surgeon General
- Appointed by John F. Kennedy, and treated his myofascial low back pain

Is it real?

- Often misdiagnosed as fibromyalgia
- Underdiagnosed
- Increased cost to patient: repeated medical visits, failed therapies
- Patients labeled as malingerers, neurotic, or high degree of somatization

Chronic Myofascial pain

- Contributes to multiple pain disorders
- Complicates the diagnosis of pain disorders
- Multiple muscles have overlapping referral pattern
- Reportedly 650 to 800 muscles in the body – all capable of trigger point development
Muscle structure/function
- Basic muscle function is the generation of force
- Muscle is either smooth or striated
- Striated is further divided into skeletal and cardiac

Properties of Muscles
- Conductivity (conduct action potential)
- Contractility (contract with stimulation)
- Irritability (react to stimulation)
- Relaxation (return to resting properties)
- Extensibility (Stretch)
- Elasticity (return to original shape)

Muscle Structure
- 85% muscle fiber
- 15% connective tissue
- Connective tissue responsible for force transmission (muscle-bone via tendons)
- Elasticity/extensibility of connective tissue allows smooth transition of tension; return of muscle to original shape after stretch

Muscle structure
- Skeletal muscles are wrapped in connective tissue that folds into the muscle dividing it into bundles of fibers
- Cylindrical fiber bundles called fascicles and traverse the length of the muscle
- Fascicles are composed of bundles of long muscle fibers of threadlike filaments responsible for contraction

Myofascial
- Superficial fascia with multiple locations
- Clear, fibrous connective tissue wrapping the muscle as described
- Plastic – wrap like
- Becomes shorter, condensed and tighter with injury
- Trigger points occur in myofascia, contracture causes nodules under the skin

Muscle function
- Conversion of chemical energy into mechanical energy to produce motion:
  - skeletal system gross movement
  - Fine motor skills (hands)
  - Functional movement of organs (heart, stomach)
- Support posture
- Assist with body temperature maintenance (produce 85 percent of the body’s heat)
Muscle Contraction

- Filaments are organized into sections containing groups of one section of thick filaments in between two sections of thin filaments.
- An action potential is generated (ACH stimulates Ca+ release, etc.)
- Thick filaments structures attach to thin filaments pull them to the center of the thick filament

Muscle Contraction

- The thin filaments slide in between the thick filaments causing a muscle CONTRACTION
- When the stimulus ends (calcium goes back to storage) the structures separate and the muscle RELAXES

Muscle movement

- Connective tissue running through skeletal muscles that create the bundles merge at the ends of the muscle and extend to form tendons
- Tendons anchor muscles to bones
- Muscle contraction causes bones to move at their joints.

Muscle movement

- Muscles work in pairs
- They only contract or pull
- One muscle is a flexor and has a partner that is an extensor
- Muscle partners pull in opposite directions and cause movement

Trigger point overview

- Hyperirritable spots in a very taut band of skeletal muscle
- Pain is local and referred
- Often found in patients with chronic musculoskeletal disorders

Trigger Points

- Can cause mechanical distress on
  - Joints
  - Tendons
  - Nerves
  - Discs
  - Muscles
Trigger Points

- Can cause:
  - Decreased blood flow
  - Increased accumulation of toxins
  - Pain
  - Muscle spasm
  - Stiffness
  - Decreased muscle function/ROM

Causes of Trigger Points

- Direct Stimulation
  - Acute overload
  - Chronic abuse
  - Chronic fatigue
  - Chilling
  - Trauma

- Indirect Stimulation
  - Other trigger points
  - Visceral disease
  - Arthritic joints
  - Emotional distress

Pathology

- Form as a local contraction in a small number of muscle fibers within a larger muscle or muscle bundle
- Thought to pull on tendons and ligaments associated with the muscle
- Can cause pain deep within a joint where there are no muscles

Pathology

- Muscle fibers contract using biochemical energy
- Depletion of the biochemicals leads to accumulation of fatigue toxins such as lactic acid
- Tightened muscle fibers constrict which prevents capillaries from transporting the fatigue toxins for elimination

Presentation

- Accumulation of the fatigue toxins within a muscle bundle or muscle will present upon palpation like a tight muscle band

Trigger Point Overview

- Commonly found in postural muscles—neck, shoulders, back, pelvic girdle
- Includes the upper trapezius, scalene, sternocleidomastoid, levator scapulae, and quadratus lumborum
Trigger Point Overview

- May cause headaches, tinnitus, TMJ pain, eye symptoms, torticollis (cervical myospasm pulling head to one side), decreased ROM (especially legs and low back)

Common Locations

Etiology

- Acute trauma
  - surgical scar
  - sports injury
  - tissues under tension—i.e., after spinal surgery and hip replacement

- Repetitive Microtraumas (stresses muscle fibers)

- Inactivity/immobility
- Prolonged poor posture
- Vitamin deficiencies
- Sleep disturbances
- Joint problems
- Occupational or repetitive muscle stress

Etiology

- Biochemical

- Non-neuronal components – glial cell activation

- Central and peripheral sensitization
Diagnosis

- Palpation (compression) of muscle fiber that is harder than normal
- Involuntary muscle “withdrawal” with palpation known as a positive Jump sign, and elicits a twitch response
- Pain is elicited over affected area or referred in a pattern
- An active trigger point causes pain while the muscle is resting

Active Trigger Point

- Causes pain at rest
- Spot tenderness
- Muscle dysfunction
- Pain with muscle compression
- Always has taut band that increases muscle tension
- Muscle stimulation results in local twitching

Diagnosis

- No definitive diagnosis
- Based on history and clinical exam

Active Trigger Point

- Causes pain at rest
- Spot tenderness
- Muscle dysfunction
- Pain with muscle compression
- Always has taut band that increases muscle tension
- Muscle stimulation results in local twitching

Latent Trigger Point

- No pain at rest
- Pain with palpation
- Always has taut band that increases muscle tension
- May decrease ROM
- May cause muscle weakness

Diagnosis

- No specific lab test or muscle study/biopsy has been developed to diagnose trigger points
- Trigger points cause referred pain characteristic of the specific muscle

Tender points

- Tender points occur with pain at site of palpation only, in insertion of muscle zones and do not refer pain.
- Patients may have both tender points and trigger points
- Patients do not exhibit “positive jump sign”
Referred pain

- Area of referral often very tender and may contain more trigger points
- Active trigger points more painful, latent trigger points may require more compression to identify

Twitch response and Pain recognition

- Transient muscle contractions
- Precise needling of the trigger point
- May not be demonstrated with repeated treatments
- Palpation of spot reproduces pain: patient declares “THAT’s IT!”

Chronic Myofasical Pain

- Reduced ROM due to pain
- Increased muscle weakness
- Muscle fatigues more quickly

Diagnosis Review

- Tight muscle band
- Tender nodule in muscle belly
- Positive jump sign or patient recognition of pain production
- Pain limiting stretch and/or ROM

Muscle Inspection

- Look for muscle symmetry
  - Muscle definition
  - Size
  - Tension
  - Skin folds
  - Evenness of level of shoulders, hips, pelvis, knees, etc.

Palpation

- Flat technique:
  - Use tip of middle finger, lightly glide over painful area
  - Feel for nodule (pea to marble size)
  - Feels like a small nodule under skin if in peripheral muscles, harder to feel in deeper muscle with this technique
**Palpation**

- **Snapping technique**
  - Roll muscle band quickly under fingertips
  - May produce a localized muscle twitch

- **Pincer technique**
  - Pinch over belly of muscle using thumb and other fingers, rolling the muscle fibers back and forth
  - Deeper palpation
  - Hold identified trigger point nodule between fingers for injection

**Trigger Point Myofasical Pain Differential Diagnosis**

- Angina (pectoralis major)
- Sciatica (gluteus minimus)
- Migraine headaches (SCM, temporalis, posterior cervicals)
- Low back pain (lower rectus abdominis)
- TMJ (masseter, pterygoids)
- Rotator cuff tear (supraspinatus)
- Cervical radiculopathy (scalenes, supraspinatus, infraspinatus)

**Documentation**

- **Muscle(s)**
- Reference: Travell and Simon FlipChart

**Treatment Modalities**

- Identification and elimination of cause
- **Physical therapy**
- Massage
- Spray and stretch technique (Fluoromethane or ethyl chloride spray)
- Ultrasound
- Manipulative therapy
- Accupressure
- Heat/ice
- Nerve stimulation
- Dry needling
- Medications
- Injections (local anesthetics, saline, steroid)
- Theracane

**SI Joint Provocation Tests**
### SI Provocation

**Provocative tests for SI pain diagnosis**
- Gaenslen
- FABER / Patrick's test
- Thigh thrust / femoral shear test
- ASIS distraction (supine)
- Sacral compression (lateral)

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### Gaenslen’s Test

Gaenslen's test is performed with the patient supine (on the back). The hip joint is maximally flexed on one side and the opposite hip joint is extended. This maneuver stresses both sacroiliac joints simultaneously. Groin pain is more indicative of hip pathology.

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### Fabers/Patrick’s test

- hip joint or sacrum pathology
- Place the patient in the supine position
- Flex the leg and put the foot of the tested leg on the opposite knee. (the motion is that of Flexion, Abduction, External Rotation at the hip)

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### Faber/Patrick’s

- Slowly press down on the superior aspect of the tested knee joint lowering the leg into further abduction
- The test is positive if there is pain at the hip or sacral joint, or if the leg can not lower to the point of being parallel to the opposite leg

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### Thigh thrust/Femoral Shear

- Applies AP pressure
- Supine with one hip flexed to 90 degrees. Examiner positioned on same side as the flexed leg. Examiner provides either a quick thrust or steadily increasing pressure through the line of the femur
- Stabilize ASIS with other hand

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### SI Provocation Shear Test

- Sacroiliac shear test. With the patient prone, the palm of the examiner's hand is placed over the posterior iliac wing, and an inferiorly directed thrust produces a shearing force across the SIJ.
Compression test

- Lateral position. Downward pressure is applied to the uppermost iliac crest, directed toward the opposite iliac crest to stretch the posterior sacroiliac ligaments and compress the anterior SIJ.
- Applies lateral compression force across the SI

Distraction test/Gapping

- Distraction test (gapping). Supine position. A slow and steadily increasing pressure is placed through the arms and held to stretch the anterior sacroiliac ligaments and synovium posteriorly and laterally.

Validity of SI Provocation

- Laslett et al report that the accuracy of detecting SI joint dysfunction is increased with at least 3 of the 5 tests are positive. If all 5 tests are negative, SI pain can be ruled out.

References

- Yung C. Chen, MD; Michael Fredericon, MD; Matthew Smuck, MD; Sacroiliac Joint Pain Syndrome in Active Patients - A Look Behind the Pain; The Physician and Sports Medicine - VOL 30 - NO. 11 - NOVEMBER 2002.
- Laslett M, April CN, McDonald B. Provocation sacroiliac joint tests have validity in the diagnosis of sacroiliac joint pain. Archives for physical medicine and rehabilitation 2006 Jun;87(6):874-5.

References


Hands - on

Pick a partner and let’s practice!