

## **Fibromyalgia**

*Fibromyalgia is a common cause of chronic musculoskeletal pain. It is one of a group of soft tissue pain disorders that affect muscles and soft tissues such as tendons and ligaments. None of these conditions is associated with tissue inflammation and the etiology of the pain is not known.*

### **ANESTHETIC CONSIDERATIONS:**

- Rule out other inflammatory or endocrine disorders before making a diagnosis of fibromyalgia
- Medications patient may be on: analgesics, antidepressants, anticonvulsants, possibility for high opioid dependence although opioids are not a suggested treatment for fibromyalgia

### **ANESTHETIC GOALS:**

- Higher pain sensitivity therefore optimize pain control for surgery
- Goal is to improve everyday functioning

### **HISTORY**

- Characteristics of fibromyalgia:
  - Widespread musculoskeletal pain (involves both sides of the body and above and below the waist) for >3 months
  - Pain may initially be localized, often in the neck and shoulders
  - Pain is typically predominant throughout the muscles, but may have pain in their joints
  - May have associated paresthesias, including numbness, tingling, burning, or creeping or crawling sensations, especially in both arms and both legs
  - Cognitive problems with attention and difficulty doing tasks that require rapid thought changes
  - Associated mood disturbances – depression, anxiety
  - Fatigue and poor sleep with frequent wakings
  - Migraine or tension headaches

### **PHYSICAL**

- Allodynia to digital pressure at 11 or more of 18 anatomically defined tender points:
  - Bilateral occiput, at the suboccipital muscle insertion
  - Bilateral low cervical, at anterior aspect of intertransverse spaces between C5 and C7
  - Bilateral trapezius, at midpoint of the upper border
  - Bilateral supraspinatus, at its origin above scapular spine near the border
  - Bilateral second rib, just lateral to the costochondral junctions on upper surface
  - Bilateral lateral epicondyle, 2 cm distal to the epicondyle
  - Bilateral glutei, at the upper outer quadrant of the buttock
  - Bilateral greater trochanter, posterior to the trochanter
  - Bilateral knee, medial fat pad proximal to the joint line
- The anatomic location of the tenderness at the fibromyalgia syndrome tender points is deep to the skin in a variety of soft-tissue structures such as skeletal muscles, ligaments, and bursae
- Autonomic nervous system dysfunction – orthostatic hypotension

### **INVESTIGATIONS**

- There is no diagnostic laboratory test, or radiographic or pathologic finding, and testing should be kept to a minimum
- Any testing is done primarily to exclude an associated disease or another illness that may mimic FM (thyroid function tests, rheumatoid factor, look for elevations in acute phase reactants: plts, ESR, CRP)

### **TREATMENT**

- The objectives of fibromyalgia syndrome treatment are to reduce pain, improve sleep, restore physical function, maintain social interaction, and re-establish emotional balance
- To achieve these goals, patients need a combination of social support, education, physical modalities, and medication
- Complementary and alternative therapies: cardiovascular fitness training, cognitive behavioural therapy, trigger point injections, EMG-biofeedback, massage therapy, acupuncture
- Pharmacologic management of fibromyalgia syndrome includes an analgesic, specifically tramadol, an antidepressant such as duloxetine, an anticonvulsant such as pregabalin and a sedative to improve the sleep pattern of the patients
  - In general, drugs should be started at low doses and built up slowly

### **COMPLICATIONS**

- Most patients with fibromyalgia continue to have chronic pain and fatigue
- Approximately 10 to 30 percent of patients with fibromyalgia report that they are work disabled, a higher incidence than some other groups with chronic pain

### **PATHOPHYSIOLOGY**

- Fibromyalgia is now considered to be the most common cause of generalized, musculoskeletal pain in women between ages of 20 and 55 years
- Despite the numerous abnormalities described in patients with fibromyalgia, there is as yet no generally agreed upon explanation for the pathogenesis of the disorder; the most plausible hypothesis suggests that, in genetically predisposed individuals, various stressors induce a heightened sense of pain and hypersensitivity to numerous stimuli
- Fibromyalgia is currently considered to be a disorder of pain regulation, classified often under the term central sensitization
- Alterations in pain and sensory processing in the central nervous system are present in FMS
  - Patients perceive noxious stimuli, such as heat, electrical current or pressure, as being painful at lower levels of physical stimulation than do healthy controls
- Altered pain processing: increased temporal and spatial summation of pain, decreased endogenous pain inhibition, upregulation of opioid receptors in the periphery and reduction of opioid receptors in the brain

### **REFERENCES**

- Barash P. 1515; UpToDate

# Phantom Limb Pain

Phantom pain refers to painful sensation perceived in a body part that is no longer present subsequent to surgical or traumatic removal. It is most common after the amputation of a limb, (i.e., phantom limb pain), but it has also been reported after the surgical removal of other body parts, such as breast, rectum, penis, testicles, eye, tooth, tongue, or lesion of peripheral or central nervous system. Phantom limb pain is distinguished from stump pain, which is pain in the residual limb or stump, and phantom limb sensation, which is nonpainful sensation of the absent part. Peripheral, spinal segmental, central, and psychological mechanisms are considered factors for the development of phantom limb pain.

## EPIDEMIOLOGY

- ☑ Occurs in 50% to 80% of all amputees and the incidence is unchanged at 2 years post-amputation
- ☑ Phantom limb sensation is seen in 85% to 95% of amputees in the three weeks after amputation
- ☑ In 8% of patients it is delayed for 1 month to 12 months
- ☑ Most phantom sensations resolve after 2 to 3 years without treatment
- ☑ Stump pain is reported in up to 50% of amputees and 50% to 80% of these patients also report phantom limb pain

## PATHOPHYSIOLOGY

- ☑ Central factors
  - ☞ Increased activity of peripheral nociceptors leads to a permanent change in the structure of the dorsal horn of the spinal cord (central sensitisation)
  - ☞ Increased excitability of dorsal-horn neurons, reduction of inhibitory processes and structural changes at the central nerve endings of the primary sensory neurons
  - ☞ Peripheral nerve injury can lead to degeneration of C-fibre terminals in lamina II, which may induce sprouting of A-fibre terminals into the area. Their input may then be interpreted as noxious (allodynia)
  - ☞ Another mechanism is a “phenotypic switch” in which Aβ fibres express neuropeptides (such as substance P) normally expressed by nociceptor fibres (Aδ and C fibres)
  - ☞ Changes also occur in the neuromatrix (a network of neurons in the thalamus, somatosensory cortex, reticular formation, limbic system and posterior parietal cortex) that form a neurosignature or body image
- ☑ Peripheral factors
  - ☞ Peripheral factors are likely important as evidenced by the high correlation between stump pain and phantom limb pain
  - ☞ When peripheral nerves are cut or injured regenerative sprouting of the injured axon occurs. In this process, a neuroma in the residual limb may be formed (enlarged and disorganised endings of C fibres and demyelinated A fibres that show an increased rate of spontaneous firing)
  - ☞ Peripheral “noise” may lead to increased central neuronal reorganisation
  - ☞ The sympathetic nervous system may trigger ephaptic (non-functional connections between neurons) transmission, sympathetic activation of nociceptors and activation of low-threshold mechanoreceptors that trigger sensitised spinal-cord neurons
- ☑ Psychological factors
  - ☞ Patients reporting phantom limb pain have been shown to be more rigid, compulsive and self-reliant than their cohorts
  - ☞ Likely do not contribute to the causation of pain but may affect the course and severity of the pain
  - ☞ Psychological disturbances related to the loss of a limb or feelings of dependence, as well as chronic pain and disability may lead to a host of psychological problems

## CLINICAL PRESENTATION

- ☑ May be related to a certain position or movement of the phantom and may be elicited or exacerbated by a range of physical factors (changes in weather, pressure on the residual limb) and psychological factors (emotional stress)
- ☑ Pain is typically more intense in the distal portions of the phantom
- ☑ Pain can have several different qualities
  - ☞ Stabbing
  - ☞ Throbbing
  - ☞ Burning
  - ☞ Cramping
- ☑ Pain is usually similar to the pain before the amputation
- ☑ Most commonly occurs after the amputation of an arm or leg but can occur after removal of other body parts or lesions to the peripheral or central nervous system
  - ☞ removal of breast, rectum, penis, testicles, eye, tongue or teeth
  - ☞ avulsion of brachial plexus
  - ☞ paraplegia
- ☑ More likely to occur if the patient had chronic pain before the amputation
- ☑ Less likely to occur in the very young
- ☑ About 30% of patients report the feeling of telescoping
  - ☞ The retraction of the phantom towards the residual limb, often disappearing into the limb
  - ☞ Associated with more phantom limb pain
- ☑ Pain may be referred to the phantom when skin adjacent to the amputated limb is stimulated
- ☑ May also occur with areas of skin at remote sites

## RISK FACTORS

- ☑ Phantom limb sensation
- ☑ Stump pain
- ☑ Pain prior to amputation
- ☑ Cause of the amputation
- ☑ Prosthesis use
- ☑ Bilateral amputation
- ☑ Lower limb amputation
- ☑ Above knee/elbow amputation

## TREATMENT

- ☑ **Pharmacological**
  - Conventional analgesics
  - Opioids\*

β-blockers  
Neuroleptics  
Anticonvulsants  
NMDA-receptor antagonists (Ketamine\*, Memantine‡)  
Antidepressants  
Barbiturates  
Muscle relaxants

**☑Surgical**

Stump revision  
Neurectomy  
Sympathectomy  
Rhizotomy  
Cordotomy  
Tractotomy  
Dorsal column stimulation  
Deep brain stimulation

**☑Anaesthetic**

Nerve blocks  
Epidural blockade  
Sympathetic block  
Local anaesthesia  
Lidocaine\*

**☑Psychological**

Electromyographic biofeedback  
Temperature biofeedback  
Cognitive-behavioural pain management  
Sensory discrimination training\*  
Hypnosis

**☑Other**

Transcutaneous nerve stimulation (TENS)\*  
Acupuncture  
Physiotherapy  
Ultrasound  
Manipulation  
Prosthesis training

\*At least one controlled study with a positive result has been done

‡A controlled study with a negative effect on phantom limb pain has been done

**Prevention**

☑Epidural anesthesia

Pre-, intra-, and post-op epidurals have been studied in an attempt to prevent phantom limb pain and results have been inconsistent

☑Regional anesthesia

Again, results have been inconsistent but continuous brachial plexus analgesia in one study showed significant decreases of phantom limb pain

☑Post-op ketamine in one study showed a modest decrease in the incidence but a major decrease in the severity of phantom limb pain

☑Calcitonin, intravenous lidocaine and TENS have also been investigated with no positive results

**REFERENCES**

Miller 7<sup>th</sup> Edition

Essentials of Physical Medicine and Rehabilitation 2<sup>nd</sup> Edition Frontera.