

# Efficacy of Osteopathic Manipulative Therapy in Neuropathic Pain

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## ABSTRACT

Chronic neuropathic pain arises from peripheral and central sensitization following tissue injury, where inflammatory cytokines lower pain thresholds and amplify responses. Current treatments rely heavily on pharmacologic therapies, which carry risks of dependence, while osteopathic manipulative treatment (OMT) offers a non-pharmacologic alternative. This case describes a 48-year-old male with chronic pain poorly controlled by multiple medications who experienced significant symptom relief following OMT, with a reported 50% reduction in pain lasting several days. The findings suggest that OMT can be an effective and safe adjunct therapy, potentially enhancing natural pain modulation, improving circulation, and reducing reliance on medications.

## INTRODUCTION

Chronic pain disorders develop due to both peripheral and central sensitization of pain. The origin of pathogenesis of neuropathic pain is related to an initial tissue injury. This injury causes inflammation of the tissue and a spike in inflammatory cytokines, most notably TNF- $\alpha$ , IL-1 $\beta$ , IL-6, and IL-8. These multifunctional cytokines help to regulate the body's immune response on top of inflammation (Akiria et al., 1990). Activated cytokines sensitize nerve endings, causing lower thresholds of stimulation to elicit pain response (Sutalovic et al., 2019). As a result, a smaller initial stimulus can produce the same level of pain, and over time even minimal input may trigger an exaggerated pain response.

In addition, pain can be amplified through expansion of the receptive field. Repetitive firing of nociceptors leads to increased neurotransmitter release in the dorsal horn. Specifically, the release of glutamate, ATP, and substance P are relayed to neurons that enter areas of the brain related to pain perception including the thalamus, hypothalamus, amygdala, prefrontal cortex, and brainstem (Ohasi et al, 2023). This pathway can become overactive, with the brain remaining in a heightened state even when pain input signals are absent. These mechanisms are the basis behind certain chronic pain syndromes affecting both men and women.

The current mainstay of chronic pain treatment is pharmacological, through the use of NSAIDs and opioids, all of which have a potential for addiction and harm.

Osteopathic manipulative treatment provides a medication-free approach and can help to benefit chronic pain and ultimately reduce reliance on drugs. Incorporating OMT into treatment plans may also improve functional outcomes and overall quality of life for patients.

## CASE PRESENTATION

A case review was conducted of a forty-eight year old male presenting for osteopathic management of chronic neuropathic pain. Past medical history includes chronic low back and sacroiliac joint pain secondary to motor vehicle collision. Patient's current pain medication regimen includes fentanyl 50mcg/hr patches every seventy-two hours, duloxetine 60mg 1/day, gabapentin 600mg 4/day, baclofen 20mg 4/day, diclofenac sodium 1% gel 2/day, naproxen 500mg 2/day, oxycodone 15mg 4/day. Patient reports pain is poorly controlled. Review of systems positive for myalgias, joint pain, stiffness, and back pain.

**Physical Exam:** Aaox3, normocephalic and atraumatic, normal affect and demeanor.

**Ant. Post. Spinal Curves:** Cervical Lordosis, Thoracic Kyphosis, Lumbar Lordosis. **Skull/Neck (Lateral Spine Curves):** Cervical Curvature, Cervical Flexion, Cervical Extension, Cervical Rotation, Cervical Lateral Flexion. **Assessment Tools:** Palpation, Range of Motion, Reflexes, Neurological, Viscerovisceral, Primary Musculoskeletal, Cardiovascular, Pulmonary, Activities of Daily Living, Gastrointestinal, Other. **Severity Key:** 1 No SD or Insignificant (SD) levels, 2 Mild SD or Insignificant (SD) levels, 3 Mild to Moderate (SD) level or symptoms, 4 Moderate to Severe (SD) level or symptoms. **Specific Major Somatic Dysfunctions:** Head, Neck, Thoracic (T1-4, T5-8, T9-12), Lumbar, Pelvis/Sacrospin, Pelvis/Sacroiliac, Extremity Lower, Extremity Upper, Ribs, Other/Abdomen. **Major Correlations with:** Neurological, Viscerovisceral, Primary Musculoskeletal, Cardiovascular, Pulmonary, Activities of Daily Living, Gastrointestinal, Other.

Fig 1: Template from the Museum of Osteopathic Medicine

### Osteopathic Structural Exam:

- T1-T12: Tight paraspinals bilaterally right greater than left
- Ribs: Right 1st rib exhalation dysfunction, right 7th rib exhalation dysfunction
- Lumbar: Tight paraspinals bilaterally right greater than left
- Pelvis: Spring positive on right, ASIS equivalent, left on left sacral dysfunction

### Osteopathic Manipulative Treatments:

- Rib cage: Myofascial release and Still technique
  - Thoracic: Myofascial release
- Lumbar: Myofascial release and muscle energy
  - Sacral: Sacral rocking and Still technique
  - Pelvis: Muscle energy

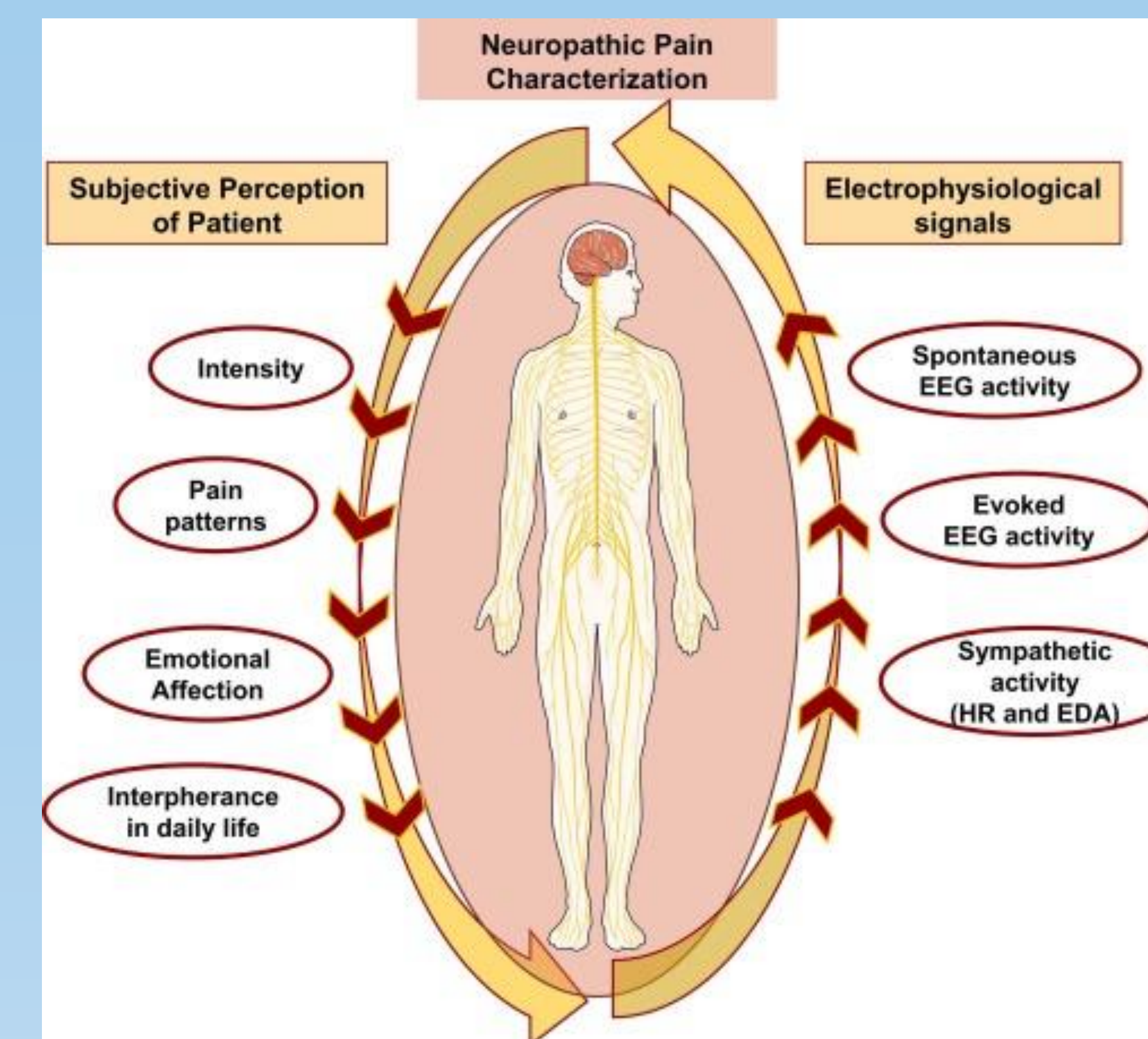


Fig 2: Zolezzi, Daniela et al., 2022

## RESULTS

Patient tolerated treatment well and noted significant improvement in symptoms. No adverse effects besides minor stiffness 24hr after treatment noted. Patient reported 50% reduction in pain post treatment, lasting 3-4 days. Patient especially noted a difference in pain reduction when fentanyl patch started to wear off on day three.

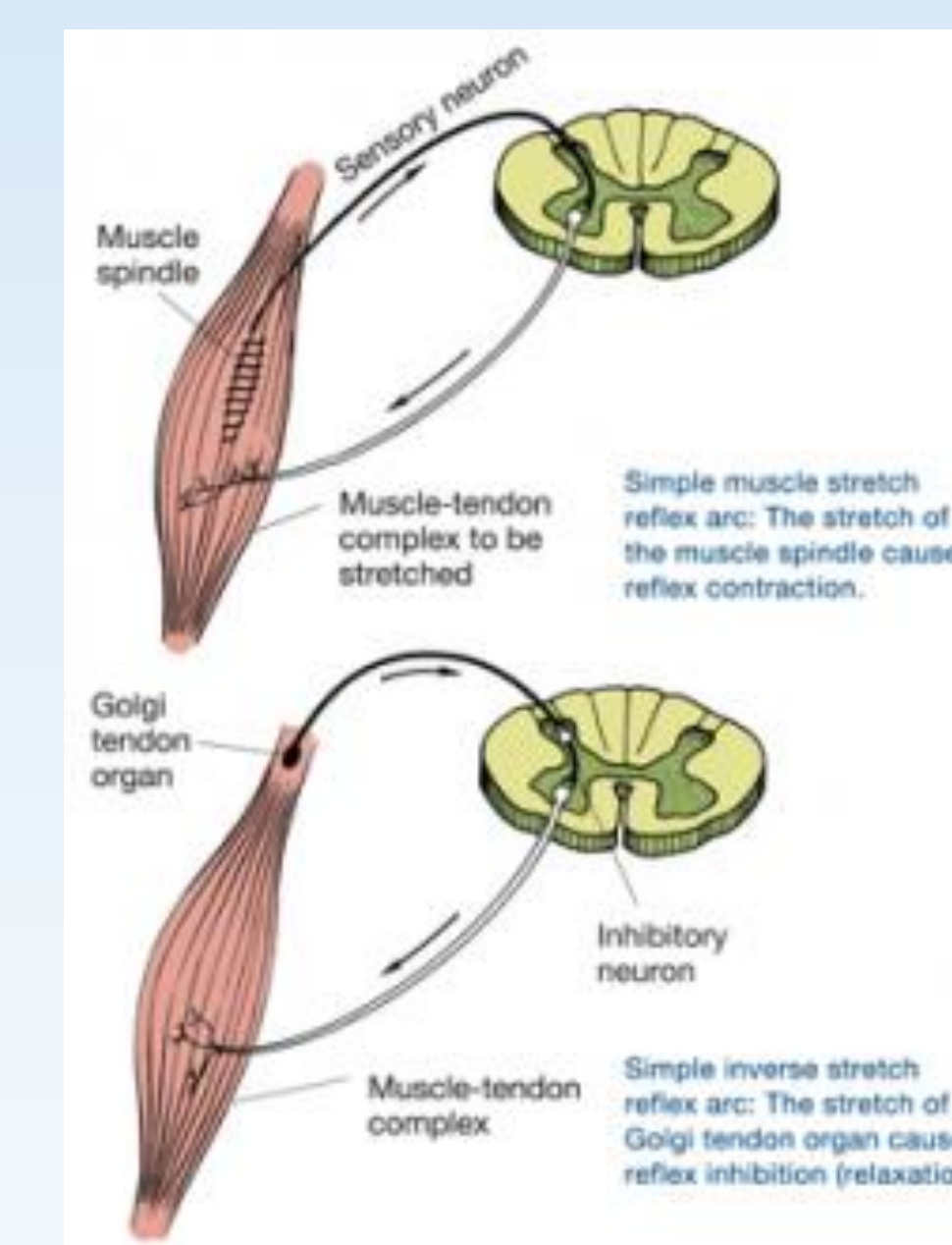


Fig 3: Osama, Muhammad et al., 2017

## CONCLUSION

This case demonstrates the value of integrating osteopathic manipulative treatment (OMT) with pharmacologic therapies in managing neuropathic pain. OMT supports the body's intrinsic pain-regulating mechanisms by promoting the release of natural analgesics such as endorphins and endocannabinoids. In addition, these techniques enhance tissue function and circulation, improving blood flow and lymphatic drainage, which facilitates healing and alleviates pain.

## CONCLUSION CONT.

By addressing both the underlying causes of pain and the patient's perception of it, OMT serves as a safe and effective adjunct in the management of chronic pain. The techniques highlighted here represent only a portion of what can be applied in outpatient care. Importantly, treatment should always be individualized, with a focus on correcting patient-specific somatic dysfunctions to best meet their needs and relieve symptoms. Furthermore, OMT can support overall physiologic balance by encouraging the body's natural capacity for self-healing and regulation. Easily incorporated into routine office visits, OMT has the potential to significantly improve patient outcomes and quality of life.

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