

Dry Needling for Pelvic Alignment Issues Post Hip and Knee Replacement Surgeries

Vidit Atul Phanse

ATI Physical Therapy, Plainfield, IL, USA

Email: [viditp1992\[at\]gmail.com](mailto:viditp1992[at]gmail.com)

Abstract: *Hip and knee replacement surgeries are among the orthopedic procedures, which can result in muscle imbalances and alignment issues in the pelvis after surgery. These issues may cause pain and functional limitations potentially requiring therapeutic interventions. Dry needling, a method that involves inserting needles into muscles to target trigger points, has shown clinical effectiveness in treating these muscle related problems that lead to postoperative pain. This article delves into the use of needling for managing alignment issues following hip and knee replacement surgeries. It also discusses the mechanics of function after surgery. The potential muscle imbalances that can cause complications. By reviewing existing literature and clinical experiences this article aims to offer an insight into how dry needling can be utilized as a treatment option for pelvic alignment problems.*

Keywords: dry needling, hip replacement, knee replacement, muscle imbalances, pelvic alignment

1. Introduction

Total hip replacements and total knee replacement surgeries constitute a significant proportion of orthopedic procedures globally. These surgeries often are elective due to arthritic conditions leading to painful joints, aiming to alleviate pain and improve function. However, they can result in postoperative complications such as muscle imbalance and pelvic alignment issues, which dry needling may help address and reduce the recovery time.

Background on Joint Integrity, Muscles, and Joint Replacement

Patients undergoing hip or knee replacements often present with pre-existing muscle imbalances and atrophy, which are exacerbated post-surgery by swelling, pain, and inactivity (Deyle, 2005). Restoration of muscle tone, strength, proprioception, and function is crucial for optimal recovery. The mechanics of joints post-surgery involve complex interactions, affecting both the operated and adjacent joints. Commonly, patients experience gait deviations, leading to reduced weight bearing on the operated side and compensatory overuse of the non-operated side (Brotzman & Wilk, 2003).

Mechanics of Joints Post-Surgery

Post-surgical gait typically involves compensations that result in less weight bearing through the operated leg and more weight bearing through the non-operated leg. These

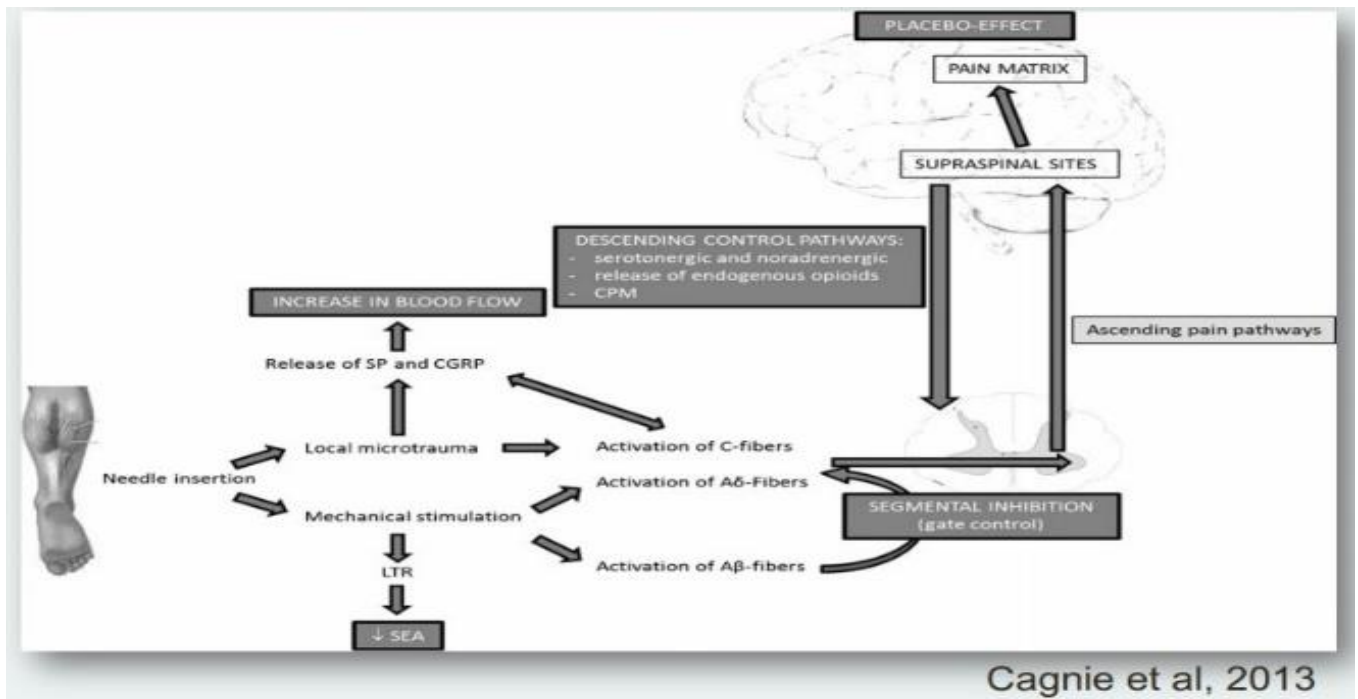
compensations result in muscle imbalances. On the operated side, we typically find the gluteal group, piriformis, iliotibial band (IT band), the vastus lateralis, and gastrocnemius are weakening, while those on the non-operated side are often tight and weak, specifically, the lumbar extensors, quadratus lumborum, psoas/hip flexors, quadriceps, adductors, and tibialis anterior and posterior (Kaltenborn, and Evjenth 2009).

Muscle Imbalance Potential Problems

- 1) Weight bearing on the good side could result in greater joint cartilage wear and tear.
- 2) Sacral and lumbar rotation can cause innominate rotation (rotation of the triangle-shaped bone on either side of the sacrum) or vertical shifts that can lead to lower back pain, arthritic changes and problems with discs (Travell et al, 1999).
- 3) Many of their patients show symptoms of joint pain, hip bursitis, plantar fasciitis and other ankle-related pathologies (Tough et al, 2009).

Introduction to dry needling in Arthroplasty Patients

With dry needling, a practitioner uses very fine stainless-steel needles to deactivate myofascial trigger points (hyperirritable spots in muscles) to help in reducing pain. The 'one needle, one stick' method is used to help reduce the risk of infection. Dry needlers must practice according to the guidelines set by their respective states and federal levels, and must obtain consent from their patients, who are informed about the possible risks and benefits (e.g., Dommerholt 2013; Dommerholt and Fernández-de-las-Peñas, 2013).



When Should Dry Needling Be Introduced?

Dry needling should be started eight weeks postoperatively under strict precautions and contraindications assessment afterwards. Care must be taken not to allow the needle to touch or encounter the patient's prosthetic device to avoid the risk of infection. For example, in those cases where knee replacement has been performed, dry needling should never be done on proximity to the knee joint (Ma et al., 2005).

Muscles Commonly Treated

The individual muscles treatments may vary depending on patient signs and symptoms. For lower back pain or hip bursitis, muscle commonly treated may include the gluteus medius and minimus, tensor fascia latae, lumbar paraspinals, quadratus lumborum, vastus lateralis, and IT band. The gluteus medius and minimus are often associated with hip stability and gait, and dry needling can help them achieve their optimum function (Dutton, 2011). The tensor fascia latae, which has similar functions to the IT band, can be tight and tender, contributing to pelvic dysfunction. Dry needling the lumbar paraspinals and quadratus lumborum can help reduce lower back pain that often accompanies innominate rotations or upshifts.

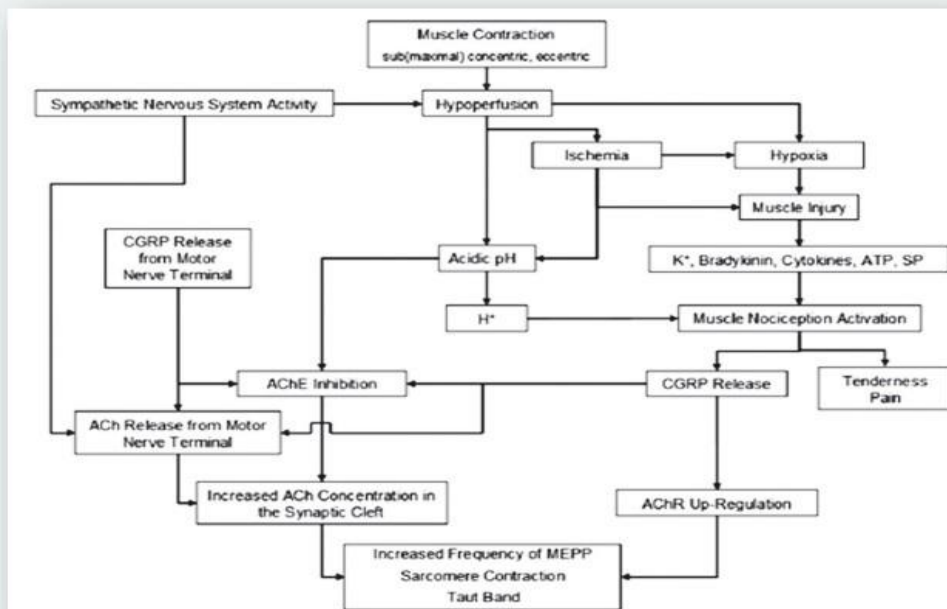
For knee pain, treatment may focus on hip flexors on the non-operated side, vastus lateralis, gluteus Medius, tensor fascia latae, gastrocnemius, and tibialis anterior on the operated side. The hip flexors can show symptoms of increased tightness due to over activation to compensate for other changes, and addressing their tightness can relieve knee pain.

The vastus lateralis is part of the quadriceps muscle group and is critical for knee extension and stability (Deyle, 2005). The gastrocnemius and tibialis anterior play vital roles in lower leg function and gait, and their treatment can alleviate knee pain and improve overall mobility.

For ankle or foot pain, treatment may include the tibialis anterior and posterior, gastrocnemius, soleus, plantar fascia, and flexor digitorum longus. These muscles are essential for foot stability and movement, and dry needling can help address pain and dysfunction reducing from compensatory mechanisms post-surgery. The gastrocnemius and soleus are key in plantar flexion, and their involvement in ankle pain often demands direct intervention (Kietrys et al., 2013).

Assessment and Expectations

Therapists treating these patients need to make sure thorough assessment is performed and key muscles need to be identified which might be leading to painful symptoms. Some patients will respond favorably with almost immediate results. Setting realistic expectations is essential, as dry needling can cause temporary changes in muscle length and tension. These changes must be then addressed with interventions such as stretching and strengthening exercise to enhance muscle strength. In cases where symptoms persist, reassessment and adjustment of the treatment approach are necessary (American Physical Therapy Association, 2020). This adjustment may include reassessment of muscle tension and muscle tightness that might be more symptomatic than others leading to the nociceptive sensations.



Gerwin et al, 2004

2. Conclusion

Dry needling post-surgery can be a game changing intervention for addressing pelvic alignment issues post hip and knee replacement surgeries. Therapists can target specific muscles imbalances induced by surgeries and can help patients restore muscle function and alleviate pain. However, careful patient assessment, adherence to guidelines, and a holistic approach that includes exercise and stretching are essential for optimal outcomes. Future research should focus on standardized protocols and long-term effects to further validate the efficacy of dry needling in this patient population. Further studies can also include effect of dry needling in patients treated with and with out dry needling on mental health due to pain.

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