

Research Paper Review

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Two Examples of 'Cuboid Syndrome' with Active Bony Pathology: Why Did Manual Therapy Help?

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ABSTRACT

Cuboid syndrome describes lateral midfoot pain localised to the cuboid bone. Previously reported case studies promoted joint mobilisation or manipulation interventions. The assumed mechanism was correction of a subtle disruption to the calcaneocuboid joint position. There is an absence of evidence for correction of joint position, but there is evidence of neurophysiological mechanisms for pain modulation. This case study reports on a patient who suffered two occurrences of cuboid syndrome on opposite feet, three years apart. With both occurrences, joint mobilisation achieved rapid and lasting resolution of severe pain and functional limitations. This occurred despite the presence of an active bone pathology at the symptomatic cuboid (demonstrated with nuclear imaging), which could represent a stress reaction, transient osteoporosis, ischaemic necrosis, infection or neoplasm. This case contributes three considerations for clinical reasoning and manual therapy research. 1. Active local bone pathology could exist in other patients with pain at the cuboid, and other conditions where symptoms resolve with joint mobilisation. 2. Rapid and lasting symptom resolution fits with a hypothesis that joint mobilisation acted to reverse neurological sensitisation. 3. Lasting symptom resolution may be clinically associated with manual therapy, but mechanisms extending beyond temporary analgesia are yet to be identified.

BACKGROUND INFORMATION

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Cuboid Syndrome

Cuboid syndrome is a term that vaguely describes a clinical presentation of lateral midfoot pain caused by a hypothesized disruption of calcaneo-cuboid joint congruency. Symptoms are theorized to present subsequent to sudden traumatic overload, or repetitive overuse.

The diagnosis of cuboid syndrome is based on the practitioner localizing the pain at the site of the cuboid on the foot, after excluding any other neural or anatomical structures as the potential culprit. Manual therapy techniques targeted to the cuboid aim to push the bone dorsally from the plantar

aspect of the foot. These techniques have shown promise in reducing pain and increasing tolerance to weight bearing in a published case study (1). With this being said, research has yet to prove that the manoeuvre creates any long-lasting change in the position of the cuboid relative to the anatomical structures surrounding it – namely the calcaneus, lateral cuneiform and lateral metatarsals.

Studies have shown that manual therapy has an established general neurophysiological mechanism, which modulates pain at various levels of the nervous system. While this has been demonstrated in various joints throughout the body, a neurophysiological mechanism of action has not been specifically demonstrated in the midfoot.

This paper reviewed two cases involving the same patient, who presented twice with cuboid syndrome (once on each side) with radiological demonstration of active bone pathology as a unique example of lateral midfoot pain, treated with targeted physical/manual therapy. The aim of this case study review is to describe how manual therapy can help alleviate symptoms in spite of the presence of active bony pathology. The case also highlights a new perspective on how the nervous system might be involved in creating the symptomatic and functional improvements patients experience post-treatment.

CASE DESCRIPTION

First Clinical Presentation

A middle-aged female suffering from an insidious onset of right lateral midfoot pain presented to a physical therapy clinic with a provisional diagnosis of a proximal cuboid stress fracture, demonstrated via plain film and bone scan.

The patient presented to a physiotherapist in January 2007 with a rated 8/10 pain that was aggravated by all weight bearing activities. Mild swelling was visualized over the dorsum of the foot. Swelling and pain were aggravated with all weight bearing activities, and lasted for days after walking 2-3 km on flat terrain over the course of 30 minutes. These signs were typically reduced with rest and elevation. Orthotic inserts were prescribed previously, with no change in symptoms.

The examination revealed antalgic gait, with right foot pain in the stance phase. Palpation revealed boggy swelling on the dorsal-lateral aspect of the right foot. Dorsal-to-plantar digital palpation of the cuboid reproduced the patient's chief complaint.

The patient was treated 4 times over the course of 28 days with cuboid mobilizations in the plantar-todorsal direction (see picture below), soft tissue therapy to the triceps surae and active patient stretches for dorsiflexion range of motion. Also, a 7mm Woolen felt support was positioned under the cuboid to provide pressure in a plantar-dorsal direction (see picture below). Additionally, low-Dye taping for support along with mini-stirrups to lock off the tape was applied. Finally, the patient was educated on the neurophysiological mechanism of sensitization that occurs with persistent MSK conditions. From here, the patient was graduated to weight bearing walking activities and heel raise exercises.

Subsequent to performing plantar-to-dorsal cuboid mobilizations, the patient reported a 60% reduction in pain. By the 3rd session (9 days post-presentation) the patient reported only mild discomfort with toe-off. By the 4th treatment, no pain with activities of daily living was reported.



Second Clinical Presentation

Three years later, the same patient suffered from a similar presentation on the left foot. Radiologists reported a potential early stress fracture without cortical breach. The patient was given a rocker-boot to immobilize the left tarsals.

In this case, seven treatments were performed over the course of 54 days. Plantar-dorsal mobilization of the left cuboid was performed, leading to a similar immediate reduction in symptoms during gait. Additionally, deep tissue massage to the triceps surae, felt pad support under the cuboid and home stretches were provided. After the second treatment, the patient reported a 40-50% decrease in symptoms, and she had not needed the rocker boot post-treatment.

The third treatment necessitated a higher-grade mobilization along with a thrust manipulation targeting the cuboid due to a mild recurrence of pain. This resulted in pain relief during gait. By the 7th treatment, the patient's pain and symptoms resolved completely.

CLINICAL APPLICATION & CONCLUSIONS

This case report discussed 2 separate presentations of cuboid syndrome in the same patient. Both were thought to be an effect of early stress fracture, which resolved through the use of manual therapy to the painful joint. This is an interesting case describing how very few treatments can result in reduced pain and improved function, in spite of the presence of active local bone pathology found with imaging.

The authors offer some ideas as to why manual therapy was beneficial in the presence of active bone pathology in this case:

- 1. Strong evidence exists that manual therapy can cause hypoalgesia due to an activation of the central nervous system. The fact that symptom reduction occurred within minutes following treatment supports the theory that neurosensory pain modulation is the primary effective mechanism behind manual therapy, rather than repair of tissue pathology. The often immediate and persistent benefit of manual therapy, even in the presence of local tissue pathology, gives reason to continue investigating the neurosensory mechanisms involved in this form of treatment.
- 2. The authors surmise that the bony pathology present may have contributed a chemical stimulus for nociception, initiating the patient's pain perception, and a cascade of sensitization of the nervous system. They assert that instead of manual therapy having a temporary effect, manual therapy might have addressed the neural sensitization process, leading to a longer lasting clinical benefit.

This case report is an example of how manual therapy can help patients symptomatically and functionally in spite of what is seen on imaging. This example can be added to our body of knowledge and inspire further research into the mechanisms of manual therapy.

STUDY METHODS

This is a case report, and thus no analysis was performed.

STUDY STRENGTHS / WEAKNESSES

This was a very novel case of manual therapy proving helpful even in the face of bony pathology. This should remind practitioners to treat the patient, not the image! However, it was just a case report. While this approach worked in an N of 1, who knows how many individuals manual therapy might have helped if there were 100 or 1000? Did this practitioner get lucky? Clearly, an RCT would allow us to gain further insight into the comparative value of different treatment approaches.

Additional References:

1. Adams E & Madden C. Cuboid subluxation: a case study and review of the literature. Curr Sports Med Rep 2009;8:300-307.

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