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Can Massage Therapists And Myotherapists Evaluate And Treat Cuboid Syndrome?

INTRODUCTION: Cuboid syndrome is a pain syndrome of the soft tissues in the proximity of the cuboid most likely involving the surrounding ligaments, joint capsule, unique labrum of the calcaneocuboid joint, and may involve the tendon of the peroneus/fibularis longus muscle, which wraps around the cuboid groove. Cuboid syndrome is associated with lateral ankle sprains and is primarily diagnosed with hands-on testing including palpation, passive motion testing and pain provocation tests. There is no reliable imaging test. A few and only a few authors specifically mention dorsal cuboid subluxation[i,ii,iii] whereas the majority of the literature focuses on plantar cuboid subluxations and describe direct treatment to the cuboid induces vertical mobility (named cuboid whip and cuboid squeeze).[iv,v,vi] The author, in contrast with the literature finds dorsal subluxations to be more common and will make a case for that finding, will describe how it involves several major articulations and will discuss evaluation and treatment.

Soft tissue evaluation of the ligaments, peroneus/fibularis longus muscle and tendon is relevant to soft tissue therapists. Completely missing in the literature is mention of the fact that this population oftentimes presents with tight hip external rotators on the same side. The pattern of tightness maintains the hip in slight external rotation and correlates with an increase lateral weight-bearing in the foot encouraging a supinatory, rigid pattern in several joints in the foot and ankle. Soft tissue clinicians are ideal to share care with other professions who treat cuboid syndrome, primarily podiatrists and physical therapists, especially those involved in the dance and sports populations.

ANATOMY AND MOVEMENT: The bony anatomy of the cuboid including the shape of the various articulations, ligaments and muscle are found in Figures 1-4.

The function of the cuboid is easy to discern based on the shape of the joint surfaces which allow for triplane movements. The cuboid participates in the following movements: medial rotation coupled with inferior glide, dorsiflexion and adduction (pronation) lateral rotation with superior glide and abduction and plantarflexion (supination). In midstance the cuboid is essentially in neutral and through toe-off moves into supination. At heel strike it begins to pronate. Given that it articulates with the following, the cuboid works in concert with the navicular, the cuneiforms, the 4th and 5th metatarsals and especially with the calcaneus (Figure 1.). It appears to be the case that due to the fact that in the majority the cuboid does not articulate with the navicular, the significant influence the navicular has on cuboid pronation and

supination[vii] appears to be under-appreciated and is otherwise not mentioned in the literature on cuboid syndrome. The shape of the calcaneocuboid joint is visualized in Figure 2. The utility of evaluating midfoot motion will be addressed in the treatment section.

The articles reviewed by the author only focus on biomechanics and evaluation of the lateral column of the foot and ankle or on gross movements thereof, without mention of isolated mid-foot pronation and supination and rearfoot pronation and supination how this influences cuboid function. Only two references specifically address isolated biomechanics of the rearfoot as it relates to cuboid mobility. The rear foot is comprised of the calcaneus and inferior talus also referred to as the subtalar or talocalcaneal joint. This joint has a significant influence on mobility of the cuboid as the largest articulation with the cuboid is the sellar-shaped (saddle) calcaneo-cuboid joint. Observing the shape of the articular surfaces easily predicts the afore mentioned movements. These will be expounded upon, as they are very relevant to normalizing cuboid mobility.

TREATMENT: The majority of the literature makes reference to the cuboid whip and cuboid squeeze with contact on the plantar surface of the foot with pronation, which are described as restoring dorsal mobility of the cuboid. Jennings and Davies (2005 p. 414) describe patients who do not respond to the cuboid whip describing them as "Many patients may have a clinical presentation similar to cuboid syndrome with only subtle variations, however, have a different underlying pathology. These patients, not surprisingly, typically will not respond to treatment with the use of cuboid manipulation [cuboid whip]." This author suggests that these patients may present with a dorsal displacement of the cuboid and may benefit from the opposite of a cuboid whip in which there is a plantar directed force applied with medial rotation coupled with adduction. However, this author restores cuboid mobility by directly treating the calcaneo-navicular and talo-navicular joints, without any need to use direct contact on the cuboid.

The practice act for some soft tissue healthcare practitioners may preclude "joint mobilization" if gross range of motion and stretching is allowed, they can be very effective with this patient population. Furthermore, as cuboid syndrome is oftentimes missed, it is valuable that ancillary healthcare providers are knowledgeable in recognizing this diagnosis and it may facilitate appropriate referral. The following techniques in my practice restore normal superior and inferior glide and rotation in a stuck cuboid (I specifically evaluate pre and post) without directly touching the cuboid.

1. Passive medial rotation of the midfoot kept at end range while performing 30 oscillation. If the navicular lacked medial rotation it will block cuboid pronation, and this will normalize it.
2. Clasping the heel and tractioning it inferiorly for 2-minutes. This frees up the calcaneocuboid and talocalcaneal joint. It is optional to add twisting stretches during distraction moving the heel toward the opposite foot (abduction).
3. Active movement: for right side have the client stand with right hip/foot pointed forward while the left points out to end-range of external rotation. Gently twist the body to the left and maintain that position while performing 30 gentle oscillations to the left such that pronation in the right foot ultimately happens. The arch flattens and the heel everts. This is the home program I teach.
4. Test right hip internal rotation with client supine with legs straight. Clasp the distal femur and lower leg and internally rotate them to the left to the end-range/stop point. Keeping constant pressure add a mild thrust to evaluate the end-

feel. If it is tight compared to the other side or tight in comparison with norms, treat all external hip rotators. A remarkably effective self-treatment involves a 2 x 8” firmly rolled towel placed vertically above and below the trochanter maintained for 3-minutes.

CONCLUSION: Cuboid syndrome has been described with a review of the anatomy and movement, presentation, and a method of restoring normal movement without direct mobilization/manipulation has been presented. By restoring normal rearfoot and normal navicular mobility cuboid mobility is restored. Prevention includes addressing the hip external rotators. Massage therapists and myotherapists can effectively interact with this diagnosis.

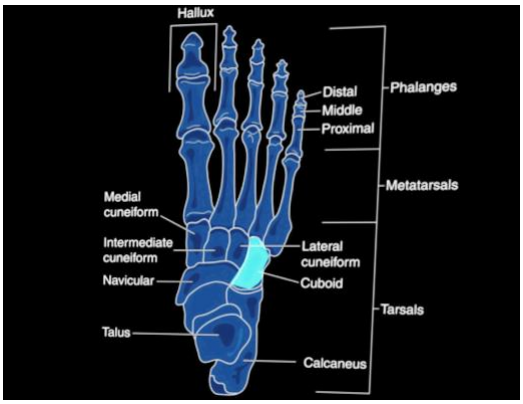

Figure 1. The cuboid bone in relation to the rest of the foot and ankle. From www.StatPearls.com.

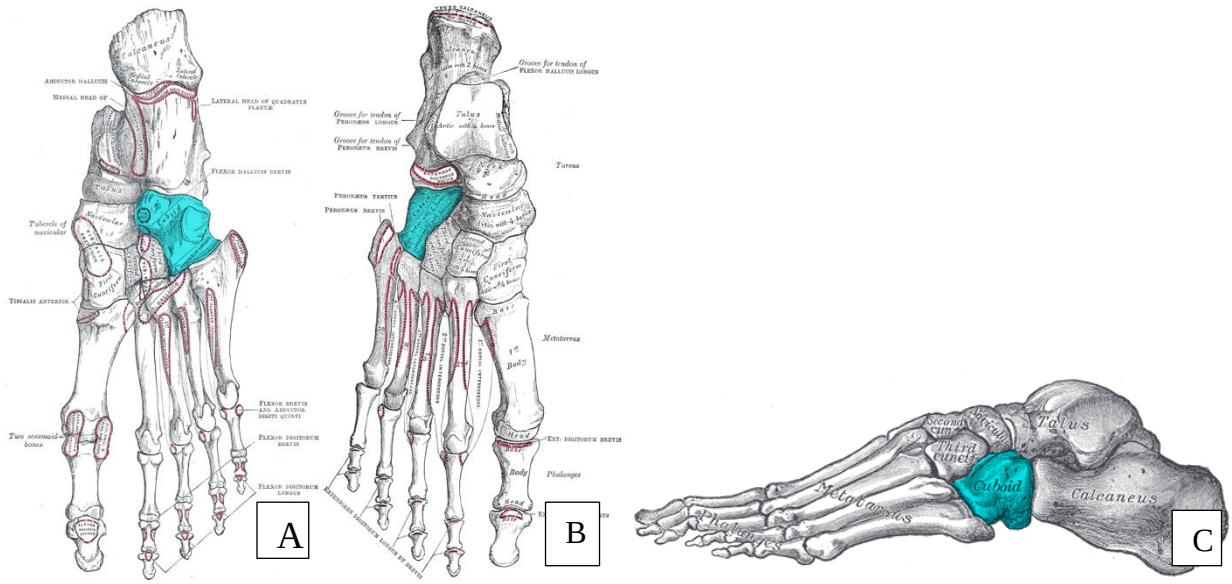

Figure 2. The sellar shape of the calcaneocuboid articular surface from a top, bottom, and side perspective. **A** denotes undersurface of cuboid, **B** the top and **C** is the lateral view. A pure medial

view is difficult to encounter per web search, however, it can readily be appreciated with images A, B, and C. From www.wikiopediacommons.com, www.KenHub.com.

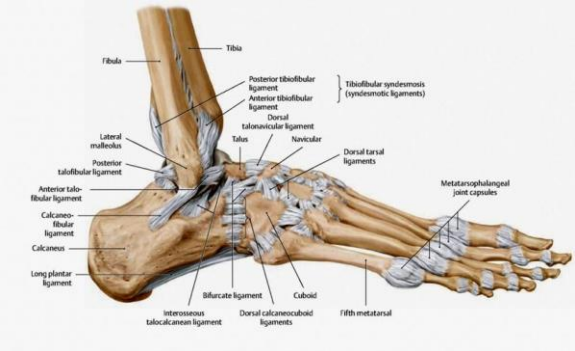

Figure 3. The ligamentous complex of the foot and ankle. From: The ligament complex of the foot, lateral view. www.ResearchGate.com.

Figure 4. Muscles and tendons of the lateral foot and ankle.

Figure 5. Testing hip internal rotation in supine. It is a different context and it is not unusual to find tightness that is not encountered in prone or sitting testing with knee bent 90-degrees. If motion is limited or end-feel is tight, hip rotators are restricted, except for rare developmental asymmetry. If mobility is reduced on one side with a much firmer end-feel the hip rotators (all of

them) are restricted. This is a much more functional way of testing and restrictions will be encountered when the traditional test (prone with knee bent ninety degrees) is negative. This pattern can be unilateral and most common is with the right side being more restricted. However, it can present bilaterally. Recall that it is the end-feel that is critical. **Patient Position:** Supine. **Therapist Contact:** On the lower tibia. **Force and Direction of Force:** Gentle internal rotation, twisting the entire leg medially about a long axis.

Figure 6. Treating restricted hip internal rotation. **Treatment:** In supine, a 2-3" foam roll or tightly rolled hand towel placed vertically under the trochanter. Do a 5-minutes passive stretch. **Retest:** Retest mobility with P-A Spring Test, with client prone. **Home Program:** 2x a day x 1 week, 2x a week thereafter.

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