

## Title: GASTROCNEMIUS RECESSIO: A TREATMENT FOR FOOT PATHOLOGY ASSOCIATED WITH ISOLATED CONTRACTURE

### Abstract

An inability to achieve normal ankle range of motion is termed ankle equinus. Isolated gastrocnemius contracture (IGC), a type of equinus, is characterized by limited ankle dorsiflexion with full knee extension. IGC has been associated with various painful foot pathologies including: plantar fasciitis, hallux valgus, pathological flat foot, and metatarsalgia. Left untreated or treated unsuccessfully painful foot pathologies can severely affect quality of life. Acquired shortness of the gastrocnemius muscle renders it unable to stretch sufficiently during gait and other activities of daily living to accommodate normal ankle and knee joint range of motion. Consequently, patients demonstrate adaptations including: decreased ankle dorsiflexion during mid-to-late stance, increased knee flexion during mid-to-late stance, and/or early heel rise. These adaptations have the potential to aggravate existing conditions and may contribute to future disability. For example, early heel rise increases fore-foot pressure and duration of loading, thus may contribute to painful foot pathologies that restrict daily activities.

While conservative management is the current standard of care, gastrocnemius recession surgery is often the last resort to resolve painful foot pathologies in patients with isolated gastrocnemius contracture. Gastrocnemius recession involves release of the medial and lateral heads of the gastrocnemii from the gastrocnemius tendon. Although excellent clinical outcomes have been reported following corrective procedures for isolated gastrocnemius contracture, gastrocnemius recession is not a common treatment for patients with painful foot conditions associated with equinus. There may be concern as to how releasing the gastrocnemii will affect the kinetic chain and possibly predispose the patient to additional injury. These concerns may be in part due to the lack of quantitative biomechanical data reported in the literature leaving many questions unanswered.

Preliminary data does not indicate that there are post-surgical gait or strength mal-adaptations, however patients walk with a flexed knee gait both pre- and post-operatively which may contribute to the progression of knee osteoarthritis. Therefore, the overall goal of this work is to evaluate functional, strength, and gait measures, for a group of patients with disabling foot pain associated with isolated gastrocnemius contracture pre- and post-gastrocnemius recession surgery and to compare these results to healthy control subjects.