Pes Cavus Reconstruction Utilizing Intramedullary Nail Fixation in a Patient with Churg Strauss Syndrome

Sara Sharma DPM, John Watson DPM, Crystal N. Gonzalez DPM, AACFAS

Jefferson University Hospital , Stratford, New Jersey

Statement of Purpose

- Pes cavus foot type is typically associated with various neuromuscular diseases such as CMT, muscular dystrophy, Friedreich ataxia and cerebral palsy. All these disorders result in muscle weakness and neuropathy. Churg Strauss is a rare necrotizing vasculitis which affects small to medium size blood vessels. Some literature associates its neuromuscular symptoms to a pes cavus foot deformity. A patient presented to our institution with progressive bilateral pes cavus deformity due to Churg Strauss syndrome who underwent a total foot and ankle reconstruction with the use of intramedullary nailing.

Methodology

- We used a single stage approach to reduce the pes cavus deformity into a more rectus alignment using an intramedullary nail. To our knowledge there are no case studies using this type of internal fixation with a one year follow-up when Churg Strauss is the etiology of the progressive pes cavus deformity.

Case Report

- 42 year old male presented to office with a chief compliant of left foot pain. On examination of the patient, he stated that he suffers from a disease called Churg Strauss and understood that his polyneuropathy was due to his disease. He states that his left foot deformity has been progressing over the past few years with increasing pain. He recently had a 5th metatarsal fracture that was treated with a CAM boot for 6 months, and at the current time did not want to pursue surgery. He later consented to ORIF of the fifth metatarsal after partial weight bearing and bone stimulation failed to achieve boney union. Two months post-operative of ORIF of the fifth metatarsal, left ankle instability developed secondary to progressive pes cavus. At that time conservative care was suggested consisting. He underwent an AFO with physical therapy to improve proprioception and overall strength. At this time he declined surgical intervention. Ten months later the patient presented back to office due to increasing pain in the left ankle with unresolved instability. A CT scan was ordered which demonstrated a dislocated talus and a more progressive severe pes cavus deformity then initial presentation. He consented to surgery which consisted of a medial gastrocnemius recession with pantalar fusion with lateral wedging of the tibia.

Case Report (continued)

- First a medial gastrocnemius recession occurred, followed by a fibular takedown to allow access to the ankle joint. All cartilage was removed from the STJ and ankle joint respectively with lateral wedging of the tibia for proper alignment and reduction of the deformity. With accurate K wire placement and reaming a 10x200mm Stryker T2 intramedullary nail was placed through the calcaneus extending into the tibial shaft. Sequential, talar and calcaneal fully threaded screws where then driven to lock the tibial nail into place. Excellent compression was noted amongst the STJ and ankle joint.

Pre-Operative

Image 1a, 1b, 1c, 1d depict initial deformity clinically then radiographically

Post-Operative

Image 2a, 2b, 2c depict TTC arthrodesis via IM nail

One Year Post-Operative

Post-Operative Course

- Following admission to the hospital for pain control the patient was discharged a day later. He was kept non-weight bearing for one and a half months. Sequentially, he was transferred into a CAM boot with physical therapy and weight bearing as tolerated. He was then finally transitioned to a arizona brace.

Analysis and Discussion

- Pinherio et al demonstrated that Churg-Strauss was associated with lower extremity weakness and polyneuropathy in 60-70% of the patient population. Cho et al performed a similar study on 61 patients which demonstrated peripheral neuropathy and neuropathic pain. However, there was no literature on how to correct pes cavus with the underlying cause of Churg-Strauss.
- We decided to correct the deformity with pan-talar fusion with lateral tibial wedging and a gastrocnemius resection to reposition the foot in a rectus position. Total forefoot and heel loading was achieve with no inversion of the ankle. No ulcerations or deep tissue injuries developed with complete weight bearing at this time. Retrospectively, we would recommend adjunctive midfoot or forefoot procedures.
- We hope to bring awareness to the medical community that there are multiple causes of pes cavus besides the typical presentations and diagnosis's. An intramedullary nail is a reasonable operative modality to reduce the pes cavus foot type.

References

- Cho H, Yune S, et al. Clinical Characteristics and Treatment Response of Peripheral Neuropathy in the Presence of Eosinophilic Granulomatosis with Polyangiitis (churg-Strauss Syndrome) : Experience at a Single Tertiary Center. *Journal of Clinical Neurology*. 2017; 13(1)77-83.
- Groh M, Pangnoux C, Guilevin. Eosinophilic Granulomatosis with Polyangiitis: Where are we now? *European Respiratory Journal*. 2015; 46:1255-1258
- Hewitt Stephen, FCPods, Tagoe M.Surgical Management of Pes Cavus Deformity with an Underlying Neurological Disorder: A Case Presentation. *Journal of Foot and Ankle Surgery*. 2011; 50(2)235-240
- Kararizou E, Davaki P, Spengos K, Karandreas N, Dimitracopoulos A, Vassilopoulos D. Churg-Strauss syndrome complicated by neuropathy: a clinicopathological study of nine cases. *Clinical Neuropathy*. 2011: 30(1)11-7
- Shi Z, Mei G, Zhang C. Locking plate versus retrograde intramedullary nail fixation for tibiotalocalcaneal arthrodesis: A retrospective analysis. *Indian Journal of Orthopaedics*. 2015; 49(2):227-232
- Santos-Pinheiro F, Li Y. Eosinophilic Granulomatosis with Polyangiitis (Churg- Strauss Syndrome) Presenting with Polyneuropathy- A case series. *Journal of Clinical neuromuscular disease*. 2015; 16(3) 125-130
- Solis G, M.S Hennessy, Saxby T.S. Pes Cavus: a review. *Foot and Ankle Surgery*. 2000; 6(3) 145-153