Introduction

There is a paucity of literature describing the use of arthrodiastasis for surgical treatment in vascular necrosis of the lesser metatarsals. Arthrodiastasis is used in the setting of avascular necrosis of the hip, Legg-Calvé-Perthes disease (1). With similar concepts and paradigms, we would expect promising results (2).

Therefore, we explored the combination of surgical techniques that involved core decompression with autologous bone marrow aspirate concentrate (BMAC). In combination with BMAC, offloading harmful stresses to a compromised articular surface with external fixation allows one to maintain full weight bearing to the foot, while improving the synovial circulation to the joint. This study documents a patient with avascular necrosis of the lesser metatarsal heads treated successfully with core decompression, BMAC and multiple monlar external fixators.

Case Presentation

Forty-nine-year-old female with past medical history of diabetes mellitus type 1 with chronic nephropathy, psoriatic arthritis, hypothyroidism, case study documents a patient with avascular necrosis of the lesser metatarsal heads. Pain with ankle inversion and plantar flexion was present. The patient presented with a foot that was swollen and tender to touch along lateral/posterior ankle extending onto the malleoli. The patient had been treated as an outpatient clinic where a magnetic resonance imaging (MRI) was performed. The MRI showed decreased T1 signal intensity of the third metatarsal head. Contour of metatarsal heads acceptable. Plantar pain, no pain with ROM.

Methods, Results, etc.

- 7/8/20: Patient returned to clinic with return to functional baseline at 10 months. Patient had 0/10 pain at 3/15/18. Patient returned to clinic with return to functional baseline at 11/19/17. Patient returned to clinic with return to functional baseline at 3/8/18.

Results

Arthrodiastasis was performed at 10 weeks of external fixation application with return to functional baseline at 10 months. Patient had 0/10 pain at 3/15/18.

Discussion/Analysis

Arthrodiastasis is a surgical procedure that involves the removal of bone from the subchondral bone to create a fibrous repair of defects of articular cartilage and the preservation of the articular surface (5). This idea has been extrapolated to this case study to achieve symptomatic relief and earlier return to functional baseline. Though the surgical procedure of performing arthrodiastasis for AVN has been described, the efficacy of this procedure in long-term follow-up has not been extensively evaluated. To our knowledge, only one article in the literature mentions the use of arthrodiastasis for AVN of the lesser metatarsal heads (6). In the foot and ankle, arthrodiastasis is often used for treatment of arthritis of both the first metatarsophalangeal joint and ankle joint.

Arthrodiastasis has been shown to be beneficial in the management of AVN of the femoral head and is used as an alternative to core decompression and autologous bone marrow aspirate concentrate (BMAC). The advantage of performing arthrodiastasis for AVN is maintenance of joint motion and possibly prolonging the length of time before progression to hemarthrosis. Though the procedure is often used in the management of AVN of the femoral head, its efficacy in the management of AVN of the lesser metatarsal heads is uncertain. The use of arthrodiastasis in the management of AVN of the lesser metatarsal heads is not well described in the literature.

Conclusion

Our case study is limited to one patient. However, the results of the combination of procedures have shown in symptoms relief and earlier return to functional baseline. Though the surgical techniques could be limited to patients and pathologies specific, they should be applied to current AVN methodologies to explore different options. Case management should be essential in comparing core decompression with osteotomies and core decompression with joint distraction.

Acknowledgement

Thank you John Miller, DPM and Emily Cha, DPM for providing patient care.

References


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