

# MRI Findings after a Subchondroplasty Procedure of the Ankle: A Case Report



Michael E. Calderone DPM<sup>1</sup>, Mansi Patel DPM<sup>2</sup>, Matthew K. Brant DPM, FACFAS<sup>3</sup>

<sup>(1)</sup>Chief Foot and Ankle Surgery Resident, <sup>(2)</sup> Second Year Foot and Ankle Surgery Resident, Inspira Health Network

<sup>(3)</sup>Attending Physician, Reconstructive Orthopedics, Inspira Health Network, Vineland, NJ



## Introduction

Osteoarthritis (OA) is a common disease affecting 15% of the world's adult population with 4% of those suffering from OA in the ankle<sup>1</sup>. Often in patients who fail conservative treatment, the use of an MRI is necessary to identify the pathology. Bone marrow lesions (BMLs) seen on MRI have been recognized as a source of the ankle pain. Majority of the BMLs fluctuate in size over time and are seen as hyperintense lesions on MRI. We present MRI findings of a patient following arthroscopy with subchondroplasty.

## Case Study

A 71-year-old female with persistent left ankle pain and an AOFAS score of 70 failed numerous conservative treatment options. Preoperative MRI revealed a 10 x 7 mm lesion along the medial talar dome with extensive surrounding bone marrow edema. The decision was made for an arthroscopic debridement with subchondroplasty of the talar dome.

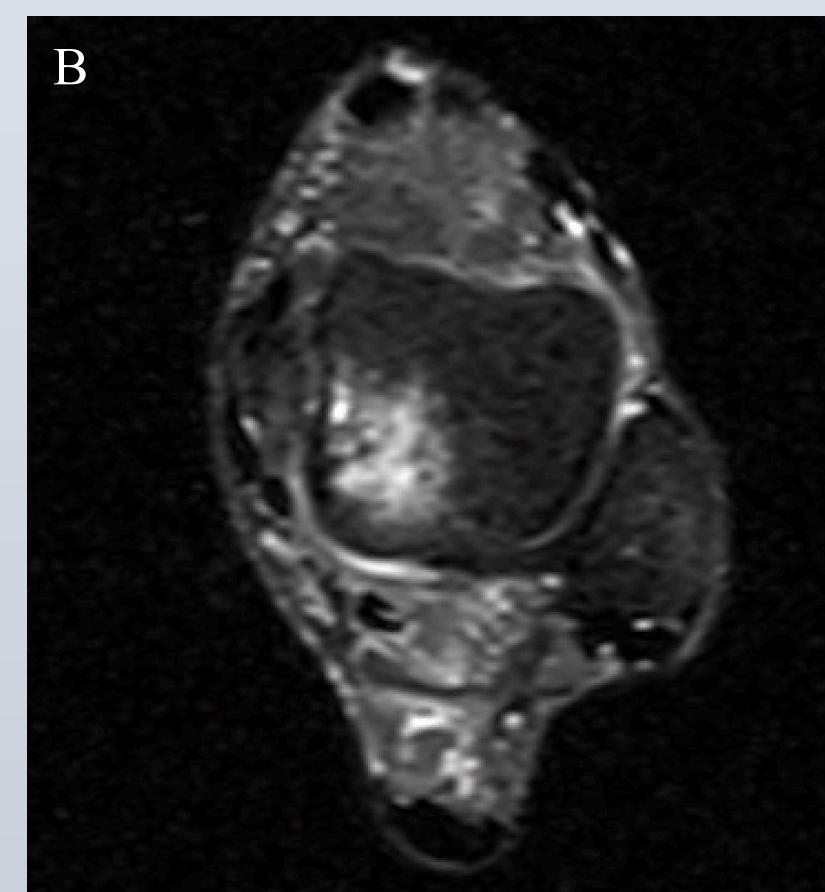
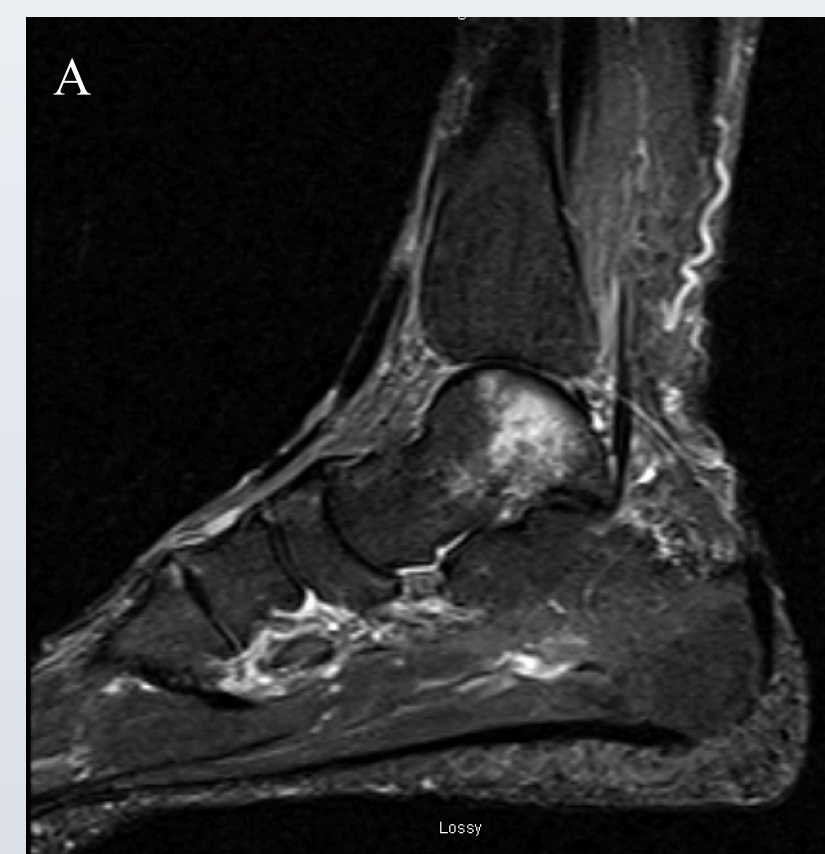
## Procedure

Arthroscopic evaluation revealed large amounts of synovitic tissue, which was debrided. Upon adequate debridement, subchondroplasty was then performed. A total of 2 mL of calcium phosphate was combined with 2.4 mL of blood. Under fluoroscopic guidance, the cannula was retrograde drilled to the talar lesion with direct visualization with the arthroscope and the mixture was then injected.

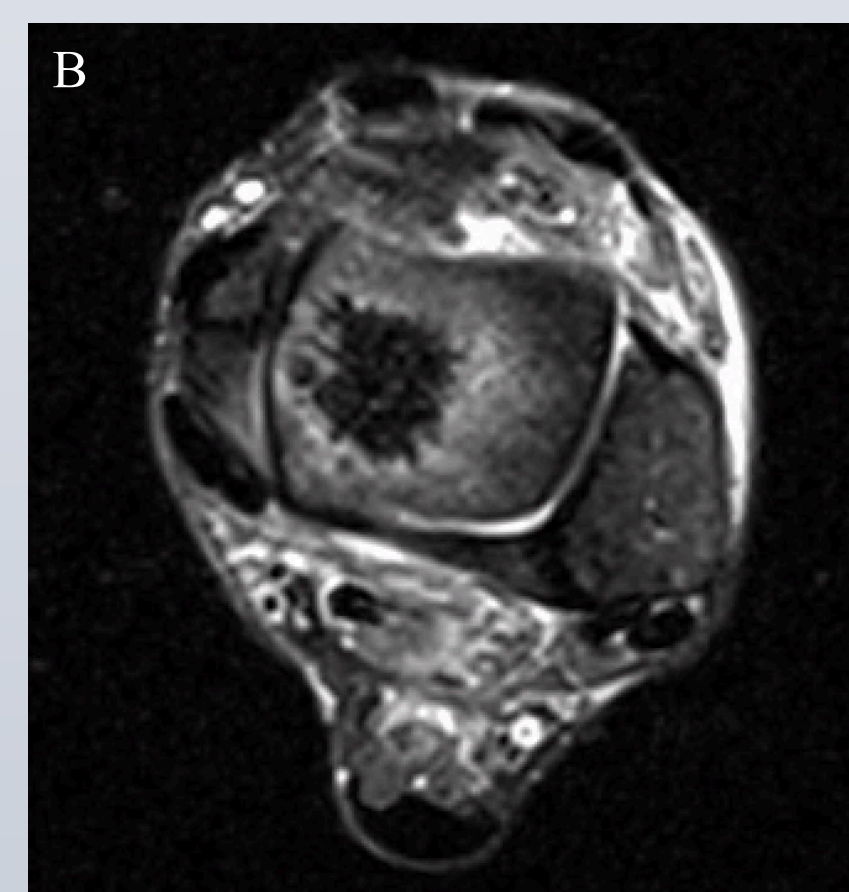
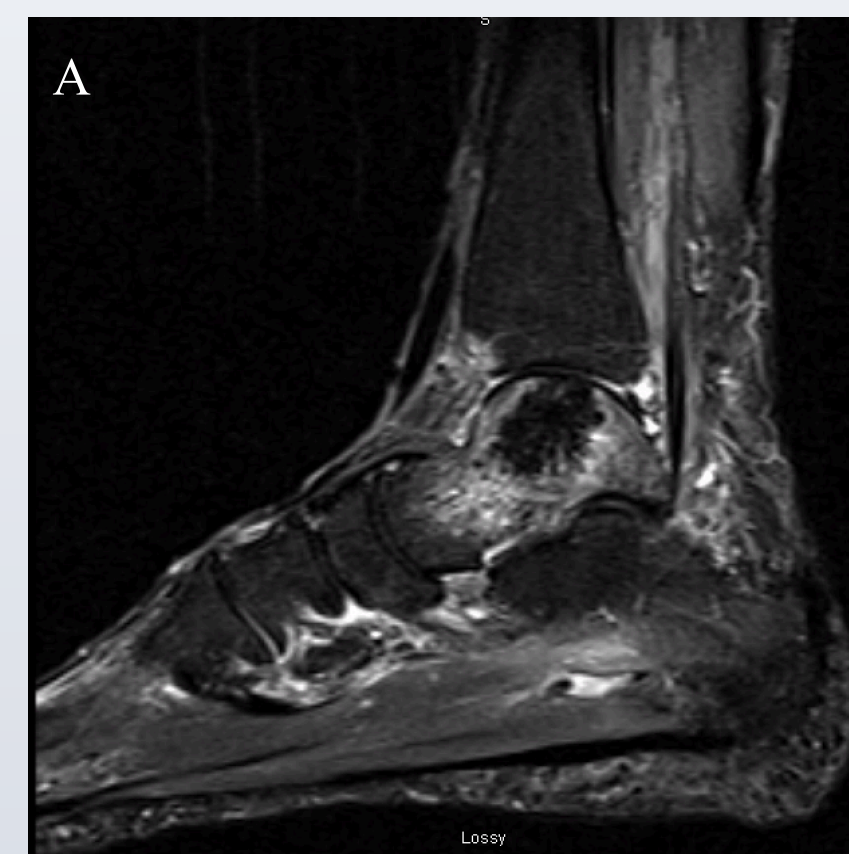
## Results

Serial MRI's performed after the initial subchondroplasty showed an increase in hypointensity centered within the medial talus and a gradual decrease in the surrounding bone marrow edema. Clinically, it also correlated with the patient's decrease in ankle pain with an increase in the patient's AOFAS score of 90 approximately 6 months after the procedure.

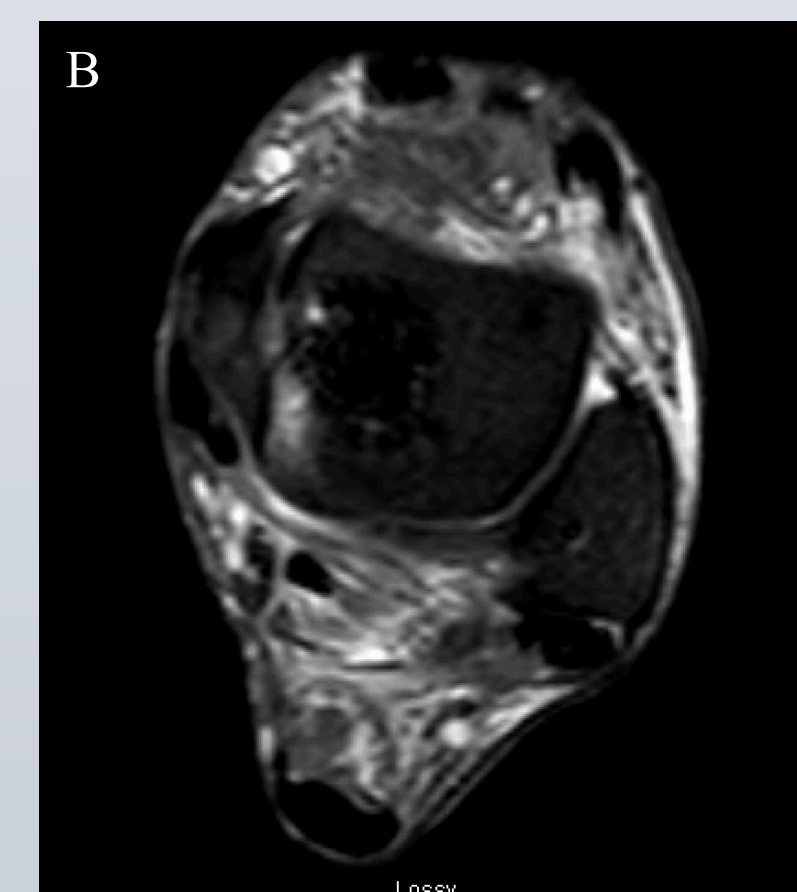
## Imaging



**Figure 1:** (A) Pre-operative T2 sagittal view (B) T2 Axial view showing 10 x 7 mm lesion along the medial talar dome with extensive surrounding bone marrow edema



**Figure 2:** (A) Sagittal STIR view s/p 1 month subchondroplasty (B) T2 axial view with new hypointense area centered within the talar dome measuring 1.7 cm x 1.7 cm x 1.8 cm



**Figure 3:** (A) Sagittal STIR view s/p 6 months subchondroplasty (B) T2 SPAIR axial view with a large hypointense area measuring 2.2 x 1.5 x 1.9 cm

## Analysis and Discussion

Ankle arthritis affects 4% of the world's arthritic population. Ankle OA is typically described by narrowing of the tibio-talar joint space and loss of articular cartilage. However, it has been shown that the degree of joint space narrowing poorly correlates with the incidence and severity of the pain<sup>2</sup>. Bone marrow lesions (BMLs), which are a common but nonspecific finding on MRI, on the contrary, have been well documented to correlate with pain in OA<sup>3</sup>. Symptomatic BMLs can be identified on MRI and subchondroplasty is a viable and proven option to treat them. The progression of pathologic subchondral bone to healthy, cancellous native bone can be visualized on post-procedure MRIs.

## References

- 1) Miller, Jason R., and Karl W. Dunn. "Subchondroplasty of the Ankle: A Novel Technique." *Subchondroplasty of the Ankle: A Novel Technique*, vol. 8, no. 1, ser. 7, 2015. 7.
- 2) Nevalainen, Mika T., et al. "MRI Findings of Subchondroplasty of the Knee: a Two-Case Report." *Clinical Imaging*, vol. 40, no. 2, 2016, pp. 241–243., doi: 10.1016/j.clinimag.2015.11.015.
- 3) Sharkey, Peter, and Steven Cohen. "Subchondroplasty for Treating Bone Marrow Lesions." *The Journal of Knee Surgery*, vol. 29, no. 07, July 2015, pp. 555–563., doi:10.1055/s-0035-1568988.
- 4) Agten, Christoph A., et al. "Subchondroplasty: What the Radiologist Needs to Know." *American Journal of Roentgenology*, vol. 207, no. 6, 2016, pp. 1257–1262., doi:10.2214/ajr.16.16521.
- 5) Astur, Diego Costa, et al. "Evaluation and Management of Subchondral Calcium Phosphate Injection Technique to Treat Bone Marrow Lesion." *Cartilage*, 2018, p. 194760351877024., doi: 10.1177/1947603518770249.
- 6) Yoo, Joanne Y., et al. "Knee Arthroplasty After Subchondroplasty: Early Results, Complications, and Technical Challenges." *The Journal of Arthroplasty*, vol. 31, no. 10, 2016, pp. 2188–2192., doi:10.1016/j.arth.2015.12.051.