Imaging of Common Arthroscopic Pathology of the Ankle

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KEYWORDS

• Anterolateral ankle impingement • Anteromedial ankle impingement • Os trigonum
• Osteochondral lesion talus

KEY POINTS

- CT scan may be more beneficial in prognosis of osteochondral lesions.
- MRI seems to be the gold standard for imaging of impingement syndromes.
- Inflammation of the flexor hallucis longus tendon on MRI does not indicate os trigonum syndrome.

INTRODUCTION

Arthroscopy of the ankle is used in the treatment and diagnosis of a spectrum of intra-articular pathology, such as soft tissue and osseous impingement, osteochondral lesions, arthrofibrosis, and synovitis. To help identify the correct pathology, imaging techniques are often used to aid the surgeon in diagnosing pathology and determining best treatment options.

ANTEROLATERAL ANKLE IMPINGEMENT

Routine radiographs may show spurring along the anterior ankle joint line on the lateral view, but this view cannot confirm exact location of the spur. Gold standard imaging is an MRI. However, controversy occurs as to how accurate MRI is for the identification of impingement syndrome. Ferkel and colleagues[1] studied 31 patients with more than 2 years of follow-up who had chronic anterolateral ankle pain following inversion injury. All had failed to respond to at least 2 months of conservative treatment and had negative stress radiographs to rule out instability. On physical examination, tenderness was localized to the anterolateral corner of the talar dome. MRI was the most useful diagnostic screening test, showing synovial thickening consistent with impingement in the anterolateral gutter.

Liu and colleagues[2] reviewed 22 patients who had arthroscopic evaluations and preoperative MRI studies of their ankles because of chronic anterolateral ankle pain

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after sprains. They tested the ability of surgeons to use the initial clinical examination to predict arthroscopically confirmed anterolateral ankle impingement compared with the ability to predict this condition using preoperative MRI. The patient population consisted of 15 men and 7 women who had an average age of 28 years. Five patients (23%) were intercollegiate athletes and 17 patients (77%) were recreational athletes. All patients reported previous trauma to the involved ankles, and all were seen with chronic ankle pain. Clinical examinations were used to assess ankle pain, swelling, range of motion, and stability. Anterolateral ankle impingement was confirmed in 18 patients (82%) with arthroscopic examination. Clinical examinations had a sensitivity of 94% and a specificity of 75% for predicting impingement, and MRI had a sensitivity of 39% and a specificity of 50%. The results of this study suggest that preoperative MRI examination is not beneficial or cost-effective in the diagnosis of anterolateral ankle impingement; furthermore, its use may cause further delay in treatment.

The use of intravenous contrast has been presented to try and enhance the soft tissue impingement. Bagnolesi and colleagues[3] reported mild to moderate contrast enhancement of the abnormal synovium in 8 of 14 patients with synovial impingement lesions. In patients with a mature meniscoid lesion, the hyalinized fibrosis is avascular and may not enhance. This situation may account for a recent study that found indirect MRI arthrography to be less accurate than conventional MRI of the ankle for diagnosis of impingement lesions.[4]

There have been several reports on the use of ultrasound to assess anterolateral ankle impingement. Cochet and colleagues[5] proposed ultrasound diagnostic criteria for synovial thickening along the anterolateral gutter of the ankle. Using these criteria, sensitivity, specificity, and accuracy of sonography in the diagnosis of anterolateral ankle impingement were 76%, 57%, and 73%, respectively. McCarthy and coworkers[6] described 10 patients with anterolateral impingement who had posttraumatic synovitis detected at ultrasound and later confirmed with arthroscopy. Hyperemia was not shown in the area of synovial thickening in any of their 10 patients. The investigators proposed a 10-mm cutoff size for the synovial thickening and the presence of anterolateral impingement symptoms.[6]

In anterolateral soft tissue impingement, MRI may show posttraumatic synovitis within the anterolateral gutter, which manifests as filiform intermediate signal intensity foci on proton density-weighted and fat-suppressed proton density-weighted or T2-weighted MRI sequences (**Fig. 1**).

Evaluation of the adjacent anterior talofibular and anterior-inferior tibiofibular ligaments can assess for evidence of previous injury. As the synovitis becomes more organized and undergoes hyalinized fibrosis, it appears confluent and progressively decreases in signal intensity. After arthroscopy, postsurgical scarring of the anterior lateral gutter capsule can mimic a meniscoid lesion on MRI. Clinically, however, this scarring is rarely symptomatic. Arthrofibrosis is visualized as anterior capsular thickening (>3 mm), which may be of intermediate signal on proton density-weighted MRI in the early phase, and become progressively lower in signal intensity over time. This shows up as a dense gray tissue on T1-weighted images (**Fig. 2**). In the early stages, there may be adjacent bone marrow edema in the anterior margin of the tibial plafond at the insertion of the anterior capsule.[7–9]

ANTEROMEDIAL ANKLE IMPINGEMENT

Anteromedial impingement spurs are best shown on an oblique radiograph of the foot. This projection involves a 45° craniocaudal angulation of the radiograph tube, with the leg positioned in 30° of external rotation.[10] Ultrasonography may show synovitis, scar,