

Prevalence of Posterolateral Ankle Impingement Lesions in Patients Undergoing Operative Arthroscopy for Lateral Ankle Instability

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STATEMENT OF PURPOSE

Magnetic Resonance Imaging (MRI) is the diagnostic imaging modality of choice for ankle soft tissue pathology including lateral ankle ligament damage, impingement, synovitis, joint effusion, osteochondral lesion, and subchondral edema. Several studies have examined the diagnostic utility of MRI in detecting these pathologies. Liu and colleagues found that MRI was 50% specific and 39% sensitive for detecting anterolateral ankle impingement (1). Joshy et al. reported sensitivities of 67% for ATFL tears, 40% for CFL tears, and 73% for OCD and 100% specificity for all three (2). The major limitation of these studies is their small sample size, 22 and 24 patients, respectively. In a larger study involving 40 patients by Mintz et al., MRI yielded a specificity of 100% and sensitivity of 95% when detecting talar OCDs (3).

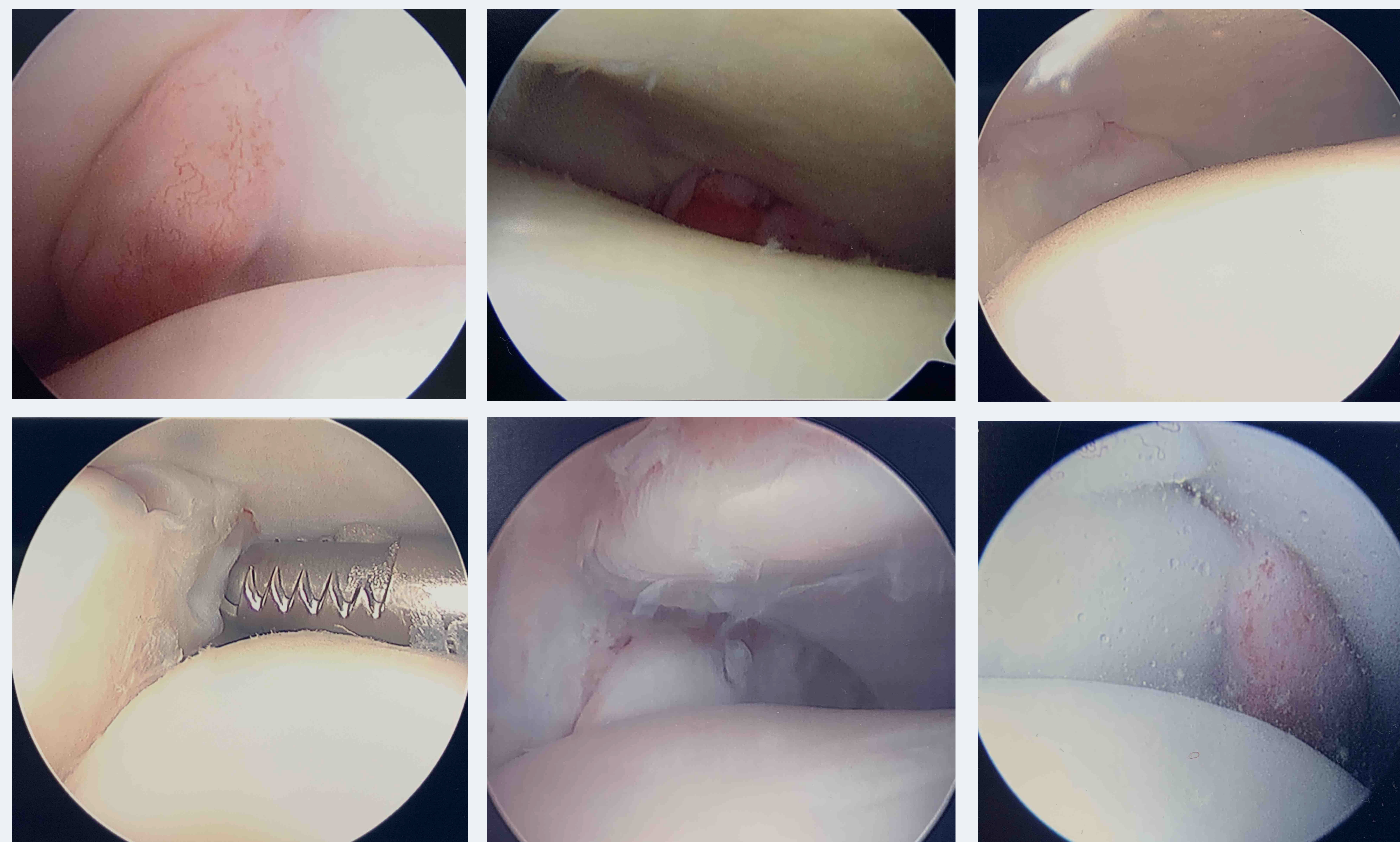
Posterolateral impingement lesions (**Figure 1**) have not been previously defined. Furthermore, the ability of MRI to correctly diagnose posterolateral ankle impingement lesions has been overlooked by recent literature. Impingement lesions are common in patients with lateral ankle instability, thus, the topic deserves further research.

This study analyzes the prevalence of impingement lesions, OCDs, and lateral ankle ligament pathology in patients treated for lateral ankle instability with operative arthroscopy. We aimed to compare how often these lesions were detected on preoperative MRI with how often they were detected with arthroscopy. We calculated MRI's sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) in the detection of impingement lesions, OCDs, and lateral ankle ligament pathology. Our study is the most robust to date with a sample size of 110 consecutive surgeries.

METHODOLOGY

A retrospective review was conducted on consecutive ankle arthroscopic procedures performed by a single surgeon (BLC) from January 2017 through July 2019. All patients studied had a preoperative diagnosis of lateral ankle instability. Patients undergoing ankle arthroscopy for evaluation of posttraumatic arthritis at the time of ankle fracture hardware removal were excluded. Patients' gender, age at the time of surgery, preoperative diagnoses, MRI findings, and intraoperative findings were recorded. These were used to calculate the sensitivity, specificity, negative predictive value (NPV), and positive predictive value (PPV) of MRI in detecting intra-operative impingement lesions, OCD, and lateral ankle ligament pathology. The prevalence of impingement lesions located in the posterior lateral quadrant was also determined.

Figure 1. Posterolateral Impingement Lesions Viewed Arthroscopically



Several arthroscopic images of posterolateral impingement lesions are shown above. While some surgeons find it unnecessary, utilization of an ankle distractor is important because it affords the ability to easily visualize the posterior aspect of the ankle joint. Without direct visualization of this area, impingement lesions in the posterolateral aspect of the joint may go undetected which could lead to lasting impingement, ongoing pain, and even repeat surgery.

PROCEDURE

Procedures included intraoperative arthroscopy performed through standard anterior-lateral and anterior-medial portals in all patients. All ankles were evaluated utilizing Ferkel's 21-point arthroscopic exam. The operative technique also involved use of an ankle distractor in all cases.

RESULTS

107 patients (34 males and 73 females) met the inclusion criteria. A total of 110 surgeries were performed on 109 feet (54 left and 55 right). The average age at the time of surgery was 45.1 ± 17.2 years (range 13-76). All patients had a preoperative diagnosis of lateral ankle instability. 100/110 (90.9%) showed arthroscopic impingement lesions. 44/100 (44.0%) impingement lesions were located in the posterolateral quadrant of the ankle joint. MRI detected a posterolateral impingement lesion in 0/44 cases (0.0%). MRI was 92.2% specific and 45.5% sensitive in the detection of OCDs and was 50.0% specific and 62.2% sensitive in detecting lateral ankle ligament instability. The PPV of MRI in detecting OCD lesions was 66.7% and the NPV was 83.1%. The PPV of MRI in detecting lateral ankle ligament pathology was 98.1% and the NPV was 5.88%. (**Table 1**)

Table 1. Statistical Results

	Osteochondral Defect (OCD)	Lateral Ankle Ligament Pathology	Posterolateral Impingement Lesions
Specificity	92.2%	50.0%	0.0%
Sensitivity	45.5%	62.2%	0.0%
Positive Predictive Value (PPV)	66.7%	98.1%	0.0%
Negative Predictive Value (NPV)	83.1%	5.88%	0.0%

ANALYSIS & DISCUSSION

Impingement lesions are common in patients with lateral ankle instability. This was re-demonstrated by the present study, as 90.9% of operative reports evaluated were positive for presence of an impingement lesion. Nearly half of these (44.0%) were located in the posterolateral quadrant of the ankle joint and none of them (0.0%) were detected on preoperative MRI. This calls attention to the need for full evaluation of all aspects of the joint including the posterior aspect with debridement of impinging lesions whenever necessary. Utilization of an ankle distractor is crucial to the surgeon's ability to visualize the posterior structures of the ankle joint. Many foot and ankle surgeons do not find ankle distractors necessary; however, the benefit lies within easy visualization of the posterolateral aspect of the joint, exposing posterolateral impingement lesions that would otherwise be missed. Failing to identify and debride these lesions may lead to lasting impingement, ongoing pain, and even repeat surgery.

This study reproduced sensitivity and specificity values similar to previously published literature. Standard MRI accurately detected 10/22 OCDs (45.5%) and 51/82 instances of lateral ankle ligament pathology (62.2%). Negative results cannot confidently rule-out pathology so a negative MRI should be viewed with caution in symptomatic patients. Contrast enhancement, fat suppression, and three-dimensional MRI may improve accuracy but only anterolateral impingement syndrome was studied (4). Direct visualization with arthroscopy is often necessary to reach a definitive diagnosis and for treatment of several common pathologies.

Data from this large patient population suggests that MRI can be a useful diagnostic tool but may not be a necessary part of the preoperative workup for symptomatic lateral ankle instability prior to planned arthroscopy. The study also calls attention to the importance of evaluating the posterolateral aspect of the ankle joint as posterolateral ankle impingement lesions are common and have never been previously described.

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