

# **Arthroscopic Treatment of Anterior Ankle Impingement Syndrome**

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The etiology of anterior ankle impingement syndrome remains a debated topic within the literature as I will demonstrate here. However, when combining clinical evaluation and dedicated radiologic projections, a physicians' ability to diagnose this troublesome pathology no longer becomes elusive. Numerous authors have reported excellent results in terms of patient satisfaction, functional scores, and improved ankle range of motion with arthroscopic debridement. Yet prognostic classification systems dedicated to size and location of osseous or soft-tissue lesion are still lacking within the literature. Nonetheless, complication rates following ankle arthroscopy for anterior ankle impingement are low, and these patients warrant surgical intervention when conservative measures fail.

Ankle impingement syndrome is often seen in many different types of foot and ankle practices. It has been classically described as "athletes ankle" or "footballer's ankle" due to its presentation in competitors participating in sports such as soccer, football, ballet, and running.<sup>1,2</sup> Patients will typically present with chronic anteromedial or anterolateral ankle pain while running, kicking, or even climbing stairs. The origin of their discomfort can either be soft tissue and/or osseous in nature and warrants further investigation.

Surgical treatment has advanced from open ankle arthrotomy to a more minimally invasive approach via ankle arthroscopy when appropriate.<sup>3,4</sup> Whenever possible, the senior author (Michael Troiano DPM) takes advantage of advanced ankle arthroscopic techniques due to the wave of literature that supports this approach.

## **EVALUATING ANKLE IMPINGEMENT SYNDROME**

### ***Patient History***

- As with any ankle pathology, a thorough patient history and physical exam is important.
- Patients will often describe chronic anterior ankle pain and moderate swelling after activity.<sup>5</sup>
- When performing a physical exam, physicians will often notice the ankle limited at the "end range" of active and passive dorsiflexion and internal and external rotation.
- It is especially important to evaluate for any signs of a talar dome lesion as these can potentially exacerbate the patients symptomology.
- Additionally, patients may report a remote history of an acute inversion ankle sprain or have signs of functional or structural instability.<sup>6</sup>
- It has been reported in the literature that bony impingement is more commonly found over the anteromedial ankle while anterolateral impingement is often of soft-tissue origin.

### ***Imaging***

- Anterior bony ankle impingement can be evaluated with conventional lateral weight-bearing X-rays.
- You can further evaluate anteromedial osseous impingement with a special oblique view where the beam is aimed 45<sup>0</sup> craniocaudally with the leg externally rotated 30<sup>0</sup>.<sup>12</sup>
- The oblique anteromedial impingement view when combined with the standard lateral weight-bearing view has been noted to increase sensitivity in detecting osteophytes up to 85 percent noted on the tibia and 73 percent noted on the talus.<sup>13</sup>
- Ultrasound is another imaging technique used for anterior ankle impingement and helps differentiate the disease process as osseous or soft tissue in origin.
- It has been reported in the literature that synovitic lesions larger than 10mm are associated with impingement symptoms.<sup>14</sup>

- In my experience, CT scans help delineate osseous abnormalities. However, this is not my preferred cross-sectional imaging study in this subset of patients.
- Conventional MRI allows further evaluation of ankle ligaments, bone edema, tenosynovitis, joint effusion, thickened synovium, and concomitant chondral injury.
- Although MRI has been shown to have a sensitivity of 75–83 percent and specificity of 75–100 percent in detecting anterolateral impingement, a negative MRI does not exclude intra-articular pathology.<sup>15</sup>

## **CAUSES OF ANKLE IMPINGEMENT SYNDROME**

Ankle impingement syndrome has multiple osseous and soft-tissue anatomic abnormalities that are thought to contribute to this pathology. Morris theorized that the cause of boney impingement was due to repetitive traction on the anterior joint capsule during an extreme plantar flexion force, leading to subsequent exostosis formation.

Following further anatomic studies and arthroscopic evaluation, this hypothesis was deemed not plausible. Studies showed that when performing ankle arthroscopy on anterior boney impingement, the osteophytes were found within the confines of the anterior joint capsule and were not noted to be at the more proximal attachment of the joint capsule.<sup>7,8</sup>

In approximately 2 percent of cases, acute ankle sprains have also been reported to lead to anterior ankle impingement.<sup>9</sup> A supination type injury will occur to the anterior talofibular ligament (ATFL) with many of these patients initially dismissing this event as minor. In these patients, synovial tissue organizes into a meniscoid hyalinized mass leading to chronic inflammation and recurrent joint-line tenderness. Additionally, the thickened distal fascicle of the anterior inferior tibiofibular ligament (AITFL), often referred to as Bassett's ligament, has been thought a cause of anterolateral soft-tissue impingement.<sup>10</sup>

Other mechanical factors such as recurrent micro-trauma also play a role in anterior ankle impingement. It has been theorized that repetitive impaction injury to the anterior chondral margin of the tibiotalar joint leads to attempted repair with fibrosis. Eventually, fibrocartilage proliferation takes over resulting in the formation of osteophytes.<sup>2,11</sup>

Anterior osteophytes have been proposed to limit the space available for the native anterior synovial fold and therefore exacerbate these entrapment symptoms. Histopathologic analysis procured following ankle arthroscopy has shown synovial tissue with chronic inflammation.

## **TREATMENTS USED FOR ANKLE IMPINGEMENT SYNDROME**

### ***Conservative***

- Non-operative treatment of anterior osseous and/or soft-tissue impingement can be treated with rest, ankle bracing, shoe modification, orthotics, local steroid injections, and physical therapy to varying degrees of success.
- Non-operative management is always recommended as a first line treatment option for my patients.
- When patients continue to present with edema, limitation of motion, and joint-line tenderness, surgical intervention should be considered.

### ***Surgical***

- Surgical goals are to remove osteophytes and pathologic soft-tissue structures to restore anatomic motion of the tibiotalar joint.
- Surgical intervention has been proposed over the years by way of either an open ankle arthrotomy or more commonly by an ankle arthroscopic approach.
- The literature has shown that arthroscopic techniques have resulted in faster return to full activity compared to an open arthrotomy and is my preferred technique.<sup>16</sup>

- The main classification system I have found useful is the Van Dijk classification based on appearance of osteophytes and joint space narrowing of the ankle evaluated with radiographs.
- Following arthroscopic bony spur removal, patient satisfaction was excellent or good in 77 percent of patients who initially had a lower grade osteoarthritic change of the tibiotalar joint.<sup>17</sup>

## MY PROCEDURE FOR TREATMENT

1. In my practice, I generally approach these patients from an arthroscopic technique, using anteromedial and anterolateral portals with a 4.0 mm 30° scope.
2. I classically begin with a standard Ferkel 21-point diagnostic evaluation.
3. Following diagnostic evaluation, I introduce a 3.5mm oscillating shaver and debride the anterior joint capsule while simultaneously taking the tibiotalar joint through range of motion.
4. Although an electrothermal device has been described for soft-tissue debridement within the ankle joint, I do not generally use this technique.
5. Following my soft-tissue debridement, I evaluate any osseous spur formation on the tibia and talus and resect this with a burr or small osteotomy when appropriate.
6. Following standard portal closure, my patients are placed in a nonweight-bearing, short-leg posterior splint for two weeks.
7. After suture removal, patients will transition to a CAM walker boot for another two weeks.
8. At this point, physical therapy is initiated for range-of-motion exercises and edema reduction with a progressive increase of activity as tolerated.

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