CHAPTER **20**

PRESENCE OF BASSETT'S LESION IN ANTERIOR AND LATERAL ANKLE PATHOLOGY

Gordon W. Patton, DPM
Nicholas A. Giovinco, DPM

The ankle joint complex is arguably one of the most unique articulations in human nature. Understanding its natural function in the foot has proven to be both challenging and disputable in literature. The associated pathology of the articular and surrounding capsuloligamentous anatomy has been continually studied and a variety of pathologies are attributable to the ankle joint complex (1). Traumatic and degenerative ankle conditions often demonstrate overlapping and even progressive involvement of the anatomic structures of the ankle joint complex, which can make a specific diagnosis difficult to procure.

The presence and participation of the anterior inferior tibiofibular ligament (AITFL) in tibiotalar and high ankle pathology of the syndesmosis is less understood (2). Bassett et al have introduced the concept, that a distinct body of this ligament is responsible for this condition (3). In current discussions, this additional component is commonly referred to as Bassett's ligament.

By definition, the AITFL participates in the syndesmotic architecture of the ankle, and is accompanied by the posterior inferior tibiofibular ligament (PITFL) and the tibofibular interosseous ligament (TFIL). Draves et al describe both the AITFL and PITFL as being oriented in an inferior lateral direction (4). The PITFL is said to have a deep component, which is otherwise referred to as the transverse ligament, while the AITFL is not mentioned as having a separate or accessory component. The TFIL is also said to make the strongest ligamentous contribution to the syndesmosis. Together these structures govern the fibula as it moves superiorly and inferiorly about the tibia during dorsiflexion and plantarflexion respectively. Sarrafian et al discussed the AITFL in further detail. Describing this flat, fibrous lamina, which originates from the longitudinal tubercle of the fibula and inserts on the anterolateral tubercle of the tibia, as a potentially multifascicular structure with 2, and sometimes even 3, fibrous bands (5).

Recent investigations of the AITFL have attempted to define, not just the true form of this accessory element in both normal and pathological conditions, but even its prevalence in the average population (6, 7). In a cadaveric study conducted by Bassett et al, a separate distal fascicle was observed in 10 or 11 specimens and thus was considered a normal finding in the general population, with pathological potential (3). As talar dorsiflexion occurs within the mortise, contact with this distal fascicle becomes increasingly likely. In a study by Akseki et al, the results were similar, demonstrating the presence of a separate distal fascicle in 83% of the specimens (8). Separated by a fibrofatty tissue, this fascicle was observed to run from the anterolateral corner of the distal tibia, and insert just proximal to the anterior talofibular ligament (ATFL).

The AITFL's anatomical profile, as the primary causation of anterolateral impingement has been challenged by other authors, including Ray and Kriz. A separate fascicle was observed in only 22% of their specimens, and thus Ray and Kriz proposed that the anatomical structure of the anterolateral talar dome may have more to do with this phenomenon. The beveling or triangulation of the talar dome is suspected to have the capability to increase the impinging mechanisms thereof (9).

Although several imaging studies have been conducted on anterior and anterolateral ankle impingements, very few mentions of the AITFL exist outside of arthroscopic literature. Robinson et al reported 100% success with the use of arthrography techniques when assessing the AITFL in normal and nonpathologic ankles, and thus concluded arthrograhy to be a useful tool in the diagnostic arsenal (10). A recent study by Subhas et al, utilized magnetic resonance imaging data retrospectively to compare arthroscopically confirmed Bassett's ligament pathology with preexisting MRIs (11). In this, they found the presence of an accessory ligament in 89% of their specimens. Length, width, and thickness were studied and large size was correlated with impinging symptoms and taller cartilage abrasion when compared with arthroscopic findings.

It is believed that a more distal insertion of the AITFL will result in a higher degree of contact with the talar dome and an increased potential for impingement. This finding is associated with cartilaginous degeneration and abrasion, as noted by Akseki et al (8, 12).

Despite arguments over its prevalence as a normal variant, impingements of the ankle are a somewhat well accepted phenomena. Originally describing them as “meniscoid mass,” Wolin compared these findings with that of a torn or inflamed meniscus in the knee (13). Since then, much discussion has taken place in literature and the varying pathogenic mechanisms are more intricately detailed (14).

The signs and symptoms of an ankle impingements were attributed as an athlete’s ankle by Morris in 1943, and later became known as footballer’s ankle by McMurray in 1950 (15, 16). A finding that is often seen with ankle impingements is osteophytic proliferation. The composition of these bodies can be a mixture of boney and/or fibrocartilagenous material and are suspected to arise from a variety of mechanisms. These include, but are not limited to distractive soft tissue attachments, compressive jamming within the joint, inflammation, repetitive or traumatic insult, and degenerative joint disease (17).

Given the nature of these pathogenic mechanisms, the development of Bassett’s ligament pathology is less often attributed to natural causes. It is more likely correlated with sporting and high impact activity. These activities have a great potential for both acute events as well as repetitive insults, which subsequently lead to symptomatic ankle conditions (18-20).

These mechanical actions, which increase the likelihood of AITFL impingement, are also responsible for many of the injuries at large (21). Pronatory, supinatory, and rotational actions often correlate with lateral ankle and syndesmotic sprains, as well as anterior impingements of the talocrural joint. Bassett’s ligament, is uniquely located at an overlapping crossroads of these three regions, as it sits just anterior to the “island of three.” Given this, the concomitance of a Bassett’s ligament pathology with other mentioned conditions may be practically explained. What is somewhat less appreciated is the diagnosis of Bassett’s ligament pathology and, to an even lesser degree, the subsequent treatment.

Lateral ankle and syndesmotic sprains have been extensively studied in the literature and are highly attributed to activities where physical contact, extremes in dorsiflexion or plantarflexion, jumping, and squatting are performed in close proximity to other participants. Inherently, the total damage received by the patient during these events is often difficult to accurately assess in its entirety. After examining the surroundings structures, pathology of the Bassett’s ligament would prove elusive and somewhat nonspecific (1). Although range of motion and squeeze tests are useful in diagnosing lateral and syndesmotic injuries, assessment through palpation must still be investigated further in order to discern synovial impingement from AITFL entrapment (1, 22).

Direct evidence of Bassett’s pathology is not present on plain film radiographs, however, the appreciation of concomitant injury can still be made. Stress views and frank evidence of syndesmotic diastasis has been well described in literature (23, 24). However chronic and supposedly less severe syndesmotic insult can result in heterotopic ossification of the interosseus membrane (25). This finding, can sometimes arise with lingering symptomatology, or may even be present after symptoms have improved (3). Computed tomography is useful in ruling out fracture of bones. Although it does not depict the AITFL itself, fibrocartilagenous osteophytes, loose bodies, or boney fragments, and general osseous archetecture may be visualized in association (26).

Magnetic resonance imaging (MRI) as a useful diagnostic modality has been debated in literature (27-30). Several recent studies have produced supporting evidence of MRI as a useful diagnostic tool for the presence and relative size of the AITFL as well as separate fascicles. Coronal views aimed obliquely in parallel with the ligament’s natural assumed direction have provided best results when viewed under spin-density weighted specifications (11). Arthrography, although less discussed, has convincing results of its usefulness in elucidation of adhesions or constrictions within the ankle joint and syndesmotic architecture (10, 26).

Technesium and positron emission scans of a Bassett’s ligament have not been discussed directly in the literature. However, no evidence of technesium as a useful prognostic marker for healing of diastatic injuries currently exists (31). Albeit impractical by modern standards, the use of PET scans could be practical for depicting evidence of inflammatory activity.

Diagnostic sonography has been well discussed in the literature. Although the current diagnostic potential is somewhat speculative, sonographic utility does merit further investigation (32). Given the sophistication and decreased cost of such equipment, it is possible that this could demonstrate usefulness as a less expensive alternative to MRI.

Conservative treatment of a pathological Bassett’s ligament is identical to most accepted options for addressing syndesmotic injuries, for all practical means. If recurrence of symptomatic ankle pain is not resolved from increased flexibility and strengthening, then proprioceptive training or even lateral ankle restabilization procedures may be in order (33).

In the absence of ostophytic proliferation or recurrent ankle sprains and instability, lingering symptoms and nonspecific descriptions of pain could indicate AITFL involvement. When treating a pathological Bassett's ligament, arthrography and arthroscopy have demonstrated quality results (34). Although syndesmotic sprains typically require longer recovery and healing times than lateral ankle sprains, relief of an entrapped AITFL is generally associated with substantial relief of pain when ambulatory status is reattained postoperatively. If left untreated, AITFL impingement has been correlated with leading to talar cartilage abrasion and degeneration. Although this finding is often diagnosed at the time of arthroscopy, it lends evidence to support visualization and possible treatment of a potentially Bassett's ligament in all arthroscopic operations of the ankle.

Bassett's ligament is an anatomical variant found within an uncertain percentage of the average population. When pathologically altered or insulted, this structure can have painful and even damaging results to surrounding structures and significantly affect the patient's overall quality of life. Although rarely identified or addressed as an isolated condition, evidence is suggestive of Bassett's ligament being a largely under-diagnosed and under-treated condition of the human ankle.

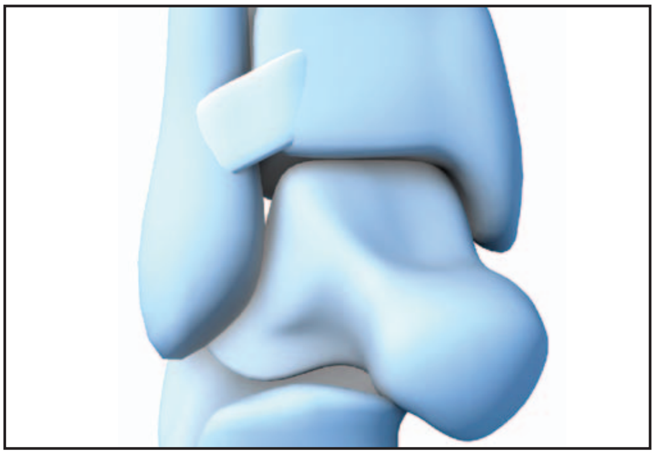

Figure 1A. A series depicting the variations of AITFL which demonstrates complete, separate, and multifascicular structure. Its distal insertion is noted as being at or just proximal to the ATFL.

Figure 1B.

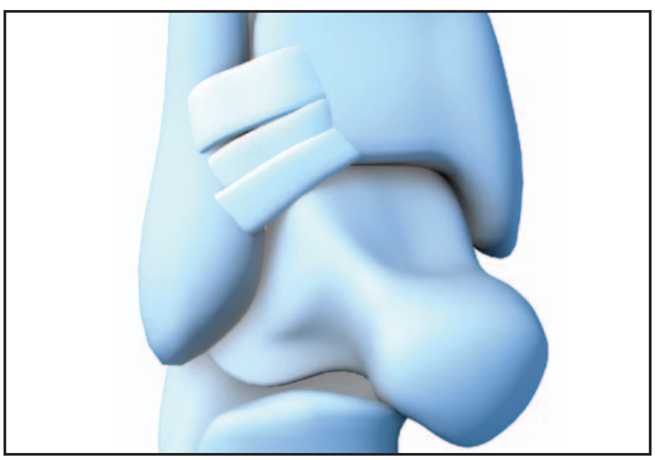

Figure 1C.

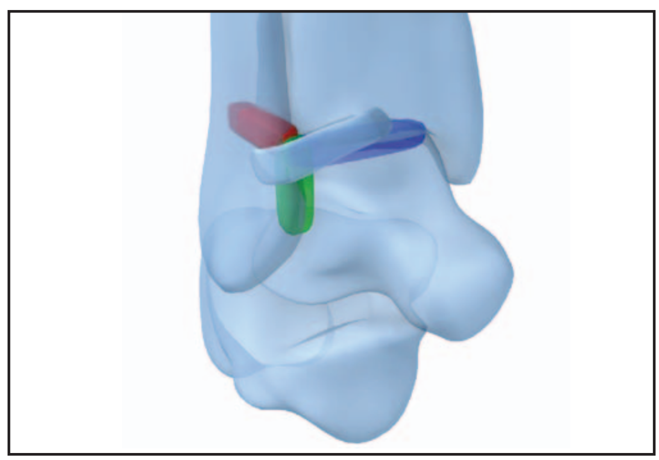

Figure 2. Anterior view of the ankle joint complex with Venn diagram overlay. This demonstrates how the location of Bassett's described ligament could be involved through proximal association with surrounding anatomical structures in ankle pathology.

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