

Ultrasound-Guided Aspiration and Steroid Injection for Postsurgical Ankle Stiffness and Pain

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1. Abstract

The ankle injury may involve periarticular tearing of ligaments and tendons, bone displacement, cortical damage, and fracture, all of which can result in joint stiffness and pain. While some of the more severe cases require surgical repair and physical therapy, it is not common practice to perform joint fluid aspiration and periarticular steroid injection. We presented a case of a patient with right ankle pain and equinus deformity undergoing ultrasound-guided aspiration and injection after receiving surgical fixation and post-operative physical therapy for 6 months.

2. Clinical Image

An ankle injury may involve bone displacement, cortical damage, and fracture, all of which may evolve into ankle joint arthritis. Periarticular tearing of ligaments and tendons may also accompany the injury. Trauma is the most common cause [1].

The main symptoms include pain and swelling in the affected ankle joint. Joint mobilities including dorsiflexion and plantarflexion are particularly limited. Image studies include a plain radiograph over the affected ankle joint to evaluate narrowing of the joint space, decreased cartilage volume, and osteophyte formation. Computed tomography or magnetic resonance imaging are the images of choice for a more detailed evaluation [2].

Conservative treatments include bracing, hydrotherapy, stretching

and mobilization of the affected ankle joint with medications, such as oral non-steroidal anti-inflammatory drugs, to improve joint mobility and pain. An Ultrasound-guided steroid injection into the joint space and the ligaments around the joint may be considered to aid traditional physical therapy. In a one-year follow-up study of 18 cases of ankle arthritis treated with ankle joint injection measured with the Foot and Ankle Outcome Score, intra-articular corticosteroids injection improved symptom scores in affected patients up to 1 year [2, 3].

We reported images from a case of postsurgical ankle stiffness in a 40-year-old man for right ankle pain and equinus deformity. The symptoms began 6 months ago, when he sustained severe ankle injury with talus fracture for which he received internal fixation. Despite post-operative physical therapy twice per week for 6 months, he had worsening ankle joint stiffness, persistent pain and swelling, which affected his ability to ambulate. Ultrasound examination was performed and there was significant hypoechoic change within the anterior ankle recess (AAR), suggesting accumulation of effusion (Figure 1). The transducer then delineated the tibialis anterior (TA) tendon and the anterior talofibular ligament (ATFL). Both appeared swollen, heterogenous with deranged fibrillary pattern. Under ultrasound guidance, yellowish clear, low viscosity fluid was aspirated from the right

AAR (Figure 2), followed by steroid injection to the right AAR as well as the right ATFL and TA tendon. In the next 3 months, he received two more similar courses of US-guided injection without aspiration, along with continuous rehabilitation programs. There was no more effusion in the right AAR (Figure 3). Both the right TA tendon and ATFL revealed normal echogenicity. His right ankle joint mobility gradually improved with decreased pain (Table 1/ Table 2). Six months after his initial visit, he was able to ambulate independently.

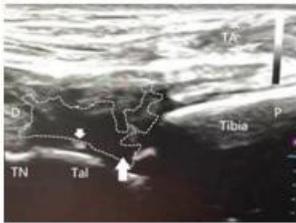


Figure 1: Ultrasonography-guided aspiration of joint effusion (Large arrow) and injection of anterior ankle recess through an in-plane approach during long axis image. D, distal. P, Proximal. TA, tendon of tibialis ante-rior. Tal, talus dome. TN, talus neck. Small arrow, needle tip.

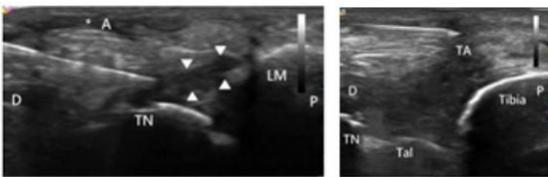


Figure 2: (A) Ultrasound-guided injection of anterior talofibular ligament (▲) (B) Peritendinous injection of tibialis anterior through an in-plane approach during long axis image. A (*), artery. LM, lateral malleolus. TN, talus neck. Tal, talus dome. P, proximal. D, Distal.



Figure 3: The US image revealed no more effusion in the right AAR on day 113 of the treatment. However, hypoechoogenicity persisted, suspected synovitis. TA, tendon of tibialis anterior. Tal, talus dome. TN, talus neck. P, proximal. D, Distal.

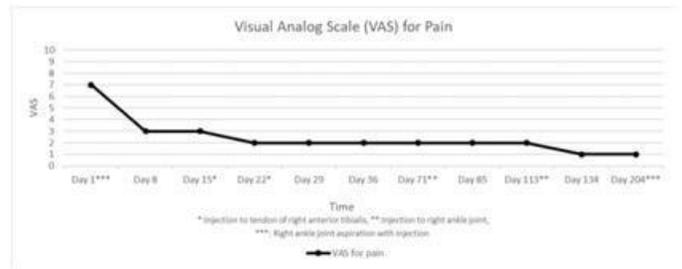


Table 2: Progression of VAS for pain after AAR aspiration and peritendinous injection.

Day 1, the first day of the treatment.

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Table 1: Progression of range of motion of right ankle after AAR aspiration and peritendinous injection.

Day 1, the first day of the treatment.