Educational Forum

The Clinical Experience of Musculoskeletal Ultrasound for Enthesitis in Seronegative Spondyloarthropathy

Wei-Jhe Hong¹, Kuo-Lung Lai^{2*}

¹Division of Rheumatology, Allergy and Immunology, Department of Internal Medicine, China Medical University Hospital, Taichung, Taiwan, ²Division of Allergy, Immunology and Rheumatology, Department of Internal Medicine, Taichung Veterans General Hospital, Taichung, Taiwan

Musculoskeletal ultrasound is a method to assess the morphology of joints and surrounding soft tissues. It well detects early signs (edema and thickening) and late changes (erosion and enthesophyte) in specific tissues. Musculoskeletal ultrasound also has the advantages of being relatively inexpensive, harmless to body, and easy to repeat procedure for following. Seronegative spondyloarthritis (SpA) is a general term for a large group of inflammatory arthritis-related diseases. It affects several organs, including spine, enthesis, joint, skin, eye, and gastrointestinal tract. SpA clinically covers ankylosing spondylitis, psoriatic arthritis, reactive arthritis, inflammatory bowel disease-associated arthritis, and undifferentiated spondyloarthritis. According to the standards established by the International Association for the ASsessment in Ankylosing Spondylitis (ASAS), SpA patients can be divided into two categories: axial SpA that affects the spine and iliac-sacral joints and peripheral SpA. The clinical manifestations of peripheral SpA include peripheral arthritis, enthesopathy, and dactylitis. Enthesopathy occurs at the junction of tendon and bone and is an important and common manifestation of SpA.

The tissue types of enthesis can be divided into fibrocartilaginous and dense fibrous connective tissue. Enthesopathy associated with SpA occurs at the fibrocartilage attachment. However, it is often difficult to make an accurate diagnosis of enthesopathy with a general clinical evaluation. For this reason, several ultrasound scoring systems for enthesopathy had been proposed over the past years, to standardize the assessment of enthesis, improve the accuracy of diagnosis, and improve the diagnostic accuracy in early SpA. In literature review, Lehtinen *et al.*^[1] first described the ultrasonic changes of the enthesopathy in patients with SpA in 1994. Afterward, Balint *et al.*^[2] made relevant records again in 2002. Both scholars documented the grayscale changes of enthesopathy

Received: 04-07-2021 Accepted: 27-07-2021 Available Online: 15-12-2021

Access this article online				
Quick Response Code:	Website: www.jmuonline.org			
	DOI: 10.4103/jmu.jmu_149_21			

in lower limbs in SpA, and also showed a high prevalence of asymptomatic enthesopathy in SpA patients.

CME

Credits

SpA is characterized by the loss of normal fibrous tissue echoes at the enthesis, especially during acute inflammation, which manifests as increased thickness and decreased echogenicity. Deposits of calcifications, fibrous scars, and periosteal changes are also common. Grayscale ultrasound imaging can be used to assess local structural damages in enthesitis.^[3] Figure 1 shows the structural changes of chronic Achilles enthesopathy. In 2002 and 2003, D'Agostino *et al.*^[4] first described the abnormal power Doppler flows during the inflammatory phase, which added accuracy for differential diagnosis and evaluation of therapeutic effect via musculoskeletal ultrasound.

There are several ultrasound scoring systems for enthesipathy in SpA, such as Glasgow Ultrasound Enthesitis Scoring System,



Figure 1: Chronic Achilles enthesopathy. Presence of calcaneal erosions, calcifications and bone cortex irregularity at the calcaneal insertion of Achilles tendon

Address for correspondence: Dr. Kuo-Lung Lai, Department of Internal Medicine, Division of Allergy, Immunology and Rheumatology, Taichung Veterans General Hospital, 1650, Section 4, Taiwan Boulevard, Xitun District, Taichung City 40705, Taiwan. E-mail: kllaichiayi@yahoo.com.tw

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Hong WJ, Lai KL. The clinical experience of musculoskeletal ultrasound for enthesitis in seronegative spondyloarthropathy. J Med Ultrasound 2021;29:237-8.

237

Hong and Lai: Ultrasound for enthesitis in SpA

Table 1: Comparison of ultrasound scoring systems for enthesopathy				
Site	GUESS	MASEI	GRAPPA US	OMERACT US
Bilateral Achilles enthesis	+	+	+	+
Bilateral plantar fascia	+	+	+	-
Bilateral proximal patellar ligament attachments	+	+	+	+
Bilateral distal patellar ligament attachments	+	+	+	-
Bilateral quadriceps insertion	+	+	+	+
Bilateral triceps insertion	—	+	+	-
Bilateral lateral epicondyle	—	-	+	+
Bilateral supraspinatus	-	-	+	-
Doppler within 2 mm of the cortex of the enthesis	_	+	+	+
Doppler > 2 mm from the cortex of the enthesis	—	+	+	-
Doppler at bursa	_	+	+	-

GUESS: Glasgow ultrasound enthesitis score, MASEI: Madrid sonography enthesitis index, GRAPPA US: Proposed enthesitis score by the GRAPPA ultrasound working group, OMERACT US: Proposed enthesitis score by the OMERACT ultrasound enthesitis working group

D'Agostino Scoring System, Spanish Enthesitis Index, MAdrid Sonographic Enthesitis Index (MASEI), and Belgrade Ultrasound Enthesitis Score. Table 1 Lists the different ultrasound scoring systems for enthesopathy.^[5] The MASEI is currently a complete evaluation method that follows the OMERACT definition of enthesopathy. A MASEI score ≥18 points has a sensitivity of 83.3% and a specificity of 82.8% for SpA.

The European Alliance of Associations for Rheumatology first proposed in 2015 that relevant imaging should be used as a reference for the clinical management of SpA, with special emphasis on the role of musculoskeletal ultrasound. Ultrasound for enthesopathy not only diagnoses SpA more accurately but also makes immediate adjustments to the treatment through the assessment of acute inflammation and chronic changes, and is helpful to follow the effect and prognosis of treatment. Therefore, the application of musculoskeletal ultrasound for enthesopathy of SpA is beneficial for current clinical practice in rheumatology.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- 1. Lehtinen A, Taavitsainen M, Leirisalo-Repo M. Sonographic analysis of enthesopathy in the lower extremities of patients with spondylarthropathy. Clin Exp Rheumatol 1994;12:143-8.
- 2. Balint PV, Kane D, Wilson H, McInnes IB, Sturrock RD. Ultrasonography of entheseal insertions in the lower limb in spondyloarthropathy. Ann Rheum Dis 2002;61:905-10.
- 3 Kaeley GS, Eder L, Aydin SZ, Gutierrez M, Bakewell C. Enthesitis: A hallmark of psoriatic arthritis. Semin Arthritis Rheum 2018;48:35-43.
- 4. D'Agostino MA, Said-Nahal R, Hacquard-Bouder C, Brasseur JL, Dougados M, Breban M. Assessment of peripheral enthesitis in the spondylarthropathies by ultrasonography combined with power Doppler: A cross-sectional study. Arthritis Rheum 2003;48:523-33.
- 5. Kaeley GS. Enthesitis in psoriatic arthritis (Part 2): Imaging. Rheumatology (Oxford) 2020;59:i15-20.