**Introduction**

From the Taiwan National Health Insurance database, rheumatoid arthritis (RA) is one of the most prevalent autoimmune inflammatory diseases which results in chronic synovitis and joint deformities.\(^1\) For preventing bone erosion and joint deformities, targeted treatment is recommended to reach sustained remission or low disease activity by the American College of Rheumatology/European League Against Rheumatism (EULAR).\(^2-4\) However, the response rates for achieving low disease activity and remission were shown optimally no more than 50% and 20%.\(^4,5\) Through the remarkable advancement of ultrasound (US) in the clinical practice of inflammatory arthritis, RA probably has the most advantages from true remission which defined as the absence of active disease and progression of anatomical destruction.\(^6\) With more evidence, EULAR recommended that US is superior to clinical examination in the detection of joint inflammation and a standard care for RA.\(^7-9\) This brief review provides the main US scoring systems with semiquantitative measurements on the detection of synovitis and tenosynovitis in patient with RA.\(^10-14\)

**Sonographic findings of Synovitis and Tenosynovitis**

In 2017, the EULAR-Outcome Measures in Rheumatology Clinical Trials (OMERACT) US task force published consensus-based definitions for synovitis in RA. The consensus stated that synovial hypertrophy is necessary for synovitis even in the absence of Doppler signal, but the existence of synovial effusion alone is not sufficient to define synovitis.\(^10\) In 2005, the OMERACT task force reached a wide agreement for tenosynovitis defined as hypoechoic or anechoic thickened tissue with or without fluid within the tendon sheath, which is seen in two perpendicular planes and may exhibit Doppler signal.\(^11\) Accordingly, sonographic findings demonstrated that the flexor tendons of the II, III, and IV fingers and the extensor carpi ulnaris tendon involved in RA have the most common hand tenosynovitis [Table 1].\(^15\)

**Semiquantitative Scoring System of Synovitis and Tenosynovitis**

The values of US scoring systems to evaluate disease activity, and joint and tendon destruction provide evidence for rheumatologists to follow tight control in order to reach targeted therapy for RA. For semiquantitative measurements of synovitis in RA, grayscale, and Doppler findings have been graded independently, and each elementary component devoted to its special scoring system\(^12,13,16,17\) [Figure 1]. However, here, we only introduced two scoring systems in Table 2: Leeds score together with EULAR-OMERACT score which were most frequently used recently.\(^12,13\) Although RA involved tenosynovitis is very common, the heterogenicity of tenosynovitis morphology makes it difficulty in standardization.
In 2012, the OMERACT US task force agreed a four-graded semiquantitative measurement from 0 to 3 for B-mode tenosynovitis, but the interobserver reliability is moderate. They only reached a wide-agreement in semiquantitative scoring system for tenosynovitis on Doppler mode [14] [Figure 2].

**Conclusions**

In our narrative review, we described the fundamental sonographic abnormalities and highlighted the most frequently useful scoring system in considering synovitis and tenosynovitis of RA. With visualization of the pathologic changes (i.e., proliferative synovitis, tenosynovitis, and bone erosions) by RA, we believed that the real-time US has additionally convincing value over the clinical examination and laboratory inflammatory biomarkers.

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Conflicts of interest
There are no conflicts of interest.

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