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During the last 20 years, Musculoskeletal Ultrasound (MSUS) practice knew great developments among rheumatologists, due to the improvement of the quality and the reduction in costs of the US machines, and the better understanding of the role of ultrasound in the diagnosis, follow-up and treatment of rheumatic conditions. In Europe and the USA, MSUS became a part of the daily practice of many rheumatologists, and in many countries, MSUS learning is systematically implemented during residency<sup>1</sup>.

Among the reasons why MSUS practice is still growing, we can note the high costs and low access to Magnetic Resonance Imaging (MRI) in most countries, ionizing radiations with X-rays and computed tomography, the possibility to explore many anatomical regions at once with ultrasound and dynamically assess tendons and joints, the absence of contra-indications and being extremely patient-friendly. Ultrasound is even superior to MRI when dealing with superficial structures such as tendons and small joints of the hands and feet. Doppler is another advantage with MSUS as it allows direct visualization of micro-vascularization and thus gives an indirect idea on active inflammation. In Algeria, MSUS examination costs 20 times less than an MRI examination and 5 times less than a CT-scan and more than 100 rheumatologists in the country are equipped with US machines, making of it the first choice imaging modality in most of rheumatic situations.

Many studies have demonstrated the superiority of MSUS over clinical examination in assessing lesions such as synovitis, tenosynovitis and tendonitis<sup>2</sup> and the superiority over X-rays in terms of the detection of erosions and calcifications<sup>3</sup>. One of the most fascinating aspects of MSUS is the power to detect early flares in RA patients who are on perfect clinical remission<sup>4</sup>.

In RA, MSUS is superior to physical examination in detecting synovitis and tenosynovitis and predicting structural damage; it is also superior to X-rays in showing erosions, with 7 times more erosions in early RA than X-rays<sup>5</sup>.

It also helps in distinguishing between osteoarthritis and RA of the hand, between RA and polymyalgia rheumatica in the elderly and between RA and psoriatic arthritis of the hands and the feet<sup>6</sup>.

In Spondyloarthritis (SpA), MSUS is valuable in detecting enthesitis. Many scores have been developed to identify early SpA according to the presence and the features of enthesitis<sup>7</sup>. In psoriatic arthritis, dactylitis has a typical aspect on US, even in toes, for which clinical assessment is difficult.

In crystal-related diseases, the place of MSUS is being extensively studied during the last years. Many studies have shown a better visualization of gout and pseudogout lesions using MSUS than X-rays, especially in early disease. In gout, two elementary lesions are specific: the “double contour” sign and the tophus aggregates. More importantly, these lesions may decrease or even disappear under urate lowering therapy, making of US a good monitoring therapy<sup>8</sup>. In pseudogout, MSUS allows a direct visualization of intra-articular, ligament and meniscal calcifications with a pathognomonic aspect<sup>9</sup>.

MSUS seems a reliable technique in detecting inflammation in large-vessel vasculitis, particularly in giant cell arteritis. A typical “halo sign” is pathognomonic and may replace, in many cases, temporal artery biopsy<sup>10</sup>. However, training with a learning curve is required to perform such examinations and avoid false negative and false positive aspects as well as common pitfalls.

Osteoarthritis (OA) is a very frequent rheumatic condition. The ability of MSUS to assess inflammatory changes in OA (synovitis) as well as structural changes (osteophytes, cartilage thinning) has been recently investigated. Most studies reported a high prevalence of these changes, but some questions remained unanswered, such as the ability of MSUS to distinguish between symptomatic and asymptomatic OA, how to follow OA, and how to assess response to treatment<sup>11</sup>.

In Fibromyalgia (FM), MSUS may help in distinguishing primary from secondary forms, linked to inflammatory

diseases. In muscle pathology, MSUS is very useful in detecting and grading muscle damage and monitoring lesions over time, as well as helping interventional procedures (haematoma puncture, injections)<sup>12</sup>. Finally, in infections, US helps detect and aspirate fluid for further investigations.

Ultrasound is a great tool for helping the rheumatologist in his daily practice. Many certificates and diplomas are available in the African continent, especially in Egypt (EULAR introductory course), in Morocco (DU Rhumecho) and Algeria (DU Ecrin). Hundreds of physicians have been introduced to MSUS through these certificates and we hope that other African national societies will create such diplomas and integrate MSUS as part of the residency curriculum and continuing medical training in their countries. Ultrasound may be an excellent imaging modality in African countries because of the low cost of US procedures, making possible, more than ever, to concretize MSUS as the “Rheumatologist’s stethoscope”.

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