Controversies in foot ultrasound assessment in juvenile idiopathic arthritis

Comment on: The paediatric foot: prevalence and differentiation of sonographic and podiatric findings in juvenile arthritis and healthy children

Sirs,

We read with interest the article published in *Clinical and Experimental Rheumatology* by Collado *et al*. (1) describing specific foot ultrasound (US) abnormalities that may help Pediatric Rheumatologists to suspect the presence of juvenile idiopathic arthritis (JIA), such as the presence of grey-scale synovitis of both first and second metatarsophalangeal joints (MTP-1 and MTP-2, respectively). Conversely, the presence of isolated grey-scale MTP-1 synovitis was present in both JIA patients and healthy children and it was not considered pathologic. These findings may lead both to an earlier and more accurate diagnosis of JIA, improving its management specially in those who present milder symptoms at disease onset. The authors only assessed MTP-1 and MTP-2. Therefore, combinations of different US abnormalities at different MTPs were not analysed.

We present a case of a 9-year-old boy with forefoot pain after practicing skating in July 2020. His symptoms were never fully relieved with non-steroidal anti-inflammatory drugs (NSAIDs) and the patient was sent to the Paediatric Rheumatology unit. Tenderness at MTP-1 and MTP-4 was shown at physical examination with no clear synovitis. The patient had no other signs or symptoms nor family history of inflammatory arthropathies nor psoriasis/inflammatory bowel disease. A blood test showed erythrocyte sedimentation rate of 27 mmHg and C-reactive protein of 7 mg/dl and positive HLAB27. A magnetic resonance imaging (MRI) demonstrated the presence of inflammatory changes at MTP-1, first proximal interphalangeal joint (PIP), bone oedema on both first and fourth metatarsal and proximal phalanx bones (Fig. 1). An enthesitis-related JIA diagnosis was stablished. The patient received intra-articular steroid injections at MTP-1, MTP-4 and PIP-1 although oral methotrexate (10 mg/m^2) was further initiated. Two months later the patient showed significant clinical improvement. Therefore, we suggest other US abnormalities (MTP-1 and MTP-4, for instance) might be considered when JIA diagnosis is on the edge. Besides, we would include the assessment of bone erosions by US (and/or MRI) in order to more accurately define a potential case of JIA.

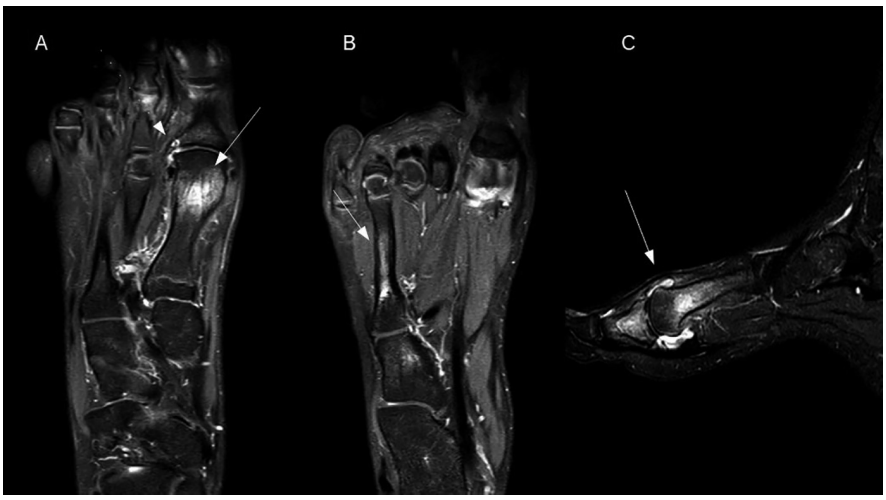

Fig. 1. Magnetic resonance imaging STIR sequences of a 9-year-old boy's left foot with juvenile idiopathic arthritis.
A: continuous white arrow, bone oedema on first metatarsal bone; broken white arrow, bone erosion.
B: continuous white arrow, bone oedema on fourth metatarsal bone.
C: continuous white arrow, synovial hypertrophy on first metatarsophalangeal joint.
The patient signed an informed consent form giving permission for publication.

Moreover, the authors did not specify the grade of grey-scale synovitis associated to JIA patients (1). This is a controversial issue, as standardisation has not been completely established in JIA yet (2). Intensity (grades) of grey-scale synovitis is yet to be clearly defined in children (3). Inversely, in adults with rheumatoid arthritis, a semi-quantitative grey-scale assessment range from 0 to 3, being 0 the absence of and 3 the largest presence of synovial hypertrophy/effusion (3). Besides, how power-Doppler application would also help to detect 'inflammatory US changes' is yet to be fully defined in children with JIA. Actually, an interesting effort by Magni-Manzoni *et al*. was not able to clarify if US was a reliable tool in order to confirm clinical remission and to predict flare in JIA patients. Several US abnormalities were found in JIA patients fulfilling clinical remission criteria with no further flares despite the presence of them (5).

Finally, the hypermobility that characterises children may contribute to the presence of a low-grade grey-scale synovitis in US assessment, as suggested by Collado *et al*. (1). Whether this hypermobility varies through time as children experience skeletal growth and changes on joint structures is yet to be assessed. Another issue is how the presence of US findings might be seen unilateral or bilaterally in order to suggest a 'normal' symmetry or abnormal asymmetry.

In conclusion, several US findings, or combination of them, would help paediatric rheumatologists to suspect the presence of JIA in children with disability/joint pain or swelling and address a better management. However, some issues must be addressed and need further study such as grey-scale synovitis standardisation, the use of power Doppler, and the impact of growth on the above-mentioned JIA-related US findings.

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