Dactylitis: more than just arthritis

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Dactylitis is a hallmark manifestation of psoriatic arthritis (PsA) and a key feature for PsA diagnosis, that occurs in 30 to 50% of PsA patients, often in early disease[1]. Classification criteria for psoriatic arthritis (CASPAR) have highlighted the specificity of dactylitis as one of the most discriminative musculoskeletal manifestation in PsA patients[2-3]. Dactylitis seems to be slightly more frequent in males and to affect more often toes than fingers, in an asymmetric distribution[3]. The natural clinical course of dactytilitis is however largely unknown. Acute/tender or active dactylitis are usually distinguished from the chronic/non tender and inactive forms, although their correlation with pathologic features has been sparsely studied[4]. Despite these limitations consistent evidence supports tender dactylitis as an unfavorable prognostic factor due to an increased risk of local erosive structural damage[3,5]. For yet unclear mechanisms, the risk for developing erosions in PsA is higher in patients with dactylitis in comparison with those that show only arthritis.

Of interest, similar diffuse swelling of a whole finger can be observed in other forms of spondyloarthritis (SpA) namely reactive arthritis and undifferentiated SpA; but also in other diseases such as gout, sarcoidosis, tuberculosis, syphilis, sickle cell disease and flexor tendons sheath infections[6].

The clinical assessment of dactylitis is based on physical examination. The recognition that dactylitis is a distinct entity from arthritis, that is not accurately monitored as a tender/swollen joint, led to the introduction of dactylitis digit counts as an outcome measure in some randomized controlled trials[7-8]. Aiming at improving the discriminative capacity between treatments arms, the dactylitis severity score (DSS) was developed and become the most widely used score[9-15]. Later, the Leeds dactylitis index (LDI), specifically designed for PsA dactylitis, allowed the assessment of severity in a more objective manner, based in the digital circumference in the proximal phalanx (swelling) and a 0-3 tenderness score[16-17]. Dactylitis also integrates implemented composite indexes such as the composite psoriatic arthritis disease activity index (CPDAI) and the psoriatic arthritis disease activity score (PASDAS), and the minimal disease activity (MDA) criteria for PsA[18-20].

The complementary use of imaging tools such as magnetic resonance (MRI) and ultrasound (US) is of fundamental importance to improve the characterization of dactylitis and to discriminate between responders and non-responders to therapy. Imaging descriptions suggest that dactylitis is a highly heterogeneous and complex entity including tenosynovitis, soft tissue oedema, osteitis, enthesitis and synovitis. The first imaging studies described a predominant flexor tenosynovitis suggesting, that the presence of synovitis was not required for the typical sausage-like finger shape[21]. Synovitis was reported as a more variable coexisting elementary feature, appearing in 16% to 61% of cases[22-23]. Soft tissue thickening (extra-tendinous), extensor tendon inflammation, bone oedema, intra and extra-articular osteoproliferation were later described[4,24]. More recently, high resolution MRI has highlighted the possible role for enthesitis of the finger pulleys and fibrous sheats, supporting other previous observations implicating enthesitis on dactylitis pathophysiology[24-26]. Nevertheless, there is still large heterogeneity in the imaging descriptions of dactylitis and the ability to characterize its different elementary features is dependent on high quality imaging protocols and dedicated surface MRI coils. Due to the small dimensions of the structures under study, attention to technical details is more crucial than in studies of large joints such as the knee and shoulder. In this context it has been challenging to establish MRI or US scores dedicated to dactylitis. An attempt was performed by scoring eight MRI dactylitis features, as present and absent, at the metacarpophalangeal, proximal interphalangeal and distal interphalangeal joints of each dactylitic digit; but this score requires further validation

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and more broadly application[4]. The PsA MRI score (PsAMRIS) developed by the outcome measure in rheumatology clinical trials (OMERACT) includes dactylitis elements such as tenossynovitis, periarticular inflammation and bone proliferation but was not structured to assess dactylitis as an individualized outcome[27]. Furthermore, the comparison of data between different studies may not be possible or accurate, if the criteria for adequate image resolution are not similar.

Of notice, dactylitis physiopathogenic mechanisms are still to be unveiled. In contrast to a reasonable number of studies describing PsA synovitis, the less accessible biopsies of tendons and soft tissue comprising PsA dactylitis, precludes the comprehension of both cellular and molecular pathways inherent to this manifestation. Histological characterization has just been recently reported, in psoriatic juvenile idiopathic arthritis, showing a hypervascular tenosynovium with predominant T cells infiltrate and stromal reaction with excessive myxoid extracellular matrix deposition; additionally suggesting enthesitis of the flexor tendon, as depicted by MRI. There are however several limitations in this report, including the presence of concomitant juvenile dermatomyositis and immunosuppressive therapy, and the possibility of drug induced psoriasis and PsA[28].

The therapeutic strategies for dactylitis are largely empirical, with a profound absence of knowledge regarding the impact on disease progression. Most physicians will use non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroids injections as first line therapy, although they have not been formally studied[29]. The 2011, and the recently presented update of the EULAR recommendations for the management of psoriatic arthritis considers the use of biologic (b)DMARDs (TNF inhibitors or biologics targeting IL12/23 or IL17), in patients with dactylitis, with impact on function and quality of life, refractory to NSAIDs or local corticosteroids injections[30]. A similar algorithm is suggested by the group for research and assessment of Psoriasis and PsA (GRAPPA)[29,31]. The rational for not advocating the use of conventional synthetic (cs)DMARDs is based in the scarce evidence of efficacy and absence of properly designed studies[32]. Furthermore, the effect of methotrexate (MTX), frequently recommended as first line DMARD, on the different tissue compartments of dactylitis, has not been properly studied and there is no data supporting its effect on the inhibition of radiographic progression in PsA. Despite, many physicians would still choose to start patients on csDMARDs, often in the presence of concomitant peripheral joint disease, as postulated by other guidelines, including our national guidelines[33-35]. GRAPPA review on dactylitis treatment elegantly highlights the paucity of evidence in this field and the need for studies having dactylitis as primary endpoint[29]. In fact, there are several registered trials including dactylitis as an outcome measure but only one (GO-DACT) assessing dactylitis as primary endpoint[36].

Considering the importance of dactylitis in the structural impact of PsA, the improvement of dactylitis algorithm towards an efficacious and prolonged remission and prevention of irreversible bone damage, should be envisaged in a near future.

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