

Ultrasonography in psoriatic arthritis: which sites should we scan?

In psoriatic arthritis (PsA), ultrasonography (US) plays a growing role in the differential diagnosis and in monitoring treatment response.¹ PsA is a heterogeneous disease with different domains and peculiar sites involved.² Therefore, a dedicated US composite score is needed to monitor disease activity and to identify structural damage progression. A recently published Systematic Literature Review (SLR) identified only two US scores specifically developed for PsA (ie, STPD and PsA-Son) and, although these had a good sensitivity to detect inflammation and a good feasibility, they have not been validated in other series.^{1,3,4} Recently, the Study Group for US of the Italian Society of Rheumatology promoted the Ultrasound in Psoriatic Arthritis TREATment (UPSTREAM) study (registered at ClinicalTrials.gov, NCT03330769). UPSTREAM is a multicentre observational prospective cohort study and it represents the first example of integration between clinical examination and US with the aim

to identify predictors of achieving minimal disease activity in patients with PsA starting a new course of therapy.

Our first step, towards the development of a US composite score to be used as an outcome in UPSTREAM, was a qualitative research aimed to define those anatomic sites that are considered relevant by rheumatologists, expert in management of PsA and US. For this purpose, a web-based ranking exercise on the relative relevance of different anatomic structures was done.

Bilaterally, seven entheses, eight joints, 10 tendons with sheath, two tendons without sheath and seven anatomic sites for bursae and soft tissues were identified on the basis of the previous SLR and submitted to vote in the survey.¹ See [table 1](#) for detailed localisation of each anatomic sites. Within every anatomic structure, a further ranking of sites (eg, for joints: metacarpophalangeal, proximal, distal interphalangeal and metatarsophalangeal joints, wrist, knee) was asked. The between and within weights were calculated as mean of reciprocal rank normalised to 0%–100%. In order to balance for the number of items in each category, the final weight was calculated as product of between and within weights multiplied for the number of items and normalised to 0%–100%. Final ranking identified those items candidate to be incorporated in the

Table 1 Ranking of the anatomical sites

Structure	Between structure rank	Between structure weight*	Site	Within structure rank	Within structure weight*	Overall weight†	Overall rank
Enthesis	1	27%	Achilles tendon	1	26%	7%	1
			Patellar ligament (proximal insertion)	2	15%	4%	7
			Patellar ligament (distal insertion)	3	14%	4%	10
			Quadriceps tendon	4	13%	4%	11
			Common extensor tendon (lateral elbow)	5	11%	3%	13
			Plantar aponeurosis	6	11%	3%	14
			Distal insertion of extensor tendon of the finger	7	9%	2%	20
Joint	2	26%	Proximal interphalangeal joint (hand)	1	17%	5%	2
			Metacarpophalangeal joint	2	16%	5%	3
			Wrist joints	3	15%	4%	5
			Knee	4	13%	4%	8
			Distal interphalangeal joint (hand)	5	12%	3%	12
			Metatarsophalangeal joint	6	10%	3%	16
			Ankle joints	7	9%	2%	19
			Elbow joints	8	8%	2%	21
Tendon with sheath	3	18%	Flexor tendon of the digit	1	17%	4%	4
			Compartment of extensor tendons (wrist)	2	16%	4%	6
			Posterior tibialis tendon	3	11%	3%	15
			Anterior tibialis tendon	4	10%	3%	17
			Peroneal tendons	5	10%	3%	18
			Extensor hallucis longus tendon	6	8%	2%	22
			Extensor digitorum longus tendon	7	8%	2%	25
			Flexor digitorum longus tendon	8	7%	2%	27
			Flexor hallucis longus tendon	9	7%	2%	29
			Flexor tendons of the toes	10	6%	2%	30
Tendon without sheath	4	16%	Extensor tendons of the digits	1	63%	2%	24
			Extensor tendons of the toes	2	37%	1%	34
Bursa and subcutaneous tissue	5	14%	Achilles bursa	1	26%	4%	9
			Olecranic bursa	2	15%	2%	23
			Semimembranosus and gastrocnemius bursa	3	15%	2%	26
			Soft tissue oedema of the hands	4	14%	2%	28
			Medial malleolar bursa	5	11%	2%	31
			Lateral malleolar bursa	6	10%	1%	32
			Soft tissue oedema of the toes	7	10%	1%	33

The sites included in ultrasound scanning protocol of the Ultrasound in Psoriatic Arthritis TREATment study are marked in green in the 'rank' column.

*Calculated as inverse of mean rank normalised from 0% to 100%.

†Calculated as product of structure weights*site weight*number of sites within structure and normalised to 0%–100%.

scanning US protocol of the UPSTREAM study. To satisfy content validity requirement, at least one item per anatomic structure was included. Twenty rheumatologists, with experience in musculoskeletal US and in the management of PsA, participated in the web exercise. The anatomic structures with a better ranking were: entheses, joints, tendons with sheath, tendons without sheath and ultimately soft tissues and bursae. Considering the overall weight for each site, entheses of Achilles tendon achieved the best results. The full results are reported in [table 1](#). Through this web-based exercise, we identified the anatomic sites considered useful in revealing typical US changes of PsA and they will be incorporated in the US protocol of the UPSTREAM study. This is a first essential step to assess the content of a simplified US score that will encompass both joint and extra-articular structures, most informative in the US evaluation of PsA.

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REFERENCES

- Zabotti A, Bandinelli F, Batticciotto A, *et al.* Musculoskeletal ultrasonography for psoriatic arthritis and psoriasis patients: a systematic literature review. *Rheumatology* 2017;56:1518–1532.
- McGonagle D, Lories RJ, Tan AL, *et al.* The concept of a "synovio-enthesal complex" and its implications for understanding joint inflammation and damage in psoriatic arthritis and beyond. *Arthritis Rheum* 2007;56:2482–91.
- Gutierrez M, Di Geso L, Salaffi F, *et al.* Development of a preliminary US power Doppler composite score for monitoring treatment in PsA. *Rheumatology* 2012;51:1261–8.
- Ficjan A, Husic R, Gretler J, *et al.* Ultrasound composite scores for the assessment of inflammatory and structural pathologies in Psoriatic Arthritis (PsASon-Score). *Arthritis Res Ther* 2014;16:476.



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