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Can FOI Help Differentiate Psoriatic Arthritis From Erosive Hand Osteoarthritis?

Ryan Quigley:
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I'm Ryan Quigley, and today I'll be discussing a 2025 study exploring whether indocyanine green-based fluorescence optical imaging, or FOI, can help distinguish psoriatic arthritis from erosive hand osteoarthritis.

In clinical practice, differentiating these two conditions is often less straightforward than we'd like. Both conditions often involve the DIP and PIP joints of the hand and can present with overlapping symptoms, as well as inflammatory features on imaging. Yet the treatments are different, and misclassification can delay appropriate therapy, particularly when standard imaging modalities fail to provide clear discrimination. FOI, which uses indocyanine green dye to highlight increased microcirculation as a surrogate marker for inflammation, could add diagnostic clarity in this setting.

The study, published in *Frontiers in Medicine*, was a retrospective imaging analysis that included FOI sequences from 101 patients with active inflammatory hand disease. 54 patients had psoriatic arthritis, and 47 had erosive hand osteoarthritis. All participants met predefined criteria for active disease, based on swollen joints or ultrasound-confirmed synovitis.

FOI images were evaluated using a standardized scoring system: the Fluorescence Optical Imaging Activity Score, or FOIAS. This system grades the signal intensity in individual joints across multiple phases of dye inflow and washout. In addition, readers evaluated four predefined morphologic patterns that have been proposed as disease-specific FOI features. Reliability testing was performed to assess how consistently the trained readers could score joint signals and patterns.

Several findings stood out.

First, FOI signal intensity at the joint level could be assessed with good reliability, as inter-reader and intra-reader agreement was strong.

Second, and perhaps counterintuitively, patients with erosive hand osteoarthritis showed significantly stronger FOI enhancement in the DIP and PIP joints—roughly twice as high— than patients with psoriatic arthritis.

Third, among the evaluated morphologic patterns, only one showed a meaningful association with psoriatic arthritis. The Werner sign, described as a triangular or arcuate enhancement extending from the nail bed into the distal interphalangeal joint, was seen in more than half of psoriatic arthritis cases but in only about one in five erosive hand osteoarthritis cases.

And when these FOI findings were combined, imaging-based classification agreed with the clinical diagnosis in about 78 percent of cases, indicating moderate overall diagnostic performance.

So, what do these findings mean for clinicians?

FOI is a rapid, well-tolerated imaging modality, and these results suggest that assessing FOI signal intensity and morphological patterns in hand joints may add useful information when psoriatic arthritis and erosive hand osteoarthritis are difficult to distinguish clinically.

That said, there are important limitations. This was a retrospective analysis, and the erosive hand osteoarthritis group was older and had higher clinical joint counts than the psoriatic arthritis group. Nearly half of psoriatic arthritis patients were receiving disease-modifying therapy, which may have dampened inflammatory signals. In addition, morphologic pattern recognition showed only modest reliability, limiting its standalone diagnostic value.

Still, these findings suggest that FOI may offer value as an adjunct imaging tool in the context of clinical findings and other imaging modalities. Strong signal intensity in the proximal and distal interphalangeal joints may point toward erosive hand osteoarthritis, while the presence of the Werner sign may increase suspicion for psoriatic arthritis. The authors also note that future integration of artificial intelligence–based pattern recognition could improve diagnostic performance and reduce observer variability.

This has been an *AudioAbstract*, and I'm Ryan Quigley. To access this and other episodes in our series, visit ReachMD dot com, where you can Be Part of the Knowledge. Thanks for listening.

Reference

Drude B, Maugesten Ø, Werner SG, et al. Differential diagnosis between psoriatic arthritis and hand osteoarthritis using indocyanine green-based fluorescence optical imaging. *Frontiers in Medicine.* 2025;12:1581265. doi:10.3389/fmed.2025.1581265