

Some morphological substrates in the pathogenesis of arthritis.

Author(s) K. J. van Zwieten (1), I. Lambrichts (1), B. S. de Bakker (2), L. Kosten (1), S. De Munter (1), P. Gervois (1), K. P. Schmidt (1), P. L. Lippens (1).

Organisations Department of Anatomy, Morphology, BioMed Institute, University of Hasselt, Diepenbeek, Belgium (1), Department of Anatomy, Embryology and Physiology, Academic Medical Center, University of Amsterdam, The Netherlands (2)

Introduction, Material and Methods. In order to gain more insight into the morphogenesis of synovial joints, as well as into pathogenesises of joint diseases like Rheumatoid Arthritis (RA) and possibly also Osteoarthritis (OA), we surveyed human finger joint ontogeny from early developmental stages (1). High Resolution Magnetic Resonance Imaging (HR-MRI) of the adult proximal interphalangeal (PIP)-joint in an otherwise normal anatomical specimen of the finger was then analyzed. We also investigated the histology of a part of the PIP-joint capsule, the Proper Collateral Ligament (PCL).

Observational results. Prior to finger joint cavitation, the interphalangeal interzones of the fingers prefigure convexities at the future 'ball'-side of each joint, and concavities at its future 'socket'-side. At the peripheries of their central intermediate laminae (2), the increasing incongruences of the PIP-joint's articular surfaces during ontogeny become 'compensated' by meniscus-like vascularized synovial folds (3). In adult proximal interphalangeal joints, dorsal and palmar but also ulnar and radial such synovial folds do persist, as our HR-MRI slices reveal. Not only synovial membranes but also synovial folds (e.g., after micro-damage) may elicit chronic inflammatory processes that eventually lead to arthritis. This focused our attention on the normal vascularity of the articular capsules of finger joints. Capillaries accompanied by neurons, surrounded by connective tissues, pierce through the various collagenous fiber-bundles of the PIP-joint's Proper Collateral Ligament. The accompanying neural structures were made visible in detail.

Results, Conclusions. In PIP collateral ligaments, we found neurofilaments and oval-shaped lamellated corpuscles ($\varnothing \approx 120 \mu$) (4). Supposedly acting as mechanoreceptors in finger motion, they may also produce cytokines and substance P, a neuropeptide involved in pain (5). As clinically, the interphalangeal joints of fingers show symptoms of RA at early stages, these organs therefore may also play a role in the pathogenesises of joint inflammation.

References

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Presenting Author: Koos Jaap van Zwieten, Professor of Anatomy, University of Hasselt, Belgium

Presenter e-mail koosjaap.vanzwieten@uhasselt.be

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