Topographic Pain Mapping versus Radiological Inter-observer Variation in Ankle Arthritis
Fiona Ashton, MRCSEd, Jayasree Ramas Ramaskandhan, MD, Adam Farrier, MB ChB, Malik Siddique, DO

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Introduction/Purpose: Topographic pain mapping has gained popularity during 20th century, providing opportunities for patients to demonstrate spatial distribution of pain. Despite this, evidence of clinical application in orthopaedics remains largely limited to spinal pathologies. We investigate how clinician interpretation of routine radiological studies compares to patient pain mapping in ankle arthritis.

Methods: Between 2014 and 2016 we identified 21 patients ultimately diagnosed with ankle arthritis, who underwent comprehensive gait analysis (including topographic pain mapping) on referral to our institution. Patients were requested to map up to three pain areas, assigning a visual analogue score (VAS) of 0-10, to signify severity of pain in each area.

A consultant orthopaedic foot and ankle surgeon, and orthopaedic trainees undertook blinded evaluation of relevant radiological studies, estimating patients’ mapping and VAS scores on the basis of radiological pathology.

For the purpose of analysis findings were applied to five distinct regions around the ankle: three anterior (antero-medial; central; and antero-lateral), lateral and medial. Results were correlated between the different assessors, as well as to the patients’ pain mapping, using Spearman’s Rho & Kendall Tau correlation statistics, significance taken as p=<0.05.

Results: There is a strong radiological inter-observer correlation for anterior ankle pain in ankle arthritis [Antero-lateral 0.751 (p=0.012); Central 0.912 (p=<0.001)]. These findings also correlate well with patient pain mapping [Central consultant-patient 0.920 (p=<0.001); trainee-patient 0.982 (p=<0.001)].

Assessment of medial (tibialis posterior) and lateral (subtalar/peroneal) pathology demonstrates poorer inter-observer correlations (p>0.05). Correlation to patient pain mapping was even poorer, with radiological assessment consistently over-estimating symptom severity (p>=0.05).

Conclusion: There is a statistically strong correlation between topographic pain mapping and radiological evaluation of ankle arthritis. We strongly recommend that additional pathology around the ankle is excluded by use of pre-operative MRI imaging prior to surgery for ankle arthritis. Pain from ankle arthritis appears to mask additional soft tissue pathology surrounding the ankle noted on MRI scan.

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