



¹⁸F-Fluciclovine PET Uptake in Thumb Carpometacarpal Joint: Initial Observations

¹Yasser G. Abdelhafez, ¹Lorenzo Nardo, ^{1,2}Simon R. Cherry, ^{1,2}Ramsey D. Badawi, ¹Abhijit J. Chaudhari

¹Department of Radiology, ²Department of Biomedical Engineering, UC Davis

INTRODUCTION: Thumb carpometacarpal (CMC) joint osteoarthritis (OA) is a common yet poorly understood condition with high prevalence in the older population¹. Altered joint amino acid (AA) metabolism has been hypothesized to contribute to OA pathogenesis^{2,3}. Among the AAs, glutamine was shown to be deficient in the synovial fluid of OA joints^{2,3}. ¹⁸F-Fluciclovine is a synthetic AA that behaves in vivo like glutamine⁴. In this work, we evaluated the frequency of detecting thumb CMC abnormality on ¹⁸F-Fluciclovine PET/CT scans.

METHODS: We included men with prostate cancer who underwent standard-of-care ¹⁸F-Fluciclovine total-body PET/CT scans for evaluation of biochemical recurrence and/or disease extent. Images were read for any abnormal uptake at the thumb CMC joint. The CT portion of the study was reviewed for structural changes of osteoarthritis; accordingly, Eaton-Littler Stage between I & IV was assigned for each joint.

RESULTS: A total of 28 scans were deemed evaluable (28 patients, mean age 73±9 yrs). On PET, 24 joints from 17 patients showed abnormal ¹⁸F-Fluciclovine uptake (Table under Figure 1A, Top). Concordance between PET and CT was seen in 42 joints (25 negative, 17 positive). PET was positive in 7 joints that were negative on CT for OA (Figure 1B) while CT was positive in 7 joints that showed no abnormal uptake on PET images. SUVmax showed moderate positive correlation with Eaton Littler stage (**Graph under Figure 1A, Bottom**).

DISCUSSION: The elevated ¹⁸F-Fluciclovine uptake in an OA joint may indicate glutamine deficiency, hence T-cell activation, a bellwether for downstream joint degeneration³. Administration of glutamine has suppressed OA progression in a rat model, and supplementation of glutamine could provide a novel therapeutic approach to OA³.

CONCLUSION: ¹⁸F-Fluciclovine total-body PET/CT scans show accumulation of the ¹⁸F-Fluciclovine radiotracer in thumb CMC joints with OA. The uptake intensity showed a moderate correlation with Eaton-Littler OA stage.

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