

SEMI-QUANTITATIVE ANALYSIS OF ENDOMETRIOSIS SUBTYPES USING ^{99m}Tc-MARACICLATIDE SPECT-CT

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Introduction/Background:

Advancements in imaging applications for endometriosis have been highlighted as a global endometriosis research priority¹. The detection of superficial disease is a recognised limitation of existing imaging modalities². SPECT-CT imaging with ^{99m}Tc-maraciclalide has proven successful in the visual detection of endometriotic lesions including superficial disease. ^{99m}Tc-maraciclalide binds with a high affinity to $\alpha_v\beta_3$, the most commonly researched angiogenic integrin.

Methods/Methodology: A Phase 2 study has been completed in which prior (target 2-7 days) to laparoscopy (actual mean 18 days), 20 participants with known or suspected endometriosis received a SPECT-CT scan with intravenous ^{99m}Tc-maraciclalide. Regions of abnormal uptake were determined visually and correlated to surgical findings. Semi-quantitative analytical techniques were applied to these regions to derive standardised measures of relative tracer uptake and lesion dimensions.

Results: The DETECT study has demonstrated the utility of ^{99m}Tc-maraciclalide in the detection of endometriomas, deep disease, and superficial disease. Standardised metrics were developed to assess lesion size and specific uptake ratio, and these show alignment with the different sizes and expected levels of angiogenesis/inflammation associated with superficial disease, deep disease, and endometriomas. The semiquantitative techniques for ^{99m}Tc-maraciclalide image analysis will be discussed, along with lesion characteristics from surgical confirmation and the relevance in terms of clinical application.

Conclusions/Discussion: SPECT-CT with ^{99m}Tc-maraciclalide could serve as a minimally-invasive imaging test for endometriosis, potentially addressing the limitations in existing imaging techniques with the detection of superficial disease. Semi-quantitative techniques allow for additional assessment of the level of angiogenesis/inflammation which could have potential application in novel therapy development.

References:

¹Rogers PA et al. (2017). WES/WERF Consortium for Research Priorities in Endometriosis. *Reprod Sci.* 24(2):202-226.

²Becker CM et al. (2022). ESHRE Endometriosis Guidelines, *Human Reproduction Open*, 2022(2)