

# Digital $^{18}\text{F}$ -FDG PET/CT as a First-Line Diagnostic Tool for Cranial Giant Cell Arteritis

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With the support of a CIORA grant, we conducted an international prospective study to address a persistent challenge in rheumatology: the accurate diagnosis of giant cell arteritis (GCA). While temporal artery biopsy and ultrasound remain standard diagnostic tests, they have limitations regarding sensitivity and operator dependence. While  $^{18}\text{F}$ -FDG PET/CT has been established for detecting large vessel inflammation, it was not recommended as a first-line test for cranial GCA because older analogue devices lacked the resolution to visualize small cranial arteries. Modern PET/CT systems employing digital technology benefit from significantly improved resolution, allowing for the potential detection of smaller lesions, such as active inflammation in the vessels of the head and neck. The aim of our study was to investigate the diagnostic accuracy of these digital devices compared to ultrasound in patients with suspected GCA.

We enrolled patients aged 50 or older presenting with classical GCA symptoms across five centers in Canada, France, and the Netherlands, imaged with  $^{18}\text{F}$ -FDG PET/CT within 3 days of starting corticosteroid therapy. The cohort included 84 patients in the analysis, with a final

clinical diagnosis serving as the reference standard after six months of follow-up. Images were interpreted by blinded expert readers using standardized visual grading scales.

The results demonstrated that digital  $^{18}\text{F}$ -FDG PET/CT offers superior diagnostic performance. When integrating assessment of the cranial vessels, now a reliable possibility with digital PET/CT devices, sensitivity was 86%, with a specificity of 100% for the diagnosis of GCA. In comparison, Doppler Ultrasound (DUS) demonstrated a sensitivity of 68%, with specificity 93%. Furthermore, Bayesian analysis indicated a 98% probability that digital PET/CT outperforms ultrasound in sensitivity.

This study validates that digital  $^{18}\text{F}$ -FDG PET/CT is a highly accurate, non-invasive technique for diagnosing GCA, particularly in patients presenting with cranial symptoms. By enabling an integrated assessment of both cranial and large vessels, digital PET/CT can now be considered a viable first-line diagnostic modality. By validating the accuracy of digital PET/CT, this study provides the evidence needed to favour high-resolution imaging as a first-line modality, potentially making invasive biopsies less frequent in standard GCA care.