

Evaluation of [^{11}C]-Methionine Positron Emission Tomography and Cerebral Blood Volume Imaging in the Diagnosis of Non-Contrast-Enhanced Gliomas

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AI Overview

[^{11}C]-Methionine PET and relative cerebral blood volume (rCBV) imaging are effective for diagnosing non-contrast-enhanced gliomas, especially when MRI is inconclusive. [^{11}C]-methionine PET reliably identifies tumor metabolic activity, showing high sensitivity, while rCBV imaging, measured via MRI, indicates tumor vascularity. Combining these methods shows potential for improved diagnostic accuracy and can aid in treatment planning.

[^{11}C]-Methionine PET

- **Function:** Identifies metabolic activity, which is often increased in gliomas.
- **Benefits:**
 - High sensitivity for detecting gliomas, even non-enhancing ones.
 - Useful for differentiating between different tumor grades and for follow-up after treatment.
 - Can be more reliable than conventional MRI in cases where MRI is inconclusive.

Cerebral Blood Volume (rCBV) imaging

- **Function:**

Measures blood volume within the tumor, which is typically elevated in gliomas.
- **Benefits:**
 - Can be used to diagnose and differentiate between tumor grades.
 - Has been shown to be significantly correlated with [^{11}C]-methionine uptake, suggesting it can predict methionine accumulation.

Combined approach

- **Synergy:**

The combination of [^{11}C]-methionine PET and rCBV imaging can provide more comprehensive information than either technique alone.
- **Value:**
 - Both methods together can improve the accuracy of diagnosis.
 - The combined approach can help in surgical and radiation treatment planning and the assessment of treatment response.

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