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Neuro 2

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Recent Advances in Brain Tumor Imaging

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In the era of the 2021 WHO classification, which mandates an integrated diagnosis combining molecular genetics with histopathology, conventional imaging faces limitations in providing accurate molecular subtyping and prognostication in glioma patients. Furthermore, the advent of molecularly targeted therapies necessitates a paradigm shift in post-treatment surveillance to enable dynamic, time-dependent risk stratification. These challenges are rooted in the complexities of intratumoral heterogeneity and phenotypic plasticity, which lead to highly variable treatment responses and survival outcomes across patients.

This presentation will introduce advanced imaging techniques that address these issues to pave the way for personalized treatment. We will discuss how methods including radiomics, spatiotemporal imaging (e.g., tumor habitat analysis), and deep learning (DL) models are being developed to function as a “longitudinal virtual biopsy.” This approach offers interpretable, minimally invasive insights into tumor evolution, ultimately aiming to guide individualized patient care and optimize treatment response.