

## **Advanced Brain Tumour Imaging**

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Brain MRI is the most versatile and useful method to non-invasively study intracranial neoplasm and are helpful for pre-surgical assessment and planning, and follow up. MRI is also very important for differentiating neoplasm from tumor-like lesions that may mimic them. Basic principles to differentiate these are important, and careful analysis of different pulse sequences is needed in order to avoid common pitfalls.

Recently, newer methods of MRI including perfusion and spectroscopic imaging have the potential to not only improve differential diagnosis, but also improve post-treatment surveillance. Neovascularity from tumor angiogenesis may be studied using dynamic first pass or dynamic contrast-enhanced perfusion methods, whilst metabolic data on tumor cell membrane turnover may be independently imaged using MR spectroscopy.

Diffusion-weighted imaging (DWI) has also been applied to measure tumor cellularity in brain tumors as well as to non-invasively visualize white matter fiber tracts: combined with blood oxygen level dependent (BOLD) functional MRI, diffusion-tensor imaging (DTI) and fiber connectivity images can be useful for pre-treatment planning

This presentation will describe current and potential new clinical application of MRI methods that radiologists should be familiar with in studying neoplasms. Judicious selection in resource-constrained situations will be discussed.