Intracranial tumor diagnosis

- Targeting Glioblastoma Stem Cells: A40s Aptamer-NIR-Dye Conjugate for Glioblastoma Visualization and Treatment
- Opercular Perivascular Space Mimicking a Space-Occupying Brain Lesion: A Short Case Series
- Cognitive Decline in Nasopharyngeal Carcinoma Survivors with Post-Radiation Epilepsy: A Prospective Cohort Study
- RIPK1 in Diffuse Glioma Pathology: From Prognosis Marker to Potential Therapeutic Target
- Recent Advances in Brain Cancers
- The Circadian Rhythm Gene Network Could Distinguish Molecular Profile and Prognosis for Glioblastoma
- Analysis of the Expression Patterns of Tumor Necrosis Factor Alpha Signaling Pathways and Regulatory MicroRNAs in Astrocytic Tumors
- Pott's Puffy Tumor in the Adult Population: Systematic Review and Meta-Analysis of Case Reports

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Brain tumor diagnosis has significantly evolved with the use of PET and advanced MRI techniques. In addition to anatomical MRI, these modalities may provide valuable information for several clinical applications such as differential diagnosis, delineation of tumor extent, prognostication, differentiation between tumor relapse and treatment-related changes, and the evaluation of response to anticancer therapy. In particular, joint recommendations of the RANO group, the EANO, and major European and American Nuclear Medicine societies highlighted that the additional clinical value of radiolabeled amino acids compared to anatomical MRI alone is outstanding and that its widespread clinical use should be supported. For advanced MRI and its steadily increasing use in clinical practice, the Standardization Subcommittee of the Jumpstarting Brain Tumor Drug Development Coalition provided more recently an updated acquisition protocol for the widely used dynamic susceptibility contrast perfusion MRI. Besides amino acid PET and perfusion MRI, other PET tracers and advanced MRI techniques (e.g., MR spectroscopy) are of considerable clinical interest and are increasingly integrated into everyday clinical practice. Nevertheless, these modalities have shortcomings that should be considered in clinical routine. This comprehensive review provides an overview of potential challenges, limitations, and pitfalls associated with PET imaging and advanced MRI techniques in patients with gliomas or brain metastases. Despite these issues, PET imaging and advanced MRI techniques continue to play an indispensable role in brain tumor management. Acknowledging and mitigating these challenges through interdisciplinary collaboration, standardized protocols, and continuous innovation will further enhance the utility of these modalities in guiding optimal patient care [1)].

Early diagnosis of brain tumor is challenging and a major unmet need. Patients with brain tumors most often present with non-specific symptoms more commonly associated with less serious diagnoses, making it difficult to determine which patients to prioritize for brain imaging. Delays in diagnosis affect timely access to treatment, with potential impacts on quality of life and survival. A test to help identify which patients with non-specific symptoms are most likely to have a brain tumor at an earlier stage would dramatically impact patients by prioritizing demand on diagnostic imaging facilities. This clinical feasibility study of brain tumor early diagnosis was aimed at determining the

accuracy of our novel spectroscopic liquid biopsy test for the triage of patients with non-specific symptoms that might be indicative of a brain tumor, for brain imaging. Patients with a suspected brain tumor based on an assessment of their symptoms in primary care can be referred for open-access CT scanning. Blood samples were prospectively obtained from 385 of such patients, or patients with a new brain tumor diagnosis. Samples were analyzed using our spectroscopic liquid biopsy test to predict the presence of disease, blinded to the brain imaging findings. The results were compared to the patient's index brain imaging delivered as per standard care. The test predicted the presence of glioblastoma, the most common and aggressive brain tumor, with 91% sensitivity, and all brain tumors with 81% sensitivity, and 80% specificity. The negative predictive value was 95% and the positive predictive value was 45%. The reported levels of diagnostic accuracy presented here have the potential to improve current symptom-based referral guidelines and streamline the assessment and diagnosis of symptomatic patients with a suspected brain tumor [2)]

Brain tumors are recognized as one of the most difficult cancers to diagnose because presenting symptoms, such as headache, cognitive symptoms, and seizures, may more commonly be attributable to other, more benign conditions Common brain cancer symptoms such as headaches or memory change are non-specific and more likely to be associated with a non-cancer diagnosis.

Interventions to reduce the time to diagnosis of brain tumors include national awareness initiatives, expedited pathways, and protocols to diagnose brain tumors, based on a person's presenting symptoms and signs; and interventions to reduce waiting times for brain imaging pathways. If such interventions reduce the time to diagnosis, it may make it less likely that people experience clinical deterioration, and different treatment options may be available.

Objectives: To systematically evaluate evidence on the effectiveness of interventions that may influence: symptomatic participants to present early (shortening the patient interval), thresholds for primary care referral (shortening the primary care interval), and time to imaging diagnosis (shortening the secondary care interval and diagnostic interval). To produce a brief economic commentary, summarising the economic evaluations relevant to these interventions.

Search methods: For evidence on effectiveness, we searched CENTRAL, MEDLINE, and Embase from January 2000 to January 2020; Clinicaltrials.gov to May 2020, and conference proceedings from 2014 to 2018. For economic evidence, we searched the UK National Health Services Economic Evaluation Database from 2000 to December 2014.

Selection criteria: We planned to include studies evaluating any active intervention that may influence the diagnostic pathway, e.g. clinical guidelines, direct access imaging, public health campaigns, educational initiatives, and other interventions that might lead to early identification of primary brain tumors. We planned to include randomized and non-randomized comparative studies. Included studies would include people of any age, with a presentation that might suggest a brain tumor.

Data collection and analysis: Two review authors independently assessed titles identified by the search strategy and the full texts of potentially eligible studies. We resolved discrepancies through discussion or, if required, by consulting another review author.

Main results: We did not identify any studies for inclusion in this review. We excluded 115 studies. The main reason for exclusion of potentially eligible intervention studies was their study design, due to a lack of control groups. We found no economic evidence to inform a brief economic commentary on

this topic.

Authors' conclusions: In this version of the review, we did not identify any studies that met the review inclusion criteria for either effectiveness or cost-effectiveness. Therefore, there is no evidence from good quality studies on the best strategies to reduce the time to diagnosis of brain tumours, despite the prioritisation of research on early diagnosis by the James Lind Alliance in 2015. This review highlights the need for research in this area [3].

It remains wedded to other established approaches to tumor diagnosis such as histology and immunohistochemistry. In doing so, the fifth edition establishes some different approaches to both CNS tumor nomenclature and grading and it emphasizes the importance of integrated diagnoses and layered reports. New tumor types and subtypes are introduced, some based on novel diagnostic technologies such as DNA methylome profiling. The present review summarizes the major general changes in the 2021 fifth edition classification and the specific changes in each taxonomic category. It is hoped that this summary provides an overview to facilitate more in-depth exploration of the entire fifth edition of the WHO Classification of Tumors of the Central Nervous System [4].

Brain tumor protocol

Brain tumor protocol.

Intracranial Tumor Magnetic Resonance Imaging

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