and suggestive symptoms are associated with NM, we found very poor Sn/Sp for elevated protein (61%/61%), low glucose (33%/85%), elevated lactate (35%/91%), and symptoms consistent with NM (74%/73%). Of these, we at least an elevated lactate and symptoms were even more strongly predictive of a positive CSF cytology. No variable predicted a negative cytology, and 22.8% of patients with a positive CSF cytology had completely normal CSF findings. CONCLUSION: Generally accepted concepts about the frequency of CSF and clinical findings in patients with NM are based on biased estimates in the literature. No CSF chemistry or clinical finding reliably predicts the presence of NM, and almost a quarter of patients with cytologically proven NM have completely normal findings.

Abstracts

Poster presentations

P01 COGNITION IN BRAIN TUMORS

P01.01 A. LESION-FUNCTION ANALYSIS FROM MULTIMODAL IMAGING AND NORMATIVE BRAIN ATLASES FOR PREDICTION OF COGNITIVE DEFICITS IN GLIOMA PATIENTS

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BACKGROUND: Cognitive deficits are common in glioma patients following multimodality therapy, but the relative impact of different types and locations of treatment-related brain damage and recurrent tumors on cognition is not well understood. MATERIAL AND METHODS: In 121 WHO Grade II/IV glioma patients, structural MRI, O2-[18F]fluoroethyl-L-tyrosine PET-PET, and neuropsychological testing were performed at a median interval of 14 months (range, 1-214 months) after therapy initiation. Resection cavities, T1-enhancing lesions, T2/FLAIR hyperintensities, and PET-PET positive tumor sites were semiautomatically segmented and elastically registered to a normative resting state (RS) fMRI-based functional cortical network atlas and to the JHU atlas of white matter (WM) tracts, and their influence on cognitive test scores relative to a cohort of matched healthy subjects was assessed. RESULTS: T2/FLAIR hyperintensities presumably caused by radiation therapy covered more extensive brain areas than the other lesion types and significantly impaired cognitive performance in many domains when affecting left-hemispheric RS-nodes and WM-tracts as opposed to brain tissue damage caused by resection or recurrent tumors. Verbal episodic memory proved to be especially vulnerable to T2/FLAIR hyperintensities affecting the nodes of the left posterior temporal lobes. CONCLUSION: In order to improve radiotherapy planning, publicly available brain atlases, in conjunction with elastic registration techniques, should be used, similar to neuronavigation in neurosurgery.

P01.02 B. CASE REPORT: DISRUPTION OF RESTING-STATE NETWORKS AND COGNITIVE DEFICITS AFTER WHOLE BRAIN IRRADIATION FOR SINGULAR BRAIN METASTASIS

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BACKGROUND: Long-term survivors of whole brain radiation (WBRT) are at significant risk for developing cognitive deficits, but knowledge about the underlying pathophysiological mechanisms is limited. Therefore, we here report a rare case with a singular brain metastasis treated by resection and WBRT that survived for more than 10 years where we investigated the integrity of brain networks using resting-state functional MRI. MATERIAL AND METHODS: A female patient with a left frontal non-small cell lung cancer (NSCLC) brain metastasis had resection and postoperative WBRT (30.0 Gy in 3.0 Gy fractions) and stayed free from brain metastasis recurrence for 10 years, with a follow-up interval of 11 years. Structural, functional magnetic resonance imaging (fMRI) and amino acid [O-2-[18F]fluoroethyl-L-tyrosine] positron emission tomography (FET PET) were repeatedly acquired. At the last follow up, neurocognitive functions and resting-state functional connectivity (RSFC) using resting-state fMRI were assessed. Within-network and inter-network connectivity of seven resting-state networks were computed from a connectivity matrix. All measures were compared to a matched group of 10 female healthy subjects. RESULTS: At the 11-year follow-up, T2/FLAIR MR images of the patient showed extended regions of hyper-intensities covering mainly the bilateral dorsal frontal and posterior lobes. Compared to the healthy subjects, the patient performed significantly worse in all cognitive domains that included executive functions, attention and processing speed, while verbal episodic memory and processing speed were left mostly unaffected. The connectivity matrix showed a heavily disturbed pattern with a widely distributed, scattered loss of RSFC. The within-network RSFC revealed a significant loss of connectivity within all networks where the dorsal attention and frontoparietal networks were affected most severely. The inter-network RSFC was significantly reduced for the visual, somato-motor, and dorsal and ventral attention networks. CONCLUSION: As demonstrated here in a patient with a metastatic NSCLC and long-term survival, WBRT may lead to extensive white matter damage and cause severe disruption of the RSFC in multiple resting state networks. In consequence, executive functioning which is assumed to depend on the interaction of several networks may be severely impaired following WBRT apart from the well-recognized deficits in memory function.

P01.03 B. A QUANTITATIVE COMPARISON OF COGNITIVE PERFORMANCE AND PATIENT-REPORTED SYMPTOMS IN PREOPERATIVE LOWER-GRADE GLIOMA PATIENTS FROM TWO DUTCH HOSPITALS

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BACKGROUND: Co-cortical excision of lower grade glioma tumors is associated with prominent cognitive dysfunction. This study compared cognitive impairment and symptoms in lower grade glioma patients from two tertiary care neurosurgical centers in The Netherlands. MATERIAL AND METHODS: A total of 1117 patients with a lower grade glioma who underwent surgical treatment between 2007 and 2021 were included. We compared cognitive performance and patient-reported health status using the Dutch version of the Cognitive Impairment Scale (CIS) and the McGill Quality of Life Questionnaire (MQL) for higher cognitive functioning and quality of life, respectively. Follow-up was performed preoperatively and at 6 and 12 months postoperatively. Differences in demographic factors and scores at different time points were compared using Fisher’s exact test and Mann-Whitney U test. RESULTS: Patient characteristics were comparable between the two centers, except for a higher proportion of female patients in the Amsterdam University Medical Centers (AMC) cohort (56% vs 47%). No significant differences were found in the cognitive and functional outcomes between the two centers (CIS-fatigue (p=0.05), AMC vs AMH; p=0.62, p=0.61). CONCLUSION: Cognitive performance and quality of life outcomes in lower grade glioma patients were comparable between two tertiary care neurosurgical centers in The Netherlands.

P01.04 COGNITIVE FUNCTION TESTING IN PATIENTS WITH POSITIVE CSF CYTOLOGY FOR METASTATIC BRAIN TUMORS: A LARGE COHORT COMPARISON

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BACKGROUND: Patients with cytologically proven neurocysticercosis (NM) have completely normal CSF findings approximately 73% are detected after one LP, and 22.8% of patients with a positive CSF cytology had completely normal CSF findings. Generally accepted concepts about the frequency of CSF and clinical findings in patients with NM are based on biased estimates in the literature. No CSF chemistry or clinical finding reliably predicts the presence of NM, and almost a quarter of patients with cytologically proven NM have completely normal findings. In patients with positive CSF cytologies, about 73% are detected after one LP, and more than 90% after 3, but again these findings represent overestimates because of pervasive spectrum bias and differences in sample acquisition/handling. Better diagnostic techniques are desperately needed.