chemosensitivity of tumours. The concept was realized in the MUNICON-1 and -2 trials [Lordick F et al. Lancet Oncol 2007; Lordick et al. ASCO-GI 2011]. These trials prospectively confirmed that responders to induction chemotherapy can be identified by early metabolic imaging using FDG-PET. Continued neoadjuvant chemotherapy in the responding population resulted in a favourable outcome: The median overall survival was not reached in metabolic responders as compared to 26 months and 18 months in metabolical non-responders in MUNICON-1 and -2, respectively. MUNICON-1 showed that chemotherapy can be discontinued at an early stage in metabolic non-responders, thereby saving time and reducing side-effects and costs. Compared to previous studies one could delineate that the outcome of metabolic non-responders was at least not compromised by the early discontinuation of chemotherapy. MUNICON-2 showed that the addition of neoadjuvant radiation therapy in metabolic non-responders does not lead to an evident improvement of the poor prognosis, thus showing that early metabolic non-response indicates a dismal tumour biology.
Based on these results, the integration of FDG-PET can be recommended for further clinical studies. Important questions need to be addressed: Does metabolic non-response to induction chemotherapy stand for a definite unfavourable outcome or can further treatment modifications lead to improved response rates and outcome? Do patients with early metabolic non-response benefit from surgery? At this stage we feel that surgery offers a considerable amount of local control, at least, and is therefore indicated as the treatment of choice in metabolic non-responders. However, non-surgical local treatment, like chemoradiation, might offer the same magnitude of local control and clinical benefit in metabolic non-responders. These questions should be addressed in future randomized trials.

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Molecular Imaging for Personalised Treatment of Malignant Lymphoma

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Malignant lymphomas comprise a heterogeneous group of malignancies, including both indolent and highly aggressive diseases, and localised and disseminated disease presentations. Lymphomas are generally sensitive to therapy, and the goal of therapy is cure or very long-term disease control. High cure rates and long-term survival mean that patients, frequently young at diagnosis, are subject to the serious long-term of chemotherapy and radiotherapy, and the resulting excess morbidity and mortality is substantial. Management of malignant lymphoma is thus a balance between cure and toxicity, between over-treatment and under-treatment. The right treatment for the individual patient is an individualised treatment. With no access to highly accurate pre-treatment predictive markers, an individualised treatment should be tailored to the individual patient's risk and treatment response.
Molecular imaging, and in particular FDG-PET/CT, has become a cornerstone imaging procedure in most malignant lymphomas. The very high diagnostic accuracy at staging provides better pre-treatment assessment of disease extent and a better basis for accurate definition of highly conformal radiation therapy volumes. FDG-PET is the most powerful predictor of treatment response and prognosis in aggressive lymphomas, and the metabolic response assessment is possible very early during therapy, as opposed to response assessment by conventional imaging procedures. An early *in-vivo* treatment sensitivity test, rather than a late structural response assessment, makes it possible to adjust the individual patient's therapy according to the early treatment response. FDG-PET/CT is a key determinant of treatment response according to the revised international response criteria for aggressive lymphoma, due to a very high negative predictive value of post-therapy FDG-PET.
Other PET tracers than FDG have a potential role in the management of lymphoma, and they will be discussed briefly in this presentation, as well as the role of FDG-PET/CT in other clinical settings, such as follow-up/routine surveillance and the management of relapsed lymphoma. The presentation will also provide an overview of ongoing clinical trials investigating the role of PET-response adapted lymphoma therapy.

Society Session (Sun, 25 Sep, 16:45–18:15)
European Association of Neuro-Oncology (EANO)

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How to Improve the Extent of Surgery With Better Neurological Function Preservation

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Surgical removal of intrisinc cerebral neoplasms requires the combined efforts of a multidisclipinary team of neurosurgeon, neuroradiologist, neuropsychologist, neurophysiologist, and neurooncologists that all together contribute in the definition of the location, extension, and extent of functional involvement that a specific lesion has induced in a particular patient. Each tumour has induced particular and specific changes of the functional network, that varies among patients. This requires that each treatment plan should be tailored to the tumour and to the patient. When this is reached, surgery should be accomplished according to functional and anatomical boundaries, and has to aim to the maximal resection with the maximal patient functional preservation. This can be reached at the time of the initial surgery, depending on the functional organization of the brain, or may require additional surgeries, eventually intermingled with adjuvant treatments. The use of so called brain mapping techniques extend surgical indications, improve extent of resection with greater oncological impact, minimization of morbidity and increase in quality of life. To achieve the goal of a satisfactory tumour resection associated with the full preservation of the patients abilities, a series of neuropsychological, neurophysiological, neuroradiological and intraoperative investigations have to be performed. In this talk, we will describe the rationale, the indications and the modality for performing a safe and rewarding surgical removal of low grade gliomas by using these techniques, as well as the functional and oncological results.

238 INVITED

Quality of Life and Cognitive Function Monitoring

Abstract not received

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Stem Cells in Brain Tumours – Where Are We Going?

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Cancer stem cells (CSCs) are the rare population of undifferentiated tumorigenic cells that are responsible for tumour initiation, mainteinance and spreading. The existence of CSCs might explain why tumours are resistant to conventional therapies, which typically target the rapidly proliferating tumour cells but spare the slow dividing tumour stem cell population. Moreover, these cells seem to be intrinsically more resistant to apoptosis inducing stimuli. Indeed, resistance of brain tumours to current therapies may be related to the presence of CSCs, as shown by several studies that examined their role in the development of resistance to radiation and chemotherapy.
Hence, the discovery of CSCs has profound implications for the development of more effective treatments, since the selective targeting of these cells might lead to the eradication of the tumour. Different strategies towards CSC targeting are being investigated. One of such approach is forcing these cells to differentiate, rendering them vulnerable to therapy. Likewise, targeted therapies able to hinder the CSC survival machinery might prove to be higly effective. The main challenge towards this direction, however, remains the need for a full molecular characterization of CSCs. We are currently characterizing at different levels, including genome-wide expression of mRNA, microRNA and proteome profiling, CSCs from glioblastoma. Such extensive characterization may provide key information on the relavant pathways to be targeted for successfull therapies.
Novel CSC targeted therapy strategies in brain tumours might also arise from the recent demonstration that a significant portion of the vascular endothelium in glioblastoma derives from CSCs. Most importantly, the functional relavance of the CSC-derived endothelial vessels was established by the selective targeting of endothelial cells generated by CSCs in mouse xenografts, which resulted in tumour reduction and degeneration.
In conclusion, although the identification of CSCs is relatively recenbt, this research area appears extremely promising as it may significantly contribute to the rational design of new therapeutic approaches for brain cancer.