Conclusions: Patients with BM-UDP demonstrated comparable survival to those with BM-DP. The only prognosticator in our study for BM-UDP patients was KPS. Tailored therapeutic strategy with long-term palliative intent including WBRT and systemic therapies is reasonable for all BM-UDP patients with good performance status.

EP-1003

A comparison of 3D-Conformal RT (3D-CRT) and volumetric modulated arc therapy (VMAT) for meningiomas.

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Purpose/Objective: Meningiomas account approximately for 15-20% of all primary brain tumours in adults. Neurosurgical resection has been considered the first treatment of choice but definitive radiotherapy (RT) or postoperative RT for sub-totally resected tumours is an integral modality in the treatment of meningiomas. Although short term toxicity from RT is uncommon, the potential late RT effects can be severe. Radiation treatment planning for Meningiomas can be challenging. The ultimate goal is to spare the critical structures while delivering the prescribed treatment dose to the target volume. A planning comparison was undertaken of both planning techniques to establish if there was a dosimetric advantage of VMAT compared with 3D-CRT with particular reference to dose to PTV coverage and dose to normal brain.
Materials and Methods: 12 patients (8 females, 4 males) with Meningioma have been treated over the past 18 months. 60% of patients received RT following surgical resection. All patients were planned with 3D-CRT and VMAT, optimising dose to tumour. Total dose was 50.4Gy in 28 fractions. The GTV was delineated on CT/MRI co-registered images. A CTV-PTV margin of 0.7cm was added. The median treatment volume was 111cc (56-190). Analytical Anisotropic Algorithm (AAA) was used to calculate the plans.
Results: For the PTV, the comparison parameters include mean dose and conformation number. Calculation of the conformation number (CN) took into account the coverage of the PTV and volume of healthy tissue receiving dose above the prescribed dose. 1 is the ideal value.
Mean PTV dose: 3D-CRT 50.7Gy (range 41.3Gy-54.7Gy) ±4.2 (SD), VMAT 50.6Gy (range 50.3Gy-53.9Gy) ±1.3 (SD).
CN for 3DCRT = 0.446 (range 0.32-0.550)
VMAT = 0.823 (range 0.70-0.90).
Absolute improvement in CN in VMAT plans over 3D-CRT was 0.352 (range 0.206-0.508).
Normal brain doses :V45 3D-CRT 5.93% (range 3.3%-14.3%), VMAT 1.41% (range 0.8%-3.8%).
V10 3D-CRT 38.5% (range 24.2%-46.9%), VMAT 33.7% (range 24.7%-55.9%)
Conclusions: 3D-CRT and VMAT plans achieved equivalent PTV coverage. However, VMAT plans achieved superior homogeneity. The CN varies considerably leading us to conclude that the PTV coverage in the 3D-CRT plans is sub optimal. Although the CN for the VMAT is not ideal, it is substantially better. V 45Gy is better in the VMAT plans however, V10 is comparable.

EP-1004

1H-MR spectroscopy data changes in gliomas after radiation therapy

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Purpose/Objective: The aim of the work was to evaluate changes in NAA,Cho, lactate and lipid peaks after radiotherapy of partially operated gliomas as compared with 1H-MRS data gained before radiotherapy. Proton magnetic resonance spectroscopy gives information related to cell membrane proliferation, neuronal function metabolism and necrotic transformation of brain or tumor tissues. Spectroscopy added to MRI helps in tissue characterization of intracranial lesions, which could be of help in diagnostic of local brain disease. MRS could be helpful in the differentiation of high grade from low grade brain tumors, and perhaps in separating recurrence from radiation injury. Reduction in the resonance intensity of NAA (N-acetylaspartate) in the white matter of the brain in MR spectroscopy investigations reflects changes in metabolism or axonal density. Active demyelization produces changes in the resonance from choline. Lactate increases with inflammation due to anaerobic metabolism of inflammatory cells,associated mitochondrial dysfunction or occlusion of micro vessels. In normal brain NAA produces the highest peak in MRS examination. Gliomas malignancy tends to increase with decrease in NAA levels. Cho increases at a higher rate with more rapid development of neoplasm. Cho is one of the components of membrane metabolites and reflects membrane turnover. The presence or elevation of lactate and lipid has been attributed to rapid tumor growth and necrosis and indicates high tumor grade. Cho peak is identified as a marker of tumor cell proliferation.
Materials and Methods: 52 patients with gliomas with partial resection of tumors were subjected to MRI with 1H-MRS examination before and after radiotherapy (60 Gy, 2 Gy/day). NAA, Cho, lactate and lipid peaks before irradiations were chosen as basic values.
Results: Changes in peak intensity after radiotherapy depend on the malignancy grade of the tumor. Lactate and lipid levels were reduced after radiotherapy. NAA level increased. Cho changes were unpredictable especially for tumors with high grade of malignancy. Changes in NAA, Cho, lipid and lactate peaks could help in evaluation of radiotherapy effectiveness and in detection of early recurrence in gliomas.
Conclusions: Changes in peaks intensity after irradiation could be of prognostic values.

EP-1005

Bone marrow invasion by Hodgkinís disease: what is the role of radiotherapy in treatment strategy?

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Purpose/Objective: To determine role of irradiation in the treatment of patients with advanced Hodgkin's disease (HD) and bone marrow (BM) involvement.
Materials and Methods: 632 patients (pts) with advanced HD were included in this retrospective analysis. In all cases diagnosis of HD were confirmed by histology. Extranodal lesions diagnosed in 206 of 632 pts. Since 1992 whole body BM scintigraphy with 99m??-nanocolloids visualization is a part of routine staging. All cases of BM lesions revealed by scintigraphy were verified by biopsy, additional instrumental survey and by follow-up. All pts receive 4-8 cycles of chemotherapy with MOPP-ABVor ABVD or BEACOPP. In 45 pts visualized BM lesions were irradiated within 20Gy-50Gy (average dose 38.1Gy). BM lesions were outside radiation fields in another 30 cases.
Results: In 206 pts with extranodal disease BM invasion revealed in 75 (36%) cases: 51 pts had one-two BM lesions and another 21 – multifocal BM involvement. Overall (OS) and disease free (DFS) 10 year survival in pts with BM invasion (49% and 45%) were significantly (p=0,026) lower than in other pts with extranodal HD (62% and 65%). In pts with only BM involvement and those with BM and other extranodal invasion OS and DFS were comparable: 50% versus 47.5% and 48.5 versus 41%. On the contrary, OS was significantly different (p=0.014) in pts with 1-2 BM lesions (57%) and multifocal BM disease (26.5%). Irradiation of BM lesions significantly improve 10 year OS (p=0.00005) and DFS (p=0.006) in pts with HD: from 16% to 68% and from 23% to 58.5% correspondingly. It is especially important that this differences is preserved for pts with 1-2 BM foci: 10 year OS and DFS in cases of irradiated BM lesions are 72.7% and 57.5% versus 13.5% and 25% - in non irradiated BM lesions (p=0.0006 and p=0.054).
Conclusions:
1. In pts with advanced HD and BM involvement irradiation of visualized BM lesions significantly improve 10 year OS and DFS.
2. Visualization of BM lesions is of crucial importance for radiotherapy planning.

EP-1006

Methionine-uptake, delivered dose and control of the lesion after irradiation of malignant astrocytomas

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Purpose/Objective: MRIs provide us sufficient information regarding the tumor bulk, but a little for the infiltrating tumor cells. For the precise planning of the irradiation for infiltrating tumors such as gliomas, more biological imagings were required to delineate the target, and Methinoine(Met)-PET may be one of the candidates. In this study, we evaluated the correlations between Met-uptake before irradiation, delivered dose and control of the lesions to elucidate the optimal dose to control lesions owing to the Met-uptakes.