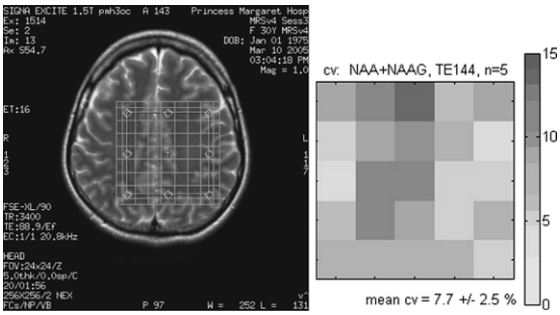
and after the MRS scans to assess potential motion-induced errors in positioning. No tissue segmentation was performed; a user-independent analysis routine (LCModel) was used to analyze all spectra. The coefficient of variation (CV) for each metabolite was determined voxel-to-voxel accross successive scans and the overall reproducibility calculated.
Results: Reproducibility of NAA, choline (Cho) and creatine (Cr) concentrations with respect to slice-averaged Cr was determined for both TEs, and myo-inositol (Ins) for TE = 30ms. The average CVs(%) for *in vivo* measurements, all voxels and all subjects, are: TE = 144ms; NAA: 12.1±9.2, Cho: 17.8±7.5, Cr: 20±12. The CVs (%) for TE = 30 ms are NAA: 21±12, Cho: 24±11, Cr: 21.0±9.3, Ins: 48±13. A typical example of a PRESS-VOI and the CVs obtained is shown in the accompanying Figures (NAA; central slice of one volunteer; TE 144 ms).
Discussion/Conclusion: The reproducibility of 3D ^{1}H-MRS in human brain, with inter-session anatomic variation removed, was established in a cohort of ten normal volunteers, for TE 30 and 144 ms. Such results are crucially important in determining a threshold of significance for MRSI time course studies of disease extent, progression and response to therapy.



1422 POSTER

Stereotactic radiotherapy for orbital malt lymphoma

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Background: MALT lymphoma is a common tumor in the orbital region. In some reports, almost 100% local control rate is able to be achieved by radiotherapy alone. Using conventional radiotherapy, there is some risk of causing a radiation cataract because we can't reduce the dosage of lens. So we started Stereotactic Radiotherapy(SRT) to reduce the risk of a radiation cataract for this tumor treatment in 1999. We will review our experiences with SRT in the treatment of orbital MALT lymphoma.
Methods and Materials: Seven patients with MALT lymphoma positioned next to the eye ball were treated with SRT from September 1999 to September 2003 at Fukushima Medical University Hospital. All patients' heads were fixed with a thermoplastic material (Brain LAB) and 6MV X-ray (CLINAC 2100C/D; Varian) was delivered with a micromultileaf collimator (m3; Brain Lab) and the planning system was Brain SCAN(Brain Lab). Total dose to the tumor was 30 Gy in 15 fractions.and the prescribed dose to the iso center of the tumor and the peripheral region was 2.5 Gy and 2 Gy, respectively.
Results: We treated seven cases of orbital MALT lymphoma with SRT, and were able to successfully control the tumors in all cases. After a mean follow-up of 40 months (66–20 months), all patients showed CR with no radiation cataract. There were some radiation conjunctivitis in all cases.
Conclusions: SRT is one possible treatment for orbital MALT lymphoma.

1423 POSTER

Preliminary evaluation of tolerance and local effectiveness of extracranial stereotactic radiosurgery and radioablation in patients with lung tumors

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Purpose: To evaluate treatment tolerance and tumor response in extracranial stereotactic radiosurgery and radioablation in patients with lung tumors.
Materials and methods: 35 patients (30 male and 5 female) median age 61 years, with lung tumors (primary lung cancer n = 13, local recurrences of lung cancer n = 9, lung metastases n = 13) were treated with extracranial stereotactic radiation (ESR). VAC-LOK cushion system was used for immobilization. Total doses applied by ESR ranged from 8–20 Gy, and were delivered using 3–10 beams. Patients were treated with radical (n = 22) and palliative intention (n = 13). Treatment toxicity was evaluated according to RTOG/EORTC system. Tumor response was evaluated using RECIST scale. Survival of the patients was analyzed using Kaplan-Meier method.
Results: The therapy was performed with no significant adverse symptoms. The most frequently observed acute reaction was fever which lasted 1–2 days after therapy. Seventeen pts (48%) responded to therapy in 15 pts (43%) the disease progressed, 3 pts (9%) were not evaluated for tumor response. One year actuarial progression-free survival was 36% and 1-year overall survival was 46%. Irradiated volume, radiation dose and dose per fraction did not significantly influenced survival.
Conclusion: Stereotactic irradiation of targets in the lung is an new attractive treatment modality with acceptable acute toxicity and local effectiveness. Based upon our initial experience the role of extracranial stereotactic radiotherapy in the curative and palliative management for lung tumor should be further investigated.

1424 POSTER

Intracranial arteries as organs at risk in fractionated stereotactic and intensity-modulated radiotherapy for skull base tumors

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Background: The purpose of this study was to examine the dose distribution in conformal fractionated stereotactic radiotherapy (FSRT) and intensity-modulated radiotherapy (IMRT) of skull base tumors with regard to the large skull base/intracranial arteries. Irradiation of these blood vessels might contribute to arteriosclerosis and therefore brain perfusion disturbances.
Material and Methods: Retrospective review of all patient charts for the treatment period September 2002 – November 2004. Overall, 56 patients with skull base tumors adjacent to at least one major artery (which therefore had to be included into the clinical target volume) were identified. Thirty-two of these patients had meningiomas. The strategy for all patients was to perform FSRT by use of a modified linear accelerator and the BrainLAB system. The dose per fraction was 1.8 Gy. The planning target volume (PTV) was to be enclosed by the 95% isodose, i.e. minimum PTV dose was 1.71 Gy. The maximum dose was 107% (1.93 Gy) and dose limits were applied to established organs at risk such as brain stem, optic nerves and chiasm, and hypothalamus. The maximum dose to these structures was 1.85 Gy. No dose limits were defined for the intracranial arteries. If FSRT planning failed to meet any of these criteria, IMRT was planned with the same system and objectives. The maximum dose to both internal carotid arteries and the basilar artery was determined retrospectively.
Results: The median PTV was 31 ccm, the median minimum dose to the PTV 96%. In 31 patients (55%, median PTV 23 cm^3) the FSRT plan fulfilled all evaluation criteria. None of these patients had a dose >105% in one of the large skull base/intracranial arteries. Twenty-five patients (45%, median PTV 39 cm^3) had unsatisfactory FSRT plans and thus IMRT planning performed. This resulted in satisfactory plans in 14/25 (56%, median PTV 35 cm^3), However, in 11/25 patients (44%, median PTV 85 cm^3) no plan satisfying all our criteria could be calculated. Only in this group of 11 patients, high maximum doses to the blood vessels were observed. One patient had >110% to one carotid artery and 6 others had 106–110% to a large artery. The median PTV of these 7 patients was 121 cm^3, the median dose gradient within the PTV 29% ($p = 0.04$ and <0.001, respectively, when compared to the 14 patients with satisfactory IMRT plans). Three out of 4 paranasal sinus tumors belonged to this challenging group.
Conclusions: The large skull base/intracranial arteries should be considered as organs at risk in IMRT planning of skull base tumors if a homogenous dose distribution of 95–107% within the PTV can not be obtained because the PTV is challenging with regard to size or inclusion of large air cavities.

1425 POSTER

Stereotactic body radiotherapy of limited stage non-small cell lung cancer: results of a Danish phase-II study.

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Background: A large number of patients with technical operable limited stage non-small cell lung cancer (NSCLC) are considered inoperable due