Materials and Methods: Between April 2008 and September 2013, 33 patients with high grade glioma were treated with CRT using IMRT boosts in combination with HBO therapy. Twenty four (73%) patients have a tumor with WHO classification of Grade IV, and 9 (27%) patients have a Grade III. Before CRT, tumor resection was performed in 26 (79%) patients, and tumor biopsy was in 7 (21%) patients. The protocol of RT was as follows: first, three-dimensional conformal RT were delivered 40 Gy/20 fractions (fr)/daily 2.0Gy to the GTV and surrounding edema plus 1.5 to 2.0cm as the clinical target volume extended (CTV-e). Continuously, the IMRT boosts using Cyberknife were delivered 28 Gy/8 fr/daily 3.5 Gy to the GTV and 16 Gy/8 fr/daily 2.0 Gy to the surrounding edema defined as the clinical target volume annulus (CTV-a). HBO therapy was performed immediately before each IMRT boost session, and was a single treatment for 60 minutes in a monoplace HBO chamber pressured with 100% oxygen to 2.0 atmospheres absolute. Temozolomide as a concurrent or adjuvant chemotherapy was administered in 29 (88%) patients. Feasibility and efficacy of this combined therapy were retrospectively analyzed.

Results: Planned RT dose was completed in all patients, while HBO therapy was terminated in 2 (6%) patients due to aural pain of Grade 2 at first and second session. Radiation necrosis of the brain of Grade 2 occurred in 3 (9%) patients. Acute and late toxicities were mild, No Grade 3 or higher toxicity was observed in any of the patients. The median follow-up duration was 17 months. The median local progression-free survival time was 16 months. Median overall survival times were 23 months with Grade IV and 30 months with grade III, respectively. Eastern Cooperative Oncology Group (ECOG) performance status of 0-1 resulted in better overall survival rates (p<0.01).

Conclusions: The combined therapy of CRT using IMRT boosts in combination with HBO therapy was a feasible and promising modality for high grade glioma, and the results justify further evaluation to clarify the benefits of this treatment regimen.

EP-1334
11C-methionine PET for target definition of recurrent glioblastoma multiforme in re-radiation therapy planning
M. Matsuo1, Y. Shibamoto1, K. Miwa2, S. Ogawa3, H. Nishibori1, T. Murali, C. Sugie1, J. Shinoda1
1Nagoya City University Graduate School of Medical Sciences, Radiology, Nagoya, Japan
2Chubu Medical Centre for Prolonged Traumatic Brain Dysfunction, Neurosurgery, Minokamo, Japan
3Kizawa Menorial Hospital, Radiology, Minokamo, Japan

Purpose/Objective: The standard tools in the target volume delineation of glioblastoma multiforme (GBM) are gadolinium-enhanced T1-weighted (Gd-MRI) and T2-weighted MRI (T2-MRI); however, neither contrast enhancement nor edema are sufficient to accurately measure tumor extension in recurrent GBM. C11-methionine PET (MET-PET) is a well-established technique for evaluating the tumor extent for the radiation treatment planning in brain tumor and there is a relationship in localization between the MET-PET uptake and the grade of malignancy in GBM. The purpose of this work is to investigate the recognition of the tumor extent and to define the optimal margin to Gd-MRI and T2-MRI in the re-irradiation planning of recurrent GBM by comparison to MET-PET.

Materials and Methods: CT, MRI, and MET-PET were separately performed within 2 weeks in 25 patients with recurrent GBM for the re-irradiation planning. The Gd-MRI clinical target volume (CTV) (CTV-Gd) and the T2-MRI CTV (CTV-T2) were defined as the contrast-enhanced area on Gd-MRI and the high intensity area on T2-MRI, respectively. We defined CTV x mm (x= 5, 10, 15, 20) as x mm outside the CTV. MET-PET CTV (CTV-MPET) was defined as the area of MET accumulation, which was higher than that of normal tissue on MET-PET. A threshold value of CTV-MPET for the tumor/normal tissue index of 1.3 was considered for malignant activity. We calculated the sensitivity and specificity of CTV-Gd and CTV-T2 by comparison to CTV-MPET served as the gold standard in this study.

Results: The average CTV-MPET, CTV-Gd, and CTV-T2 volume were 59, 56, and 222 ml, respectively. There was no significant correlation between each type of the CTV in its size. Sensitivity of CTV-T2 (98%) was significantly higher than CTV-T2 (88%), and there was no statistically significant difference in sensitivity between CTV-T2 5 mm and CTV-T2 10, 15, and 20 mm. Sensitivity of CTV-Gd 20 mm (97%) was lower than that of CTV-T2 5 mm. The specificity of CTV-Gd and CTV-T2 significantly decreased in accordance with increases in the margin outside the CTV-Gd and CTV-T2.
Conclusions: In patients with recurrent GBM, CTV-Gd and CTV-T2 differed considerably from CTV-MPET. At least 5 mm margin to CTV-T2 would be necessary in the target volume delineation of recurrent GBM to cover CTV-MPET in the re-irradiation planning.

**EP-1335**

Deformable MRI fusion for intracranial SRS: Can we trust?  
H. Cacdar1, E. Kucukmorkoc1, N. Kucuk1, A. Altinok1, H. Acar1, M. Doyuran1  
1Medipol University, Radiation Oncology, Istanbul, Turkey

**Purpose/Objective:** The aim of this study is to evaluate the reliability of MRI fusion for the determination of target volume when performing CT based intracranial stereotactic radiosurgery.

**Materials and Methods:** Patients treated with CT based intracranial stereotactic radiosurgery with various diagnoses are included in the study. All patients were immobilized using stereotactic thermoplastic masks prior to simulation. The planning CT was obtained both with and without iv contrast with 1mm slice thickness. The images obtained were then fused with 3D, T1 weighted MR images with contrast by two different platforms (Eclipse 10.0, Velocity 3.0 rigid and Velocity 3.0 deformable). The target volume was contoured by the same physician in four different image sets (planning CT with iv contrast, planning CT fused with MRI by Eclipse software, planning CT fused with MRI with Velocity rigid fusion algorithm software, planning CT fused with MRI with Velocity deformable fusion algorithm software). The target volumes delineated on planning CT with iv contrast were determined as reference volume. The intersections of all volumes delineated with three different fusion algorithms were produced and ratios of the intersections were calculated. Values close to one was determined as the unit of similarity and were compared with Paired-Samples t test. The center of each target was determined and offsets were calculated according to the reference.

**Results:** Eight intracranial targets were evaluated. All of the targets evaluated were clearly visualized in the planning CT with iv contrast. Six of these lesions were metastases while the remaining two were meningioma. The median volume of the delineated targets on the planning CT with iv contrast was 9.53 cc. The intersecting volume with three different fusion algorithms (Eclipse fusion, Velocity rigid fusion and Velocity deformable fusion) was 8.08, 6.74 and 6.84 cc respectively. The ratios of the intersections were 1.20, 1.42 and 1.40 respectively. The maximal offset in each fusion was in Y axis and the most in Velocity deformable fusion (mean 0.3 cm; 0.02-0.76cm). There was difference between offsets for the lesion which are close to or away from the bone.

**Conclusions:** Determining the target volume with MRI fusion when performing CT based intracranial stereotactic radiosurgery may not be very reliable compared to obtaining a planning CT with iv contrast. Careful attention must be paid to this as this might affect not only the treatment outcomes but also the late toxicity.

**EP-1336**

Salvage radiosurgery for selected patients with recurrent malignant gliomas  
M. Martínez Carrillo1, I. Tovar Martin1, M. Zurita Herrera2, R. Del Moral Ávila1, R. Guerrero Tejada1, E. Saura Rojas1, J. Osorio Ceballos1, J.P. Arrebola Moreno1, J. Expósito Hernández2  
1Hospital Ciudad de Jaen, Radiation Oncology, Jaen, Spain  
2Hospital Universitario Virgen de las Nieves, Radiation Oncology, Granada, Spain

**Purpose/Objective:** To analyse the survival after salvage radiosurgery and to identify the prognostic factors

**Materials and Methods:** We retrospectively reviewed 87 consecutive patients, with recurrent high-grade glioma, that underwent stereotactic radiosurgery between 1997 and 2010. We evaluated the survival after initial diagnosis and after re-irradiation. The prognostic factors were analysed by bivariate and multivariate Cox regression model.

**Results:** The median age was 48 years old. The primary histology included anaplastic astrocytoma (47%) and glioblastoma (53%). A margin dose of 18Gy was administered in the majority of cases (74%). The median survival after initial diagnosis was 21 months (39 months for anaplastic astrocytoma and 18.5 months for glioblastoma) and after re-irradiation was 10 months (17 months for anaplastic astrocytoma and 7.5 months for glioblastoma). In the bivariate analyses the prognostic factors significantly associated with the survival after re-irradiation were: age, tumour and treatment volume at recurrence,recursive partitioning analyses classification, karnofsky performance score, histology, and margin to the planning target volume. Only the last four showed significant association in the multivariate analyses.

**Conclusions:** stereotactic radiosurgery is a safe and may be an effective treatment option for selected patients diagnosed with recurrent high-grade glioma. The identified prognostic factors could help to individualise the treatment.

**EP-1337**

A decade of treating Kaposi’s sarcoma: presentation, treatment and outcomes  
P. Scott1, V. Vanderpuye1, C. Edusa1, N. Aryeetey1  
1Korlebu Teaching Hospital, National Centre for Radiotherapy and Nuclear Medicine, Accra, Ghana

**Purpose/Objective:** Kaposi’s sarcoma (KS) is a low grade malignant vascular endothelial tumor which has a viral etiology; KS herpes virus (KSHV). It was found to be endemic in the Central and Southern Africa. Sporadic cases are found in the Mediterranean region. With the advent of HIV- AIDS epidemic, the incidence of Kaposi’s sarcoma has increased. The Aim of the study is to determine the demographics of the disease, treatment and their outcomes.

**Materials and Methods:** The study is a retrospective study of patients with Kaposi’s sarcoma who presented to the unit from 2004-2013. It evaluated all histologically confirmed cases of KS for demographic information, HIV status, degree