oligodendroglioma and the rest had GBM. There was a clear inverse correlation between Ki-67 percentage staining and overall survival. In patients with Ki-67 ≤ 30% (n=18), 5 year survival was approximately 50% compared to those with Ki-67 >30% (n=60) with survival of 10% (logrank P-value 0.02, HR 0.39, 95% CI 0.17 – 0.88).

Conclusion: There appears to be a correlation between percentage staining of Ki-67 and overall survival in patients with HGG. Percentage staining of Ki-67 > 30% appears to predict for poorer survival in HGG.

EP-1112

Optic toxicity in radiation treatment of meningioma: a retrospective study in 213 patients

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Purpose or Objective: Background and purpose:In this retrospective evaluation, we correlated radiation dose parameters with occurrence of optical radiation-induced toxicities.

Material and Methods: Patients and methods:213 meningiomapatientsreceived radiation between 2000 and 2013. Radiation dose and clinical datawere extracted from planning systems and patients' files. The range of follow-up period was 2-159 months (median:75 months).

Results: Results:Median age of patients was 60 years (range: 23-86). There were163 female and 50 male patients. In 140 cases, at least one of the neuro-optic structures (optic nerves and chiasm) was inside the irradiatedtarget volumes. We found 15 dry eye (7%) and 24 cataract (11.2%) cases. Median dose to affected lachrymal glands was 1.47Gy and median dose to affected lenses was1.05Gy. Age and blood cholesterol level in patients with cataract were significantly higher. Patients with dry eye were significantly older. Only 2 patients with visual problems attributable to radiation treatment (RION) were seen. They did not have any risk factors. Maximum and median delivered doses to neuro-optic structures were not higher than 57.30Gy and 54.60Gy respectively.

Conclusion: Conclusion:Low percentages of cases with radiation induced high grade optic toxicities show that modern treatment techniques and doses are safe. In very few patients with optic side effects, doses to organs at risk were higher than the defined constraint doses. This observation leads to the problem of additional risk factors coming into play. The role of risk factors and safety of higher radiation doses in high grade meningiomas should be investigated in more comprehensive studies.

EP-1113

Light seeing in radiotherapy of patients with brain tumours and head and neck malignancies

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Purpose or Objective: Evaluating the radiation doses delivered to different parts of the visual pathway for better understanding of light vision in radiotherapy patients.

Material and Methods: 20 patients with brain tumors and head and neck malignancies who received radiotherapy and experienced any kind of light or color vision during radiation treatment. All the components of visual pathway including lenses, eyeballs, retinas, optic nerves, chiasm, optic tracts, optic radiations and visual occipital cortexes were contoured.

Results: 11 patients were male (55%) and 9 were female (45%). Age median was 56 years. The range of dose/fraction and total prescribed dose were 1.8-3 Gy and 36-70.4 Gy respectively. Twelve patients reported white, 11, blue, 2, yellow and 2, gray color visions. Seven patients experienced more than one color, while 2 patients did not attribute any special color to their light seeing experiences. Four patients had a kind of smell experience and 1 patient had a taste experience.

Conclusion: Cherenkov radiation in eye ballsmay be the origin of light seeing experiences in patients receiving radiation treatment for head and neck malignancies, since treatmentsareperformed with ionizing radiations with energycapable to produce this effect. Also this effectmay be due to phosphenes produced by radiation treatment in different parts of the visual pathway (from retina to visual cortex). In order to investigate the mechanism of this phenomenon in patients and to define a radiation dose threshold – if the origin of this phenomenon is phosphenes produced in visual pathway – larger studies are needed.

EP-1114

Clinical outcomes in modern management of infratentorial ependymoma

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Purpose or Objective: Ependymomas are central nervous system (CNS) tumors that due to their rare prevalence have considerable controversy regarding their prognostic factors and clinical management. As such, many of the reported series involve accumulation of patient data that spans many decades, making current management decisions difficult. In this study, we report the outcomes and possible prognostic factors of patients with histologically confirmed infratentorial ependymomas treated in the modern era.

Material and Methods: A retrospective chart review of our patient registry was conducted to identify 15 patients diagnosed with infratentorial ependymoma between 2007—2013. Mean age at diagnosis was 29 years (range 1.0—79.0 years). There were 8 males and 7 females, with headache being the most common presenting symptom among the entire cohort. Eleven were newly diagnosed with ependymoma and the remaining 4 were recurrent patients who had failed primary therapy. Of the newly diagnosed patients, all received surgery and post-operative radiation therapy (RT) with a mean dose of 54.3 Gy (range 45.0—59.4 Gy). Two also received chemotherapy. Patients in the recurrent group experienced only local recurrences after initial treatment and underwent salvage RT with a mean dose of 45.6 Gy (range 15.0—59.4 Gy).

Results: With a mean follow-up time of 15 months (range 1.4—61.7 months) for the cohort, a significant difference in overall survival (OS) was found between primary and recurrent patients (p=0.0082). Overall, 9 patients (60%) had no acute complications with the remainder Grade I or II following initial treatment. All were free of late complications throughout follow-up. Moreover, there were no statistically significant differences in OS or local control when tumor size or RT dose were analyzed.

Conclusion: Our findings indicate that recurrence is a prognostic factor for decreased OS in patients with infratentorial ependymomas. Involved field radiation therapy following surgical resection of these tumors offers high local

control rates and may ultimately improve OS. The combination of surgery followed by RT appears to be the current standard of care.

EP-1115

Stereotactic radiosurgery for brain metastases: neuropathological report of three autopsy cases

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Purpose or Objective: To elucidate the radiobiological effects of stereotactic radiosurgery (SRS) on brain metastases using autopsy cases.

Material and Methods: From 1995 to 2013, 9 brain specimens from 3 patients were available. They underwent autopsy after SRS in our hospital. These specimens were all brain metastases. The timing of autopsy was from 7 days to 20 months (median 10 months) after SRS. The 9 tumors received a margin dose of 16–20 Gy (median 20 Gy) at the 40–75% isodose line (median 40%), with a maximal dose of 16–50 Gy (median 45 Gy). Histopathological investigations were performed. The specimens were fixed in 20% neutral buffered formaldehyde and embedded in paraffin. Hematoxylin-eosin, Azan-Mallory, and Bodian stains were used. Immunohistochemical reactions included glial fibrillary acidic protein, alpha-smooth muscle actin, CD34, and CD68 antigens. Ki67 and p53 reactions were also used.

Results: The first case was a 59-year-old man diagnosed with 2 brain metastases from renal cell carcinoma. Both lesions were irradiated with SRS. He received SRS 4 times after the first SRS. At 1 week after the last SRS, he died from carcinomatous lymphangiosis. The second case was a 63-year-old man diagnosed with 2 brain metastases from lung cancer. Both lesions were irradiated with SRS plus whole brain radiotherapy (WBRT). Seven months later, he died from carcinomatous peritonitis. The third case was a 35-year-old woman diagnosed with 2 brain metastases from breast cancer. Both lesions were irradiated with WBRT plus SRS. When one of the lesions enlarged 1 year later, repeated SRS was performed. At 7 months after reirradiation, she died from carcinomatous lymphangiosis. In the first case, necrosis and viable tumor cells were observed mainly in the center of the lesion at 1 week after SRS, while apoptosis and fibrosis were observed in a small part of the lesion. Glial cells and neutrophilic leukocytes had accumulated around the lesion. In the lesions at 2 months after SRS, tumor cells and fibrosis were not observed; only macrophages and glial cells were observed in the SRS irradiated field. In the second case, fibrosis was observed at the periphery of the center necrotic region at 7 months after SRS. In the third case, almost all parts of the lesions were replaced with fibrosis at 19 months after SRS, while small foci of viable tumor cells, a large number of glial cells, and macrophages were observed around the fibrotic area.

Conclusion: In the tumors, apoptosis was only observed at 1 week after SRS. The time of fibrosis initiation varied in each case. Around the tumors, neutrophilic leukocytes and glial cells accumulated within 1 week after SRS. Macrophages accumulated at least 2 months after SRS. Stromal changes remained for a considerable period of time. It was remarkable that fibrosis occurred very soon after SRS, and other observations were generally compatible with previous reports.

EP-1116

Staged radiosurgery for petroclival meningiomas: preliminary results

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Purpose or Objective: The goal of surgical treatment of meningiomas is the total resection of the tumour. The complete removal of petroclival meningiomas can be difficult because of their proximity to cranial nerves. Stereotactic radiosurgery (SRS) is a well established treatment for many patients with intracranial meningiomas, either in the exclusive or adjuvant setting. However, SRS of large meningiomas might be associated with significant morbidity. Under these circumstances s-SRS has the potential to deliver sharply focused high doses per fraction without increasing the risk of toxicity.The aim of this study is to prospectively evaluate the feasibility of s-SRS for petroclival meningiomas, including large volume lesions.

Material and Methods: Between September 2011 and October 2013 at our Institute, s-SRS using the CyberKnife was prospectively performed on 30 patients (24 women and 6 men, men, mean age 57 years) with petroclival meningiomas. Patients with atypical or malignant meningiomas and those who had received prior radiotherapy were excluded. The average tumor volume was 11,86 cm3 (range 2,2–126,3 cm3); the average tumor prescription dose was 24,4 Gy, the number of fraction was 4 or 5.

Results: After a median follow-up of 30 months (range 13-36 months) the overall tumour control rate was 100% (25 patients with stable disease, 3 patients with partial response and 2 patients with complete response). Tumor control rates at 2 and 3 years was 100%. Among 28 patients who were symptomatic before staged radiosurgery, neurological follow-up showed an improvement in 43%, stable clinical course in 43% and a persistent deterioration of clinical symptoms in 14% of the patients. A transient neurological deterioration was observed in 11% of patients within the first year after treatment.

Conclusion: Our findings show that s-SRS using the CyberKnife is a safe and effective option in the treatment of large-volume petroclival meningiomas. A good tumour control and a low morbidity rate was achieved in our series, either as a primary or adjuvant approach. Long-term follow-up is warranted to confirm these results.

EP-1117

Frameless radiosurgery for acoustic schwannoma: a five-year experience

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Purpose or Objective: Frameless radiosurgery (SRS) plays an important role in the management of acoustic neuromas. This retrospective study aims to evaluate tumor control using this technique.

Material and Methods: Thirty four patients with unilateral acoustic neuromas (vestibular schwannomas) who underwent linear accelerator-based frameless SRS at low dose (12 Gy) to the tumor from July 2008 to February 2015 were evaluated. Twenty-one patients were male and 13 patients were female. The median age was 62 years (range 23-84) with a median follow-up period of 12.4 months (range 1-60). Treatment volume was 0.1 to 3.8 cm3 (median 0.93 cm3).

Results: Preliminary results from follow-up magnetic resonance imaging (MRI) showed: the tumor of 15 patients decreased in diameter, no changes was found in 14 and the tumor increased slightly in only one patient. All patients are alive, except for 1p who died from intercurrent disease 2 years after radiosurgery. Among 23p with acufeno, full improvement was demonstrated in four. There were no reported complications related to treatment.