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Purpose or Objective: The current standard of care for newly diagnosed papillary thyroid carcinoma invading the trachea is surgical resection followed by radioactive iodine therapy (RAI) and thyroid stimulating hormone suppression. However, the local recurrence rate is high. Several studies reported adjuvant external beam radiotherapy (EBRT) reduced the local recurrence. The benefit of adjuvant EBRT remains controversial. We evaluated the effect of adjuvant EBRT on local control in a single institution database.

Material and Methods: Between May 2003 and October 2013, 36 patients with locally advanced papillary thyroid carcinoma invading the trachea (pathologic stage T4) were treated with surgical resection. After surgery, 16 patients received adjuvant EBRT using intensity modulated radiation therapy followed by RAI, and 20 patients were treated with RAI alone. The age range was 36-87 years (median 64 years). EBRT doses ranged from 30-66 Gy (median 60 Gy). There was no statistically significant difference in terms of clinical characteristics between the EBRT and no EBRT groups.

Results: Median follow up was 26.6 months (range, 16.5-40.1) in EBRT group, and 43.9 months (range, 13.9-117.6) in no EBRT group. There was no local or distant failure in EBRT group during the follow up. There were five local failures and one distant failure in no EBRT group. The two-year & five-year local failure free survival rates were 95.0% and 49.8% in no EBRT group. There were acute grade 2 esophagitis (n=1) and grade 2 skin reaction (n=3). There were no grade 2 late complications in EBRT group.

Conclusion: Adjuvant EBRT was found to be an effective treatment for local control in papillary thyroid carcinoma invading the trachea with tolerable complications, in a study at a single institution. Longer follow up will be required to demonstrate outcomes for tumor control and complications

EP-1110

Combination of RT and cetuximab for aggressive, high-risk CSCC of h&n: a propensity score analysis

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Purpose or Objective: Locally advanced, high-risk cutaneous squamous cell carcinoma (CSCC) of the head and neck are typically aggressive and treated with combined modality therapy. These patients tend to be older, frail with multiple comorbidities which makes chemotherapy difficult to tolerate. Cetuximab is a monoclonal antibody against the EGFR receptor and has demonstrated activity in CSCC. We investigate the safety and efficacy of combined therapy in advanced, high risk CSCC with the addition of cetuximab.

Material and Methods: Patients were identified with locally advanced CSCC with high risk or very high risk features who were treated with cetuximab and radiotherapy between 2006 and 2013. A matched cohort over the same time period was identified who were treated with radiation. Propensity score analysis was performed with weighted factors including: Charlson Comorbidity Index score (age-adjusted), age, KPS, primary location, T and N stage, recurrent status, margin status, LVSI, PNI and grade. Overall survival, progression free survival and freedom from local or distant recurrence were evaluated with the Kaplan-Meier method for both the unadjusted and propensity score adjusted groups. Multivariate analysis was performed using cox proportional hazard models.

Results: 29 patients were in the cetuximab and 39 in the control group. Median follow-up for alive patients was 30 months. Patients in the cetuximab group were more likely to have advanced N stage, positive margins and recurrent disease. After propensity score matching the groups were well balanced. OS was not statistically significant between the two groups but depicted in Table 1 below there were approximately 20% more long term survivors in the cetuximab group after matching. Local control was 76% and 79% in the cetuximab and control groups, respectively. The rate of distant metastases was lower in the cetuximab group 6.8% versus 10%. The incidence of grade 2-3 toxicity was 41% in the cetuximab group. There was one grade 3 cetuximab acneiform rash, one grade 4 dysphagia and no grade 5 toxicity.

Table 1 Overall Survival Probabilities by year in both unadjusted and Propensity Score Adjusted Cohorts

Years:		1	2	3	4	5
Unadjusted	Cetuximab	96%	74%	74%	74%	74%
	No Cetuximab	93%	85%	75%	69%	69%
Propensity Score Adjusted	Cetuximab	98%	80%	80%	80%	80%
	No Cetuximab	81%	73%	66%	61%	61%

Conclusion: Although limited by small numbers, we found that there were more long-term survivors and less distant metastasis in the cetuximab group. This is the largest report of CSCC patients treated with cetuximab. In the absence of prospective data, we believe this data reveals that the addition of cetuximab is well tolerated and reveals signs of efficacy in this typically poor performing group of patients and should be pursued in clinical trials.

Electronic Poster: Clinical track: CNS

EP-1111

A cut point for Ki-67 proliferation that predicts for poorer survival in high-grade glioma

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Purpose or Objective: Ki-67 index is used to assess cell proliferation during histopathological assessment of various tumours including high grade gliomas (HGG): Anaplastic astrocytoma, Anaplastic Oligodendroglioma and Glioblastoma Multiforme (GBM). We aimed to determine if there is a correlation between percentage staining of Ki-67 and overall survival in patients with HGG and determine a cut-point for percentage staining of Ki-67 that predicts for poorer survival.

Material and Methods: Records of adult patients diagnosed with HGG on histopathological specimens examined at the Institute of Clinical Pathology and Medical Research at Westmead Hospital, NSW, between 1st of January 2002 and 30th of July 2012 were identified. The specimens of these patients were examined for quantification of Ki-67 staining by two independent pathologists. Patient, disease, treatment and survival data were collected from hospital and cancer care service records. Descriptive statistical analyses were performed on the patient, disease and treatment data. Survival curves were constructed using Kaplan Meir methods. Using the minimum p value approach we obtained a cut-point for Ki-67 percentage staining that predicts for poorer survival.

Results: Of the eligible 78 patients (median age = 57, range 18 - 87) 46 (59 %) were males and 32 (41%) were females. 59 (76%) patients were of ECOG performance status 0 -1. Seven patients had anaplastic astrocytoma or anaplastic

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 \leq 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 meningioma patients received radiation between 2000 and 2013. Radiation dose and clinical data were extracted from planning systems and patients' files. The range of follow-up period was 2-159 months (median: 75 months).

Results: Median age of patients was 60 years (range: 23-86). There were 163 female and 50 male patients. In 140 cases, at least one of the neuro-optic structures (optic nerves and chiasm) was inside the irradiated target volumes. We found 15 dry eye (7%) and 24 cataract (11.2%) cases. Median dose to affected lacrimal glands was 1.47 Gy and median dose to affected lenses was 1.05 Gy. 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 57.30 Gy and 54.60 Gy respectively.

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 balls may be the origin of light seeing experiences in patients receiving radiation treatment for head and neck malignancies, since treatments are performed with ionizing radiations with energy capable to produce this effect. Also this effect may be due to phosphores 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 phosphores 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