Purpose: Tumour volumetric changes can be observed during radical chemo-radiotherapy (CRT) for locally advanced non-small cell lung cancer (NSCLC); but it is unclear whether these changes are predictive of outcomes. This study aims to a) examine whether the magnitude of tumour regression is correlated with disease control and survival; b) explore the potential difference between adenocarcinoma (AC) and non-adenocarcinoma (non-AC) NSCLC subtypes.

Methods and Materials: Primary tumour volumes were recorded and analyzed on weekly serial cone beam computed tomography (CBCT) images during CRT. Patients treated between January 2006 to June 2007 at our institution1. Tumour volume regression was divided into three categories: < 10%, 10-30%, and ≥ 30%. Outcome measures included locoregional failure-free survival (LRFFS), distant failure-free survival (DFFS), and overall survival (OS), which were calculated using the Kaplan-Meier method. Univariate analysis (UVA) and multivariate analysis (MVA) of LRFFS, DFFS and OS were performed using the Cox regression model. Further analysis was performed comparing AC and non-AC subgroups.

Results: Forty-five patients with Stage II-III NSCLC were included. Median age was 64 years (range: 43 - 79 years). Median follow up was 22.1 months for all patients, and 90 months for alive patients (range: 0.9-108 months). The distribution of 7th Ed. AJCC stage was as follows: Stage IIB (37%) 8.9%; IIA 66.7%; IIIA 24.4%. Twenty patients (44.4%) had AC, while 25 patients (55.6%) had non-AC histologies. All patients received concurrent chemotherapy. Twenty-eight patients (62.3%) received a total radiation dose of ≥ 60 Gy, 15 patients (33.3%) received 45 Gy as part of trigeminal therapy. Twenty-two patients underwent treatment completion. In UVA for all patients, young age (p = 0.02) and AC histology (p = 0.03) were significantly associated with better LRFFS; young age was significantly associated with better DFFS (p = 0.048) and OS (p = 0.04). For patients with AC histology, MVA showed that ≥ 30% regression by fraction 15 and younger age were significantly associated with better LRFFS (p = 0.007, 0.006 respectively), DFFS (p = 0.007, 0.004), and OS (p = 0.02, 0.004). For patients with non-AC histology, ≥30% regression by treatment completion was significantly associated with better LRFFS (p = 0.02), but none of the factors had any significant correlation with DFFS or OS.

Conclusions: Evaluation of primary tumour regression on CBCT images during CRT may be predictive of treatment response. Early tumour regression, as indicated by ≥30% regression by fraction 15, was shown to be associated with better outcomes for adenocarcinoma histologic subtype in our study. This observation may provide insight into when, how and in which patients to best utilize adaptive radiotherapy.


163 CUMULATIVE INCIDENCE OF BRAIN METASTASIS AFTER DIAGNOSIS OF NON-SMALL CELL LUNG CANCER: ESTIMATES FROM A REGIONAL CANCER CENTRE COHORT
Adrijana D’Silva1, Shannon Otuka1, Haoceng Li1, Jackson Wu1, Don Morris1, Gwyn Bebb1
1Tom Baker Cancer Centre, Calgary, AB
2University of Calgary, Calgary, AB

Purpose: Non-small cell lung cancer (NSCLC) is the most common primary cancer to metastasize to the brain. However, the incidence or likelihood of developing brain metastasis, after initial diagnosis and treatment, is generally unknown, as provincial population-based cancer registries do not routinely capture metastatic relapses. At our centre, a retrospective cohort study has gathered longitudinal clinical data for all NSCLC patients consulted since 1999 (Glans-Look Lung Cancer Database). In this report, we describe the cumulative incidence of brain metastasis observed for NSCLC patients diagnosed between 1999 and 2010.

Methods and Materials: Clinical data, including date of brain metastasis diagnosed by CT/MR imaging, is abstracted from electronic and paper charts by full time research coordinators. De novo cases of brain metastasis were defined as positive CT/MR within 30 days of initial cancer diagnosis and distinguished from relapsing cases (Stages I-IV at initial diagnosis). Cumulative incidence of relapsing brain metastasis was computed, stratified by cancer stage at initial diagnosis and adjusted for competing risk of death before developing brain metastasis. Survival difference between de novo and relapsing brain metastasis (those initially Stage I-III) was examined by a pre-specified proportional hazard regression model, adjusting for age and year of diagnosis.

Results: A total of 5,264 NSCLC incident cases diagnosed between 1999 and 2010 were identified and analyzed (90% have died). Median age at initial cancer diagnosis was 70 years. Proportion of Stage I, II, III and IV patients was 18%, 8.3%, 20% and 54% respectively. A total of 451 patients relapsed with brain metastasis, giving a five year cumulative incidence of 8.6%, 14% and 8.0% for Stage I-II, Stage III, and Stage IV, respectively. Among the 2,827 Stage IV patients, 631 (22%) and 179 (6.3%) had de novo and relapsing brain metastases, respectively. Median survival of de novo brain metastasis (n = 631, 3.2 months, CL 2.8-3.5 months) was worse than that for Stage I-III relapsing cases (n = 272, 3.9 months, CL 3.3-4.7 months), adjusted HR 1.24, CL 1.07-1.44 months.

Conclusions: The five-year cumulative incidence of brain metastasis was 8.6%, 13%, and 8.0% among Stage I-II, Stage III and Stage IV NSCLC patients. Twenty-two percent of Stage IV NSCLC patients presented with de novo brain metastasis, whose median survival was significantly worse than that for Stage I-III patients with relapsing brain metastasis.

164 RADIOTHERAPY FOR PALLIATION IN KAPOSI SARCOMA
Elizabeth Barnes, Emily Sinclair, Mary Doherty, Dalal Assaad, Oleh Antonyshyn, Jeffery Fialkov, Mary Tse
Odette Cancer Centre, Toronto, ON

Purpose: Kaposi sarcoma (KS) is a non-curable malignancy which can present with cutaneous lesions. Some patients with KS can have a long indolent chronic course. Radiotherapy is often used to help palliate local symptoms for cutaneous lesions which bleed or cause pain.

Methods and Materials: A retrospective review was undertaken for all KS patients treated with radiotherapy at our centre from January 2, 1999 to December 31, 2014 (inclusive). This study was approved by the local hospital Research Ethics Board. Demographic information (date of birth, gender, co-morbidities) were retrieved along with radiotherapy details, symptoms, treatment side-effects and outcomes.

Results: A total of 48 patients with KS (44 classical, 0 endemic, one iatrogenic, three AIDS related) were seen in our multidisciplinary skin clinic during this study period. Eighteen patients received radiotherapy to 107 sites (1-20 sites per patient). There were five females and 13 males. Ages at the time of initial radiotherapy ranged from 44-93 years of age. Radiotherapy dose ranged from 6 Gy in 1 fraction to 30 Gy in 10 fractions with the most common scheme being 8 Gy in 1 fraction or 20 Gy in 5 fractions. Of the 107 sites treated, 106 showed regression of the KS lesions with benefit in terms of pain, swelling or bleeding. One site in the posterior leg showed progressive KS despite 8 Gy in 1 fraction which continued to bleed and ulcerate. Two patients had initial partial response to radiotherapy but had relapse within the irradiated fields requiring repeat radiotherapy. One patient had relapse within the irradiated fields and subsequently was observed. No fatal toxicities occurred. The most common side effects were dry desquamation, hyperpigmentation and lymphedema of the legs.