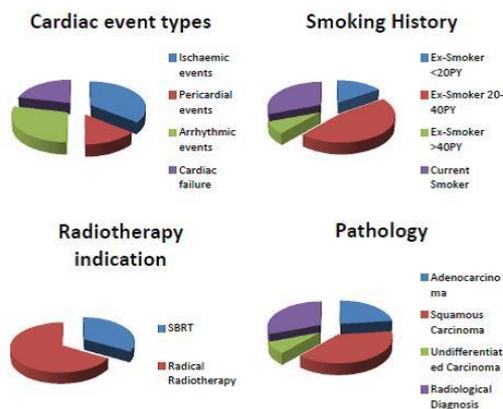


Table 1

Sex	Male	58(54%)
	Female	49(46%)
Age at RT treatment	Median =73	Range(45-90)
PS	0	6(5%)
	1	55(51%)
	2	43(40%)
	3	3(4%)
Smoking Status	Never smoked	2(2%)
	Ex-Smoker <10 PY	0(0%)
	Ex-smoker <20 PY	20(18%)
	Ex-Smoker 20-40PY	31(29%)
	Ex-Smoker >40 PY	17(16%)
	Current Smoker	37(35%)
Charlson Score	Median = 6 (2% estimated 10 year survival)	Range(3-10)
Qrisk3 Score	Median = 22.7% (%risk of stroke/MI in next 10 years)	Range(5.8-40.7)
Known pre-existing cardiac condition	= 32(30%)	Previous MI = 8 IHD = 12 Heart Failure = 1 Arrhythmia = 6 Valve defect = 2
RT indication	Adjuvant RT	10
	SBRT	48
	Concurrent ChemoRT	15
	Sequential ChemoRT	5
	Radical RT	26
	Radical RT for local recurrence	3
Pathology	Adeno	24
	Squam	29
	Adenosquam	0
	Undifferentiated NSCLC	4
	Small Cell	6
	Large Cell	3
	Radiological diagnosis	41

Charts 2

Patients who had cardiac toxicity following radiotherapy



Conclusion

A substantial proportion of patients had a cardiac event following radical radiotherapy for lung cancer. A large proportion of these patients had pre-existing cardiac conditions. Cardiac events occur much sooner after lung cancer radiotherapy than post-radiotherapy for breast cancer or lymphoma. Further work is on-going to expand

the patient numbers, examine risk factors and correlate cardiac events/survival with radiotherapy dosimetry.

PO-0772 Role of Prophylactic Cranial Irradiation in Extensive Disease Small Cell Lung Cancer

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Purpose or Objective

The role of prophylactic cranial irradiation (PCI) remains controversial in extensive disease small cell lung cancer (ED-SCLC). This study is performed to identify the risk factors of symptomatic brain metastasis and to evaluate the impact of PCI on brain metastasis-free survival (BMFS) and overall survival (OS) according to the risk of symptomatic brain metastasis in ED-SCLC.

Material and Methods

From 2006 to 2017, a total of 190 patients diagnosed with ED-SCLC who underwent FDG-PET and brain MRI prior to treatment were enrolled in this retrospective study. Among these patients, 53 (27.9%) received PCI and 137 (72.1%) did not. Prognostic index predicting a high risk of symptomatic brain metastasis was calculated in the observation group (137/190) on Cox regression model and the prognostic index was generated by summing significant factors weighted by hazard ratio of each. The role of PCI in each risk group was analyzed by using Kaplan-Meier survival analysis.

Results

Median follow-up time was 10.6 months. 1-year and 2-year symptomatic BMFS and OS were 86.9%, 52.5% and 49.8%, 12.7%, respectively. Multivariate Cox regression analysis showed that 4 risk factors were associated with high risk of symptomatic brain metastasis: presence of extrathoracic metastases ($P=0.005$), FDG-PET uptake in bone marrow (BM) or spleen ($P < 0.001$), progressive disease (PD) after chemotherapy ($P=0.010$), and high hemoglobin (Hb) level ($P=0.006$). The prognostic index significantly divided patients into two subgroups of high and low-risk of symptomatic brain metastasis ($P < 0.001$). PCI significantly improved BMFS in high-risk patients ($P=0.002$, 1-year rate 95.5% vs. 61.8%), but not in low-risk patients ($P=0.522$, 1-year rate 100.0% vs. 91.9%). However, PCI did not improve OS in patients at a high risk for symptomatic brain metastasis ($P=0.736$, 1-year rate 45.0% vs. 50.0%).

Conclusion

Four prognostic factors are associated with a high risk of symptomatic brain metastasis in ED-SCLC: presence of extrathoracic metastases, FDG-PET uptake in BM or spleen, PD after chemotherapy, and high Hb level. PCI is beneficial for patients at a high risk of symptomatic brain metastasis in terms of BMFS, but not OS. Therefore, selective use of PCI in ED-SCLC according to risk stratification is recommended.

PO-0773 CBCT is not valid for response evaluation after chemoradiotherapy for locally advanced NSCLC

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Purpose or Objective

The PACIFIC trial showed a remarkable overall survival benefit with the adjuvant immune checkpoint inhibitor durvalumab after concomitant chemoradiotherapy (cCRT) for stage III non-small cell lung cancer (NSCLC). Inclusion criteria in the study were performance status (PS) 0-1 and no progression after cCRT. The adjuvant therapy was initiated within 42 days after the last radiotherapy (RT) fraction. There was a statistically significant advantage of starting adjuvant treatment early versus late within the 42 days, emphasizing the value of early response evaluation. We examined if response evaluation based on cone beam CT scans (CBCT) can be used to select patients for adjuvant therapy after cCRT. Furthermore, we assessed the fraction of patients eligible for adjuvant treatment with immune checkpoint inhibitor.

Material and Methods

Patients with stage III NSCLC who received cCRT with cis- or carboplatin and vinorelbine in two prospective studies (2014-17) on deep inspiration breath-hold (DIBH) radiotherapy (RT) were included in the analysis. PS was prospectively registered at baseline and at completion of cCRT. CBCT response evaluation was performed retrospectively comparing the CBCT of the last fraction to the planning CT. Clinical response evaluation was done with contrast enhanced CT and compared to the planning CT. To avoid bias, CBCT evaluation was performed prior to assessing the CT evaluation. RECIST 1.1 criteria were used to evaluate if there was progression.

Results

Ninety-four patients were included in the two trials. After the planning FDG-PET/CT, 18 patients were upstaged and received palliative treatment, two patients were downstaged and had stereotactic body RT or resection, and one patient died. Seventy-three patients proceeded to cCRT. Two patients progressed during cCRT (both brain metastases) and four patients were lost to follow-up before the evaluation CT, leaving 67 patients (46% men / 54% women), for analysis.

Median age was 65 (range 49-85) years and median baseline PS was 1. Pathology was adenocarcinoma (58%), squamous carcinoma (36%) and others (4%). Fifty-one (76%) patients received RT in DIBH and 16 (24%) patients in free breathing.

CBCT response evaluation revealed local progression in one patient and CT response evaluation found progression in seven patients. Furthermore, two patients were diagnosed with brain metastases on MR between end of RT and CT evaluation. Table 1 summarizes the progressing patients. CT evaluation was performed at median 57 (range 0-123) days after end of treatment.

Seventeen (25%) patients were in PS0, 41 (61%) patients in PS1 and nine (13%) patients in PS 2 at end of RT.

Conclusion

CBCT cannot be recommended for treatment evaluation as most progressions (67%) were outside the CBCT field of view. Fifty (75%) patients were in PS 0-1 and without progression on CT evaluation after cCRT and thus candidates for adjuvant immune checkpoint inhibitor therapy.

Patient nr	Site of progression	Found on CBCT	Found on CT	Within CBCT FOV ¹	RT to CT time span ² (days)
7	Primary tumour	Yes	Yes	Yes	93
14	Brain	No	No	No	50
16	Pleura, lungs	No	Yes	No	64
23	Lymph nodes (groin)	No	Yes	No	95
27	Lungs, lymph nodes, bones, kidney	No	Yes	Yes (bones)	65
28	lymph nodes (retroperitoneal)	No	Yes	No	67
44	Brain	No	No	No	90
46	lymph nodes (mediastinal)	No	Yes	Yes	34
63	liver	No	Yes	No	48

¹ Field of view (FOV), ² Time from end of radiotherapy (RT) to CT acquisition

PO-0774 Outcomes of IMRT/VMAT vs 2D/3D-conformal thoracic radiation in limited stage small-cell lung cancer

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Purpose or Objective

To compare the efficacy and toxicity between IMRT/VMAT and 2D/3D-conformal radiation techniques in limited-stage small-cell lung cancer (LS-SCLC) patients treated with curative intent.

Material and Methods

A retrospective cohort of LS-SCLC patients treated with curative intent chemoradiation at the Princess Margaret Cancer Centre (1997-2018) were reviewed for patterns of efficacy/toxicity by radiation technique. Efficacy of different radiation techniques utilized overall survival (OS) from date of treatment initiation, censored at 10 years post-treatment start. The logrank test and Cox model were used to compare differences in survival by radiation technique. Toxicity rates (Grade ≥ 2 and ≥ 3 pneumonitis or esophagitis) were compared in a subset of patients (n=178) using logistic regression.

Results

Of 312 LS-SCLC patients, the median age was 66 years (range: 39-85 years); 56% were males. 150 patients received IMRT (n=146) or VMAT (n=4). 162 received other forms of radiotherapy (27 3D conformal and 135 opposed AP/PA). Median follow-up was 16.6 months for all patients and 22.2 months for all living patients. Median OS was 20.5 months (95% CI: 18.8-25.3 months). The unadjusted hazard ratio comparing IMRT/VMAT versus other radiation techniques was 1.11 (95% CI: 0.84-1.46; p=0.48) for OS. Of the 178 patients in the toxicity-analyzable subset, 53% experienced Grade ≥ 2 esophagitis (9% Grade ≥ 3) and 10% experienced Grade ≥ 2 radiation pneumonitis (5% Grade ≥ 3). The unadjusted odds ratios comparing IMRT/VMAT vs. other radiation techniques were 0.69 (95% CI: 0.35-1.34; p=0.27) for grade 2+ esophagitis and 0.69 (95% CI: 0.24-1.98; p=0.49) for grade 2+ pneumonitis.