was a significant predictor for OS (median, 55.6 vs 24.5 months, p=0.04). Low PLR (≤ 153.1) was associated with longer PFS (45.2 vs 9.8 months, p=0.009). Low NLR (≤ 2.97) showed a trend toward better OS (45.5 vs 24.5 months) and PFS (18.7 vs 10.4 months) with no statistical difference (*p*=0.19, 0.28).

Conclusion

Pretreatment PLR and LMR could be prognostic markers for OS and PFS in patients with non-small cell lung cancer treated with chemoradiotherapy.

EP-1403 Clinical outcome and toxicity of stereotactic ablative radiotherapy to centrally located tumors.

B. Atalar[1], B. Sahin[1], T. Zoto Mustafayev[1], G. Gungor[1], G. Aydin[1], B. Yapici[1], E. Ozyar[1]
[1]*Acibadem University, Department of Radiation Oncology, Istanbul, Turkey*

Purpose or Objective

Stereotactic ablative radiotherapy (SABR) has become an important part in management of centrally located lung tumors as well as lung metastasis. The aim of this study is to evaluate response rate, local recurrence-free survival (LRFS), overall survival (OS) and to identify toxicities and risk factors for their development related to SABR of central tumors.

Material and Methods

Seventy seven primary centrally located lung tumors or metastatic lung lesions were treated with linac based SABR. Median total dose and fraction size was 55Gy (range 30-60 Gy) and 8,8Gy (range 3,5-18Gy) respectively. All treatment plannes were within constraint limits of RTOG studies. Kaplan-Meier analysis was used to estimate LRFS and OS. Frequency of toxicities and their correlation to dosimetric parameters (mean lung dose, V5, V10, V20, mean esophagus dose, and maximum dose to heart, aorta, recurrent laryngeal nerve, trachea) and clinical data (previous history of radiotherapy to chest, age, gender) was recorded.

Results

Fifty five lung cancer patients (16 early stage, 26 recurrence, 13 oligometastatic) and 22 oligometastatic cancer patients (9 colorectal, 2 malignant melanoma, 2 laryngeal, 2 germ cell, 2 breast, 2 gastric, 3 other) were identified. Twenty three (29,9%) of patients had received previous radiotherapy to the chest. Complete response of the irradiated tumor was achieved in 37 patients (46,1%), partial response in 20 (26%), progression in 3 (3,9%) and in the rest of the patient response could not be determined. After a median follow-up of 16 months (1-83 months), 8 (10,3%) patients experienced local relapse and 45 (58,4%) patients had died, of these 34 of them were metastatic or recurrent tumors. Most of local recurrence occured during the first year after SABR and correlated with partial or no response. The 1-year and 5-year LRFS was 89,6% and 81,7%, 1-year and 5-year OS was 66,6% and 28,7%. Any toxicity was noted in 12 (15,6%) patients (17 events); 9 (11,7%) cases of radiation pneumonitis (RP), 5 (6,5%) esophagitis, 1 (1,3%) vocal cord paralysis, 1 (1,3%) Lhermitte's sign and 1 (1,3%) trachea perforation/pneumomediastenium. There were two cases of grade 5 toxicity. The most common complication RP correlated to V10 (p=0.038), marginally correlated to mean lung dose and V5 (p=0.055 and p=0.058) but did not correlate to V20, previous radiation to chest, age or gender. Esophagitis was correlated with previous radiation to the chest (p=0,009), but not with dosimetric parameters.

Conclusion

SABR has an emerging role in the treatment of primary and oligometastatic lung tumors. Our cohort confirmed its efficacy in local control with tolerable toxicity. However, more strict constraints and more carefull choice of patients is warranted.

EP-1404 Non-linear radiomic signatures characterizing overall survival from non-small cell lung cancer

M. Field[1], L. Holloway[2], S. Vinod[3], M.S. Barakat[1], V. Ahern[4], M. Bailey[5], M. Carolan[5], G. Delaney[3], A. Ghose[6], E. Hau[4], J. Lehmann[7], T. Lustberg[8], A.A. Miller[5], D. Stirling[6], J. Sykes[4], J. Van Soest[8], S. Walsh[8], A. Dekker[8], D.I. Thwaites[7]
[1]*University of New South Wales, Faculty of Medicine, Sydney, Australia*
[2]*Ingham Institute and Liverpool and Macarthur Cancer Therapy Centres, Medical Physics, Sydney, Australia*
[3]*Ingham Institute and Liverpool and Macarthur Cancer Therapy Centres, Radiation Oncology, Sydney, Australia*
[4]*Sydney West Radiation Oncology Network, Radiation Oncology, Sydney, Australia*
[5]*Illawarra Cancer Care Centre, Medical Physics, Wollongong, Australia*
[6]*University of Wollongong, Faculty of Engineering and Information Sciences, Wollongong, Australia*
[7]*University of Sydney, Institute of Medical Physics, Sydney, Australia*
[8]*MAASTRO Clinic, Department of Radiation Oncology, Maastricht, The Netherlands*

Purpose or Objective

The characterization of tumours from medical imaging using radiomic feature descriptors is an important tool for developing predictive models and maximizing the utility of current standard-of-care data. When developing a model, relevant features are selected or combined and as such the variations observed in tumours are assumed to reside in a latent subspace of the original features. We hypothesize that the SLLE method is superior to reduce the number of features to consider compared to PCA and univariate ranking of features by correlation.

Material and Methods

Two independent cohorts of patients were examined. The study population consisted of NSCLC patients who received curative radiotherapy (dose > 48Gy), had computed tomography (CT) scans with a tumour volume delineated and minimum two-year follow-up. A clinical practice data set of 268 patients from a local cancer therapy institution and a publicly available data set of 269 patients were combined into a data set [1]. The data were then randomly partitioned into training and testing data sets. A total of 612 radiomic features were calculated on each contoured tumour, including first order statistics, shape, texture and wavelet filtered features (using first-order statistics and texture). SLLE was computed to reduce the feature space before training a logistic regression model to predict two-year survival, with the parameters neighbourhood size and dimensions selected via cross-validation. This was compared to unsupervised principal component analysis (PCA) and a univariate ranking of correlation with outcome for each feature.

Results

The model constructed with SLLE and logistic regression had an AUC of 0.66 (95% CI: 0.58-0.73) on the test data set. A neighbourhood size of 10 and dimension of 6 was used in the classifier. In comparison selecting features with PCA resulted in AUC of 0.66 (95% CI: 0.58-0.71) for 7 dimensions and a model trained with the 8 highest ranking features by correlation with outcome had an AUC of 0.58 (95% CI: 0.51-0.67).

Conclusion

In this instance the non-linear transform (SLLE) and linear transform (PCA) were superior in predicting survival compared to independently ranking and selecting features that correlate with survival outcome. However, as SLLE and PCA performed equally, using outcome to guide the transformation in a supervised manner did not have an impact on the classification performance nor did the non-linearity captured by the LLE representation. There is scope for deriving new features or identifying feature transformations that uncover informative and