dation study with intraaortal catheter injection of ^{99m}Tc-labelled macroaggregates of albumin (MAA) was carried out in 12 patients. **Results**: Validation with ^{99m}Tc-MAA revealed significant correlation (r=0,89; p<0,002) between TBF values calculated from dynamic ^{99m}Tc-MIBI uptake data and from ^{99m}Tc-MAA reference method. TBF values observed in patients varied from 49,5 (sd 2,6) ml/min/100 g in malignant osteoblastoclastomas and 31.7 (sd 10,1) ml/min/100 g in osteogenic sarcomas down to 23,1 (sd 1,6) ml/min/100 g in reticulosarcomas, 17,4 (sd 7,2) ml/min/100 g in Ewing sarcomas, 14,3 (sd 2,1) ml/min/100 g in fibrosarcomas, 12,6 (sd 0,6) ml/min/100 g in chondrosarcomas. In 3 patients (Ewing's sarcoma, reticulosarcoma and haemangiopericytoma), in whom the chemotherapy was proven effective later on from analysis of bioptate we observed early (within three days) postchemotherapy drop of TBF for > 1/3 of initial value. In patients with no effect of chemotherapy there was no early decrease in TBF. **Conclusion**: Dynamic analysis of ^{99m}Tc-MIBI kinetics in sarcomas provides quantification of blood flow in absolute units. Early postchemotherapy decrease in tumour blood flow predicts the efficiency of chemotherapy in bone sarcomas.

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Applying radiomics and machine learning on PET images to predict lung metastases in soft tissue sarcoma patients

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Aim: Soft tissue sarcoma (STS) presents highly heterogeneous tumors, with metastases to lungs as main sites. The prognosis of lung metastases in STS patients is poor. The aim of this study was to investigate use of PET image radiomics and machine learning to predict lung metastases in STS patients. **Material and methods:** Fifty-one STS patients (33 without and 19 with developed lung metastases) from the Cancer Imaging Archive (TCIA) were subjected to this study. Gross tumor volume (GTV) delineation was done on T1-weighted MRI images registered to PET images. Subsequently, 100 3D quantitative radiomic features from different feature categories including shape, SUV and intensity histogram, gray level co-occurrence matrix (GLCM), neighborhood gray-tone difference matrix (NGTDM), gray-level size zone matrix (GLSZM), gray-level run-length matrix (GLRLM), normalized GLCM, neighboring gray level dependence (NGLD), texture feature coding (TFC), TFC GLCM and texture spectrum were extracted. Supervised machine learning methods (multinomial logistic regression, decision tree C4, multilayer perceptron (MLP), bagging, AdaBoost and Naive Bayes) were used to predict lung metastases from PET radiomic features. **Result:** The results of the constructed prediction models showed high overall classification performance. By using area under ROC curve (AUC) as an assessment index, multinomial logistic regression, Decision tree C4, multilayer perceptron (MLP), bagging, AdaBoost and Naive Bayes with 0.711, 0.777, 0.950, 0.811, 0.789 and 0.772, respectively, showed high prediction power, with MLP performing particularly favorably (0.950). **Conclusion:** Use of PET image radiomics features towards imaging biomarker discovery hold great promise for prediction of metastases to lung in STS patients. In our study, the best predictive model using PET radiomics was achieved by the MLP method. The proposed method can effectively predict lung metastases in STS by application of advanced machine learning to radiomic features.

EP-53 **during congress opening hours, e-Poster Area**

Clinical Oncology: Melanoma

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Voxel-based analysis of I-123 IMP in patients with uveal malignant melanoma: comparison with ROI analysis

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Purpose/Introduction Sometimes I-123 IMP is the only or the best tool to evaluate malignant melanoma. So it is thought very important to establish the objective quantification. Conventional ROI analysis sometimes miss the small or flat lesion, and sometimes impossible to draw reproducible ROIs. This time we assess the utility of voxel-based analysis for I-123 IMP SPECT/CT in uveal malignant melanoma, and compared with conventional ROI analysis. **Subjects & Methods** Fifty-two patients were examined. Thirty-one patients had malignant melanoma (group A), and 21 patients had either benign pigmented lesions or tumor except for malignant melanoma (group B). Early image was obtained 20 minutes after the intravenous injection of I-123 IMP, and delayed image was obtained after 24 hours. Early and delayed I-123 IMP SPECT/CT images were applied a two-dimensional ROI at the level of lesion (ROI analysis) and the three-dimensional region of interest (VOI) around the eye ball (VOI analysis). Both ROI and VOI were drown largestly inside the orbit. Retention index (RI=(delayed ratio- early ratio) / early ratio x 100) and tumor-to-nontumor ratio of the delayed phase (T/N) were calculated in each case by using ROI and VOI analysis. **Results** ROI analysis: RI and T/N were significantly higher in group A, relative to group B. In the ROI analysis, RI and T/N had cutoff value of 31.41 and 1.07, with AUC values of 0.916 and 0.932. VOI analysis: RI and T/N were significantly higher in group A, relative to group B. In the ROI analysis, RI and T/N had cutoff value of 6.13 and 1.14, with AUC values of 0.932 and 0.966. **Discussion/Conclusion** RI and T/N by VOI analysis was superior to ROI analysis in the differentiation of malignant melanoma from other lesions. Moreover VOI analysis had two advantages to the ROI