E1

PRIMARY SYSTEMATIC TREATMENT OF BREAST TUMOUR: LINKS BETWEEN DIAGNOSTIC EXAMINATIONS OBJECTIVE

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Background: The role of metabolic imaging is increasing in the measurement of early therapeutic response during cancer patient treatment. Our aim was to measure the effect of primary systemic chemotherapy (PST) on high risk breast cancer patients by using imaging modalities and pathology diagnostics and to find correlation between the applied modalities. The results of FDG-PET-CT examinations, which helped identify the extent of the tumour and the existence of distant metastases, were available for therapeutic decision, as well as the core biopsy results which showed the tumour’s biological behaviour. We compared the metabolic and morphological response, and analysed the relationship between these responses with the proliferation of the tumour, with special emphasis on changes in Ki-67 expression.

Material and methods: We report 22 (21 women and 1 man) of patients treated with PST during 2008–2010. All of them were examined by FDG-PET-CT for staging before chemotherapy and surgery. We excluded patients with distant metastases on pre-operative PET-CT, and those who refused surgery (lack of tissue samples). Standard Uptake Value (SUV) changes were measured on PET scans in the primary tumour and the axillary lymph node region. The calculated ΔSUVs were compared with morphological changes on native CT, as well as with the changes of the expression of Ki-67 proliferation marker measured by specific immune-histochemistry method in the core biopsy and surgical specimens. For analysing the changes we used two-sample T-test and Spearman rank correlation.

Results: The reduction of Ki-67 levels proved to be significant (49.41% vs. 16.23%, p = 0.001). A significant decrease was detected in the SUV of primary tumours (12.18 vs. 2.59, p = 0.001), and SUV of the axillary region (11.72 vs. 3.18 p = 0.009). A significant reduction was detected in the size of the primary tumour (30.86 mm vs. 17 mm, p = 0.002), but in the axillary lymph node region the reduction in size proved to be insignificant (18.58 mm vs. 14.58 mm, p = 0.319). Significant correlation was found between Ki-67 and SUV parameters before PST in primary tumours (p < 0.001). There was also a significant correlation between initial Ki-67 values and changes in SUV (p < 0.001), and between Ki-67 changes and in ΔSUVs (p < 0.001, correlation coefficient: +0.734).

Conclusions: Metabolic changes correlate well with the regression indicated by the proliferation marker, and with the pathological tumour response, better than the morphological regression, especially in axillary lymph node region. Beside the Ki-67 expression based on core biopsy, the FDG-PET-CT results may play an essential role in the indication of PST. PET-CT seems useful in the assessment of response to treatment, and it can be particularly significant in assessing the early therapeutic response of the tumours.

E2

COMPARISON OF FDG PET-CT AND MRI DWIBS TREATMENT FOLLOW UP EXAMINATIONS IN CHILDHOOD LYMPHOMAS

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Background: In the treatment follow up of childhood lymphomas FDG PET-CT is widely used as the most suitable method to assess the tumor viability. The MRI DWIBS (diffusion-weighted whole-body imaging with background body-signal suppression) is a new method without radiation, which is — based on the literature — also reliably determines the viability, but its sensitivity and specificity in childhood lymphomas are unknown yet. The aim of this study is the comparison of the two methods, and determination of the role of DWIBS in childhood lymphomas.

Material and methods: In our prospective study we have investigated 7 children with Hodgkin’s (HD) and 8 with non-Hodgkin’s (NHL) lymphomas. 26 pairs (12 HD and 14 NHL) of comparative PET-CT and MRI DWIBS examinations were performed. The average ages of the patients at the diagnosis were 13 years with HD and 9 years with NHL. Average time between MRI and PET-CT was 4.1 (0–19) days. The imaging results were compared clinical follow up and/or biopsy results. The data processing was based on medical records and on the reports of imaging procedures. In case of uncertain results we reevaluated the MRI and PET-CT images.

Results: In HD the results of the 12 MRI and PET-CT examinations correlated well in terms of morphology and viability. In 6/12 cases however, both examination methods showed lymph node regions with FDG-uptake or reduced diffusion without any proven viable tumor. All clinically positive tumors were confirmed by both imaging methods. In the NHL patient group, among the 14 PET-CT and MRI comparative examinations in 3/14 cases the relapse was clinically confirmed, but in 2 cases (which were two relapses of the same patient) MRI gave negative result. In 1/14 interim examinations MRI was positive, while PET-CT negative, but following additional treatments no viable tumor could be found. In case of 10/14 examinations, although the patients were in remission clinically, in only 4 cases could be supported this by both examinations. From the remaining 6 cases in 4 and 3 cases positivity was found by PET-CT and MRI respectively.

E3

18F-FDG PET/CT IN THERAPY RESPONSE ASSESSMENT OF BONE-DOMINANT BREAST CANCER

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Background: In patients with disseminated breast cancer malignant bone involvement occurs in approximatively 70%. Conventional imaging methods, including bone scintigraphy, are highly sensitive for detecting bone me-

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IMPORTANCE OF FDG PET-CT IN DIAGNOSIS AND FOLLOW-UP OF PATIENTS WITH BREAST CANCER

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Background: Our aim was to define extra information of FDG PET-CT examination comparing to the previous diagnostic images, to evaluate the percentage of confirmation of clinically supposed status and to define it's influence on oncologic treatment of patients.

Material and methods: The medical records of 143 consecutive patients with breast cancer referred from three oncologic centers from October 2008 to September 2009 were retrospectively reviewed. PET-CT imaging was performed with GE Discovery ST scanner according to the usual protocol. 143 patients (142 women, 1 man, mean age 56.9 years) have 155 breast tumors. The histologic subtypes of the primary tumors were infiltrating ductal carcinoma in 102, infiltrating lobular carcinoma in 18, DCIS alone in 9, other/unknown in 26 cases. Hystologically Grade 2 carcinoma occurred in largest proportion. 70 conservative operations and 74 mastectomies were performed. In remainder cases the operation was not performed or type of surgical procedure was not known.

Results: Definite diagnosis was established in 129 cases (84.3%), the extent of disease was increased in 40 (31%), diagnosis was unchanged in 24 cases (18.6%), it was negative in 65 cases (50%). The PET-CT result was equivocal in 24 cases (15.6%) having caused partly inadequate referral, partly difficulty of differentiation between tumor and inflammation. PET-CT examination gave excess information for physicians in 31%. The therapy was altered in 40 cases (26%) based on PET-CT result.

Conclusion: FDG PET-CT examination is useful in management of patients with breast cancer in case of adequate indication.

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FDG PET-CT IN MANTLE CELL LYMPHOMA

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Background: We assessed the potential role of PET-CT in the diagnostic workup of mantle cell lymphoma, which type of lymphoproliferative disease unites the unfavourable characteristics of aggressive and indolent lymphomas.

Material and methods: 122 PET-CT examinations of 56 patients were retrospectively analysed [11 pre-treatment, 17 interim, 20 restaging, 14 pre-, 23 post-Haemopoetic Stem Cell Transplantation (HSCT) evaluations, and 37 PET-CT examinations due to clinically suspected relapse].

Results: 9/11 staging examinations before initial therapy had revealed pathologic FDG accumulating focuses. Among the interim examinations (17) only 6 patients achieved complete metabolic remission (CMR), in 11 cases FDG-avid lesions were found. Among the 10/25 restaging PET-CT examinations indicating CMR, 4 patients relapsed within 1 year. Among the examinations showing CMR on the pre-transplantation PET-CT (9/14), relapse evolved in 1 case in the first year after transplantation. In 1 of 23 examinations CMR was not achieved after HSCT, from the 21 of 23 cases showing CMR on post-HSCT PET-CT, 2 patients relapsed within 1 year. In 1 of 23 post-transplantation examinations clinical signs of relapse did not develop after positive PET-CT. Clinical relapse suspicion was confirmed by PET-CT in 13 cases, in 5 of 37 cases it was found to be false positive, in the remaining patients relapse did not evolve after negative PET-CT (19/37).

Conclusion: FDG PET-CT seems to be an accurate method in the diagnostic workup of mantle cell lymphoma, including pre-treatment staging, interim,