precursor N-propagyl maleimide and [^{18}F]fluoro-PEG-azide. The decay-corrected yield of [^{18}F]fluoro-PEG-azide was 45% (n=10) and [^{18}F]FEMA was obtained in yields of 50% (n=10). Total synthesis time including HPLC purification was 80 min. Radiochemical purity was >99% with specific activity of 25.5 GBq/µmol (n=10) at the end of synthesis. [^{18}F]FEMA showed good stability in PBS and Saline. The fully automated synthesis of [^{18}F]FEMA was successfully accomplished in a high radiochemical yield. The optimized method using commercial synthesizer assures the routine production of [^{18}F]FEMA with the low-risk of radiation.

TP29

Checking the Proper Functioning of a Radiopharmacy Radiochromatograph

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OBJECTIVE: The aim of this project is to develop a procedure to verify the proper functioning of the radiochromatograph used for carrying out radiochemical purity control of radiopharmaceuticals. MATERIAL-METHODS: Prepare a strip of chromatography paper (1 x 10 cm), drawing exactly five dots: 1 cm (Rf 0.1), 3 cm (Rf 0.3), 5 cm (Rf 0.5) , 7 cm (Rf 0.7) and 9 cm (Rf 0.9), respectively. Take a syringe with 0.1 ml of concentrated radioactive solution of the desired radionuclide for verification. Place a drop of the that radioactive sample on the first point. Dilute the contents of the syringe to half with water and place another drop on the second point. Repeat the above process until the last point. Perform the strip's radiochromatogram. Cut the strip into five pieces of 2 cm each and measure their activities in an activity meter verified. Determine the correlation between the peak areas of radiochromatogram and its measures in the activimeter. Let the activity of the strip pieces to decay for a couple of days and make counts of the pieces with a well counter verified. Determine the correlation between the peak areas of radiochromatogram and its measures in the well counter. RESULTS: Obtaining a correlation coefficients, for the above measures, as close to 1 in absolute value and spatial coincidence of the peaks Rf of the radiochromatogram with the exact spots where the droplets were placed, provide the sufficient reliability for the radiochemical purity tests performed with this radiochromatograph. CONCLUSION: We conclude that this method can verify the proper functioning of our radiochromatograph and ensure that the quality control of radiochemical purity are performed correctly.

TP30

Dose reduction in whole body bone SPECT-CT

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Aim: Dose reduction in total body bone SPECT(-CT) without compromising in the diagnostic value of the exam. Method: Over a period of 5 months whole body SPECT(-CT) bonescans were acquired using the Philips BrightView XCT camera. Included in the study were the indications bone metastases and unexplained pain over the entire skeleton. After SPECT-acquisition a nuclear medicine physician determined whether a CT-scan would help in the diagnosis and of which part of the body this CT-scan should be made. Results: In this period 211 studies were acquired, in which 34 CT scans were performed. The mean age of the patients was 65 years (range 5-92 years). In 66 of the 177 SPECTs, no abnormal skeletal uptake was found. 13 of these patients went on for further examination, confirming these findings. From the 111 exams with visible abnormalities in the SPECT images, 56 patients went on to undergo different radiographic exams, in which the diagnosis was confirmed. 1 out of 34 CT scans included in this study remained inconclusive, even after further radiodiagnostic examination. Conclusion: This study shows that by first judging the SPECT images before acquiring the CT scan, the radiation dose can be reduced significantly, whilst maintaining the diagnostic value of the examination. In those patients that require a CT scan, less x-ray exposure is needed because the region of interest is known from the SPECT images.

TP31

The hybrid imaging techniques- SPECT-CT and PET-CT in the diagnostic algorithm in patients with somatostatin expressing tumors

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Somatostatin receptor scintigraphy is known to be highly sensitive for the diagnosis of somatostatin expressing (SR) neuroendocrine tumors, their regional and distant metastasis, in many cases performing superior to CT and MRI. The aim of our study was to share our experience in the application of the hybrid imaging techniques SPECT-CT and PET-CT in the diagnostic algorithm of patients with SR-expressing tumors for localization, staging and evaluation of the therapy. In total 55 examinations were performed on 50 patients (5 of them were examined twice-before and after 3-6 cycles of therapy), using the new somatostatin analog 99mTc-HYNIC-TOC (Tektrotyd,PL) at activity between 370-550 MBq. The average level of chromogranin was 234ng/ml and that of Ki 67-23%. Whole body and SPECT-CT scintigraphy were performed 2- 4h p.i. In 18/50 of the patients, in whom Ki 67 was above 2% and tumor localization and/ or stage still unclear after the examination, PET-CT (using 18F-FDG) was additionally applied within two weeks. The SR scintigraphy was true positive in 38/55 of the exams, true negative in 13/55 (after therapy), 2/55 false negative and 1/55 false positive, with a sensitivity of 95.0%, specificity-92.8% and accuracy-94.5%. PET-CT was positive in all investigated 18 patients with more aggressive behavior and helped for localizing of the primary tumor. All patients with positive results were referred for surgery or somatostatin therapy and/or chemotherapy depending on the stage and the differentiation of the disease. Our data showed that 99mTc-HYNIC-TOC was very promising, cheap, convenient and with comparable sensitivity to the other routinely available radiopharmaceuticals. In summary, we suggest that SR scintigraphy, using the new 99mTc-HYNIC-TOC and SPECT-CT technique, is very reliable in patients with SR expressing tumors. The therapeutic strategy could be optimized additionally applying 18F-FDG PET-CT in some of the patients.

TP32

Basic studies on measurement of ^{131}I activity using SPECT-CT

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Aim We evaluate visually hot spots of scintigrams (SPECT-CT + planar) for the diagnosis of metastases and relapses of thyroid cancer after ^{131}I therapy. However, they do not always provide accurate information for the diagnosis because the resolution and signal-noise ratio of scintigrams are not so good. The purpose of this study is to enhance accuracy of the diagnosis of metastases and relapses of thyroid cancer by analyzing the scintigrams quantitatively. Materials and Methods A solution of ^{131}I was enclosed into the pool, and cylindrical and spherical phantoms. Their SPECT-CT data were acquired and the radioactivity of the ^{131}I solution was measured by the well counter. The data acquired by SPECT/CT were reconstructed by 3D-OSEM and FBP, and attenuation and scattering corrections were made. Circular ROIs were drawn on the images and average counts per pixel were measured using Image J. When we used the pool phantom, cross calibration factor (CCF) was calculated as follows; CCF=W/P (P: the average counts per pixel [counts/pixel], W: the radioactivity of the ^{131}I solution measured by the well counter [cps/g]). The experiment was repeated once a week for 3 weeks. Then, using this equation, we calculated the radioactivity of ^{131}I solution with CCF and the average counts per pixel of the images when the cylindrical and spherical phantom was used, and compared them with the actually measured ^{131}I activity. Results In this study, we acquired almost the same CCF values in 3 experiments. And we found that the calculated ^{131}I activities decreased when the size of hot spots became smaller, although the same ^{131}I solution was enclosed into the phantoms. The size of the calculated radioactivities decreased almost three times more markedly than the full width half maximum acquired at the same condition. The main cause seems partial volume effects due to using a high-energy collimator. Conclusion The results of this study suggest that the size of hot spots may influence the calculated ^{131}I activity, and that an adequate correction for such a difference will be needed for the quantitative analysis of clinical images.