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PREOPERATIVE SCINTIGRAPHIC PARATHYROID GLAND LOCALISATION IN SECONDARY HYPERPARATHYROID PATIENTS TREATED WITH DIALYSIS

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Background: The most important pathology associated with chronic renal failure patients requiring dialysis is secondary hyperparathyreosis which sometimes need surgical treatment removing three and a half glands. The histological examination finds hyperplasia or adenoma in these hyperfunctioning glands. We aimed to locate the most normal parathyroid gland using parathyroid scintigraphy.

Material and methods: 36 patients with secondary hyperparathyreosis were examined before parathyroidectomy. 99m-Tc MIBI and per technetate subtraction was used. This method uses a reference ROI for proportional subtraction. Four ROIs were used as reference: thyroid tissue (thyroid gland without the parathyroid), whole thyroid gland and right and left lobes separately. We determined the mean counts per pixel in the regions of the parathyroid lobes and compared the results with the histological findings.

Results: The least active gland in a certain patient had a 3% probability to contain adenoma. Considering a gland positive if the mean count per pixel is above 10 the sensitivity, specificity, NPV and PPV are 77%, 100%, 77% and 100% respectively.

Conclusion: The 99m-Tc MIBI-per technetate subtraction parathyroid scintigraphy is a very reliable tool to choose the one parathyroid lobe which must be retained. The best reference ROI for the proportional subtraction method is the thyroid gland without the parathyroid glands.

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THE ROLE OF NUCLEAR MEDICINE IN THE DIAGNOSTICS OF DIABETIC FOOT

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Background: To present in basics literary facts and own experiences the role of nuclear medicine in the diagnostics of diabetic foot.

Material and methods: Scintigraphy with 99mTc-HMPAO labelled autolog leukocytes or immunoscintigraphy.

Results: It was made in 10 years period 41 leukocytescintigraphy and 47 immunoscintigraphy because of suspicion a musculoskeletal disease, out of these in 3 — 3 cases was the probably diagnosis diabetic foot.

Conclusion: In the authors opinion — on basic literary facts — it is needed more often nuclear methods to apply in the diagnostics of diabetic foot.

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EVALUATION OF PATIENT DOSES RELATED TO THE NUCLEAR MEDICINE INVESTIGATIONS IN THE PAST 20 YEARS IN HUNGARY

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Background: International reports dealing with the exposure of the population to radiation from medical sources describe a continuous increase during recent years due to the increase in the number of medical investigations (CT scans, interventional radiological examinations, unnecessarily repeated investigations, etc.). The radiation protection scientific committees are making great efforts to assess the patient doses, to follow up the cases, and, if possible, to decrease these doses. The aim of our study was to evaluate the patient doses in nuclear medicine in Hungary in representative years during the past two decades.

Material and methods: For the calculation of the effective doses, we used the mSv/MBq values from the ICRP 53. Publication; the data relating to the different types of nuclear medicine examinations were provided by the Hungarian College of Nuclear Medicine and the National Registry.

Results: During the analysed years 1991, 1997, 2004, 2005, 2007 and 2009; the total number of investigations was 155682, 177208, 173385, 187184, 156534, and 171846, respectively, while the collective effective doses (man Sv) were 471, 1025, 1010, 1016, 812 and 835, respectively. The total numbers of bone, lung, brain, kidney, thyroid (between 2004 and 2009), inflammation and tumour investigations exhibited good correlations ($R^2 = 0.9$) with the corresponding effective doses; for cardiology and gastroenterology, R^2 was 0.6; and for all different types of examinations combined, R^2 was 0.8.

Conclusions: during the past 20 years, the patient doses in nuclear medicine in Hungary have varied in proportion to the total number of investigations and did not display a continuous increase.

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THE IMPORTANCE OF RENOGRAPHY IN FOLLOWING OF RENAL TOXICITY CAUSED BY RADIOTHERAPY IN GASTRIC CANCER PATIENTS

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Background: Postoperative chemoradiotherapy in gastric cancer improves locoregional control and survival. Renal toxicity is one of the most serious complications in upper abdominal radiotherapy; we prospectively analyzed kidney function in patients, who underwent postoperative chemoradiotherapy for gastric cancer.

Material and methods: In 25 patients (age 39–81, average age: 61.4) renography was performed after the surgery, but before the postoperative chemoradiotherapy. In 20 patients the control renography was performed within 6–24 months, in 10 patients within 24–60 months after postoperative chemoradiotherapy. In 5 patients it was performed during both time intervals. The kidney in-damage to kidney in-safe (D/S) ratio was used as an index of the relative kidney function.

Results: for patients in the first group the D/S ratio decreased according to pre-radiotherapy investigation from 0.95 to 0.79 ($p < 0.05$). In the second group, where the control investigation were 24–60 month after the chemotherapy, the decline of D/S ratio was more significant, from 1.03 to 0.6 ($p < 0.01$).

Conclusion: The relative function impairment of the damaged kidney in patients after postoperative chemoradiotherapy for gastric cancer is demonstrated. In case of long survival, renography is recommended to monitor the state of the damaged kidney after years of radiotherapy.

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PET-CT APPEARANCE OF RELEVANT RADIOLOGICAL PULMONARY FINDINGS IN PATIENTS WITH LYMPHOMA

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Background: Pulmonary abnormalities are not uncommon on 18FDG PET-CT in patients diagnosed with lymphoma and may often cause differential diagnostic problems. These abnormalities may represent manifestation of lymphoma, inflammation, other pathology or might be clinically irrelevant. The aim of our retrospective study was the evaluation of relevant pulmonary findings with a follow-up period of 1–24 months.

Material and methods: The analysis involved 1085 PET-CT examinations of 721 lymphoma patients. Pulmonary nodules smaller than 5 mm and fibrotic

changes were regarded as radiologically irrelevant. A distinction was made between infiltrative and solid lesions based on their radiological appearance, and lesions were further characterised by their FDG-PET positivity. Differential diagnosis was made according to histology, clinical course of the disease, laboratory and microbiology results.

Results: Relevant radiological abnormalities were found in 116 patients (10.7%), of which 36 were diagnosed with Hodgkin (HL) and 80 with non-Hodgkin lymphoma (NHL). There were 45 infiltrative (8 FDG negative and 37 FDG positive) and 59 solid lesions (19 FDG negative and 40 FDG positive). Twelve patients were lost to follow-up. With regard to PET negative pathologies other than inflammation or lymphoma, there were 2 benign pulmonary nodules and interstitial lung disease was found in one case. Apart from the non-neoplastic cases, there were 2 primary lung tumours amongst the PET positive cases. The pulmonary manifestation of NHL was found to be solid PET-positive in all cases in our study, whereas infiltrative PET-positive finding was twice as common as the solid appearance in HL patients.

Conclusions: Our results draw attention to the different appearances of pulmonary manifestations of lymphoma, which can be very useful for the correct staging of the disease.

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INEFFECTIVENESS OF BONE PAIN PALLIATION THERAPY WITH RADIONUCLIDES

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Background: We experienced a growing number of ineffective bone pain palliation therapy with radionuclides in the last years. We examined the reasons of this in a retrospective study.

Material and methods: In the last 8 years 191 patient with multiple bone metastasis were treated with radionuclides for pain palliation. We split the group in two parts: the first group results (135 patients) were reported in a study in 2007. The second group (51 patients) were treated in the last 3 years. The patients age: 21–87, average: 57,3 years, man : 85 women: 101. Treated tumor types: breast 73 (47 + 21), prostate: 71 (52 + 19), other : 47 (36 + 11). The applied radiopharmaceuticals : Sm — 153 Multibone 161 (125 + 36), Y-90 Multibone 20 (8 + 12), Sm-153 Quadramet 6 (4 + 2) Sr-89 4 (3 + 1) with repeated therapies if needed. The patients were questioned in detail about the pain scale, blood results and about the applied other oncological therapies and about the alternative methods which were widespread used in the last years: special diets, vitamins, flavins, Avemar, Culevit, water types, mushrooms. We compared the data of the first group patients with the data of the second group.

Results: In case of breast tumors previously in the first group 95% of patients became painless, in the second group 76% of patients became pain free. In case of prostate cancer the first result was: 85%, the second result: 78%. In the first group we did not find patients with increasing pain but in the second group 4% of patients with breast tumor and 8% of the patients with prostate cancer reported increase of the bone pain after radionuclide therapy. Analyzing the patients with ineffective therapy we found the following results: out of 7 patients with breast tumor 5 had increasing pain, 2 were with constant pain, from the group of prostate cancer 4 had increasing pain, 2 were with constant pain. Out of 7 patient with breast tumor 2 rejected the chemotherapy, 3 rejected the bisphosphonate and hormone therapy. Out of patients with prostate cancer 2 rejected the hormone therapy and 4 the bisphosphonate therapy. 5 patients used only alternative therapy and 20% of patients used the alternative therapy in combination with the usual oncological protocols.

Conclusions: analyzing the results of the patients with bone palliation therapy with radionuclides we found an increasing number of ineffective pain palliation. According to our results the reason of this ineffective cases were that patients ignored the traditional oncological protocols and there were a widespread use of the alternative methods.