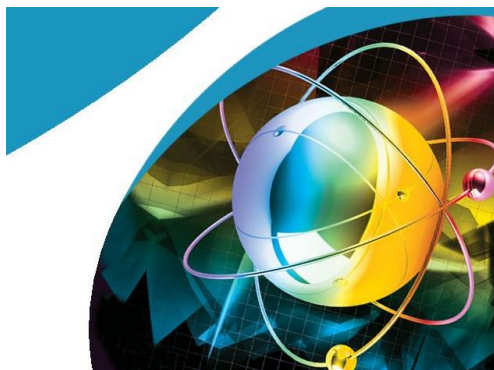




VOLUM DE REZUMATE

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ABSTRACT BOOK

NUCLEAR MEDICINE DAYS/ZILELE MEDICINEI NUCLEARE

**5TH NATIONAL CONFERENCE OF NUCLEAR MEDICINE /
A 5a CONFERINȚĂ NAȚIONALĂ DE MEDICINĂ NUCLEARĂ**

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Prof. Dr. Cipriana Ștefănescu

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PREZENTĂRI INVITATE

1. FROM STATIC TO DYNAMIC NUCLEAR IMAGING: HOW NOVEL TECHNOLOGIES AND RADIOPHARMACEUTICALS ARE CHANGING THE FIELD

Adriano Duatti

University of Ferrara and Legnaro National Laboratories (LNL-INFN), Italy

The imaging technologies currently in use for both SPECT and PET make hard to collect dynamic images during the course of a routine clinical study. The possibility of achieving a temporal follow-up of the accumulation and clearance of the radiopharmaceutical at the target site may disclose fundamental diagnostic information that are now average out because of the long acquisition time.

This scenario is doomed to change after the introduction of new, ultrafast SPECT and PET scanners that can shorten the acquisition time to less than one minute while attaining a spatial resolution below the one-millimeter scale. When these new tools will become widely available, a sharp improvement of the conventional nuclear imaging approach has to be expected, particularly if combined with a new generation of target-specific diagnostic agents characterized by pharmacokinetic properties suitable for ultrafast imaging. As an example, although in the past myocardial perfusion agents showing rapid washout were abandoned despite their superior kinetic properties such as linearity with blood flow, they may now become the most suitable markers of perfusion when employed in combination with ultrafast imaging. In this perspective, it is apparent that the sharp improvement brought about by the new high-speed, high-resolution imaging modalities will also determine a radical change of the conceptual design of radiopharmaceuticals for better matching the characteristics of the new instrumentation. Presumably, this will lead to rethink the diagnostic use of old radiopharmaceuticals and to give rise to a new generation of imaging agents.

In this lecture, an overview of the new imaging technologies will be briefly outlined and the question about how they could potentially impact the development of a more genuine approach to molecular imaging with novel classes of radiopharmaceuticals will be shortly discussed.

2. WORKING WITH PROTOCOLS IN NUCLEAR MEDICINE

G. Andries¹, A. Pavel², G. Crisan³

¹*Clinical County Emergency Hospital Cluj-Napoca*

²*Gamma Medical Cluj-Napoca*

³*Clinical County Emergency Hospital Cluj-Napoca*

Clinical imaging protocols play an important role in the provision of high-quality care in nuclear medicine. The development of protocols is intended to standardize technical factors, timing of imaging and the views obtained during imaging to provide the best information from which the scan may be reported. It is imperative that all nuclear medicine facilities have site specific protocols for every procedure performed.

A protocol is defined as a detailed plan for a medical experiment, treatment, or procedure. The goal of any protocol is to provide detailed structure for how to manage the patient and how to perform the procedure.

It is a challenge to write the best protocols, to make the most of the advantages and minimise the disadvantages. It rises a lot of questions: Why do we need protocols – legally and practically? Are they altogether a good thing? Do they change the need for staff training and experience? Who writes and who approves the protocols? What should be included in them?

When a procedure is performed in a standardized, reproducible manner, inter- and intra-operator variability is reduced, ensuring that each patient study is of optimal quality and every patient receives the same quality of service.

Protocols are also important for other reasons. They provide an outline for technologist training on performing procedures along with a mechanism to assess competency in performing procedures. A protocol provides a written record of the expected care to be provided to a patient. As long as the protocol adheres to best patient practices and complies with all federal, state, and local laws and regulations, it may provide a measure of protection in medical malpractice negligence claims.

Finally, protocols play an important role in accreditation, as the submission and evaluation of clinical protocols is an essential consideration in the accreditation process

3. OPTIMIZATION OF PREPARATION OF GA68 RADIOPHARMACEUTICALS: PRIVATE PRACTICE EXPERIENCE

Masha Maharaj

*Director, Department of Nuclear Medicine, Molecular Imaging and therapy centres of Excellence, Umhlanga
Netcare Hospital, Kwa-Zulu Natal, South Africa.*

The era of newer targeting tracers and radionuclides prompted a need for enhanced radiopharmaceuticals providing improved resolution, sensitivity and specificity. PET/CT hybrid modality resulted in the optimum “one-stop-shop” imaging technique for both localizing the metabolic and anatomical variations within a tumour. Gallium-68 a positron emitter radionuclide, has greatly impacted the nuclear medicine community, it is now widely used in positron emission tomography (PET) diagnosis of various malignancies especially in neuroendocrine tumors (NETs) and prostate cancer. We will discuss the optimization of preparation of Ga68 radiopharmaceuticals with reference to our centre experience.

4. ADVANCES IN MOLECULAR IMAGING

Simona Ben Haim

Israel

Molecular Imaging is the visualization, characterization and measurement of biological processes at the molecular and cellular levels in humans and other living systems and typically includes two- or three-dimensional imaging as well as quantification over time. The talk will include an overview of some of the recent developments in the field of Molecular Imaging and a discussion how these developments are driving and will drive in future towards personalized medicine and precision medicine, mainly in the field of Oncology.

5. QUANTITATIVE MYOCARDIAL BLOOD FLOW MEASUREMENTS WITH EMPHASIS ON SPECT

Simona Ben Haim

Israel

Myocardial blood flow (MBF) and myocardial flow reserve (MFR) are important physiologic parameters for the detection of hemodynamically significant coronary artery disease (CAD) and have been shown to improve diagnostic accuracy and risk stratification of myocardial perfusion imaging (MPI) beyond that provided by relative perfusion abnormalities alone. Quantitative assessment of MBF can be obtained from cardiac PET, well validated and reproducible. However, PET is infrequently used in clinical practice due to the limited availability of PET scanners, suitable radiotracers and dedicated software as compared to the widely used SPECT. MPI SPECT with conventional Anger technology has been traditionally limited to visual analysis or semi-quantitative perfusion analysis. SPECT quantification of MBF requires fast acquisition of dynamic data in 5-10 sec, as well as corrections, mainly for attenuation and scatter, which enable absolute measurement as well as a suitable radiotracer. Conventional SPECT can be used for quantitation with the microsphere method; however, results are not as accurate as PET. Dynamic SPECT images can be obtained with a rapidly rotating conventional SPECT camera, but the development of non-rotating cardiac systems has made this simpler. Studies are showing good correlation with microspheres in a porcine model, and in human's good correlations with coronary angiography, as well as ^{13}N -ammonia and ^{15}O -H $_2\text{O}$. More studies are ongoing to assess the incremental diagnostic and prognostic value of SPECT MBF and MFR measurements.

6. NUCLEAR MEDICINE IN TRANSTHYRETIN AMYLOIDOSIS - PERSONAL EXPERIENCE

Stan C. A.¹, Chirion C.¹, Stanescu D. A.¹, Badelita S.², Jurcut R.³, Beladan C.³

¹Fundeni Clinical Institute, Dept. of Nuclear Medicine,

²Fundeni Clinical Institute, Dept. of Hematology

³"Prof.dr.C.C.Iliescu" Cardiovascular Institute

Background of the study. Amyloidosis is a heterogeneous group of diseases caused by extracellular deposition of insoluble fibrils. Amyloid depositions can occur in multiple organs (heart, liver, kidney, skin, eyes, lungs, nervous system) resulting in a variety of clinical manifestations. Several types of amyloid can infiltrate the heart resulting in a restrictive cardiomyopathy, heart failure, and atrial and ventricular arrhythmias. The most clinically relevant cardiac involvement occurs in primary light-chain (AL) amyloidosis, familial transthyretin amyloidosis (mutant transthyretin, ATTRm), and senile transthyretin amyloidosis (wild-type transthyretin, ATTRwt). Endomyocardial biopsy (EMB) is the gold standard for diagnosis of cardiac amyloid, but is performed only in specialized centers. Instead of highly sensitive, EMB does not provide sufficient information about extent and progression of disease, prognostic information, nor response to treatment. The purpose of the study was to evaluate bone seeking tracer (99mTechnetium - hydroxydiphosphonate, 99mTc-HDP) scintigraphy (BSTS) for the detection of cardiac amyloidosis.

Methodology. Ten subjects (5 female/5 male) between 47- 83 years, underwent 99mTc-HDP cardiac planar or whole body imaging and single photon emission computed tomography (SPECT) for detection of cardiac involvement of suspected or confirmed systemic amyloidosis.

We correlated cardiac nuclear imaging with: cardiac ultrasound, ECG, neurological exam and EMG (electromyography), FNA (fine needle aspiration) for abdominal fat pad with Congo red staining and bone marrow or renal biopsy. We calculated sensitivity (Se), specificity (Sp), positive and negative predictive values (PPV, NPV). Cardiac retention was assessed with both a semi quantitative visual score (VS) (0 = no uptake, 1 = mild uptake, 2 = moderate uptake, 3 = strong uptake) and by quantitative analysis by drawing a region of interest over the heart corrected for contralateral counts and calculating a heart-to-contralateral ratio (H/CL).

Results. We found: Se 100%, Sp 100%, PPV 100% and NPV 100% for detection of ATTR with cardiac involvement. Five of them (50%) were confirmed by biopsy for ATTRm and were positive for cardiac amyloid deposition, on scintigraphy. One of the patients (10%) (83y.) had a negative biopsy for ATTRm or AL, but a positive scintigraphy test is suggestive for a senile amyloidosis (ATTRwt). Three patients (30%) with negative biopsy for ATTR were also negative on scintigraphy. Another patient (10%) with AL (62y.) and suspected cardiac involvement was negative at scintigraphy. We obtained a cardiac retention assessed by VS=2 at 4 patients and VS=1 in 2 cases. H/CL score varied from 1.68 to 2.7. From 12 patients send in Nuclear Medicine Department, from Jan to May 2019 with suspicion of systemic amyloidosis, two of them (16.67%) were positive for ATTR, one for ATTRwt, the other for ATTRm.

Conclusion. EMB remains the gold standard for detection of cardiac amyloidosis. However, EMBs, does not provide sufficient information about extent and progression of disease, prognostic information, nor response to treatment. Scintigraphy with bone seeking radiotracer is a noninvasive method that may facilitate early diagnosis, distinguish various forms of cardiac amyloid and may be useful in following disease burden.

7. BIOMARKERS IN THYROID TUMORS

Iulia Andreea Chiriac, A.L. Goldstein

*Compartimentul Endocrinologie - Terapie Izotopică, Institutul Național de Endocrinologie "C.I. Parhon",
București*

Obiective: Să prezentăm o descriere generală a biomarkerilor tumorilor tiroidiene, utilizarea și limitările lor în practica clinică curentă pentru un diagnostic și o utilizare adecvată.

Metode: Folosind probe tisulare și de sânge, markerii biologici pot fi separați și măsurați obiectiv la nivel celular, biochimic sau molecular, pentru a identifica statusul fiziologic sau patofiziologic, sau pentru a evalua răspunsul terapeutic al cancerelor tiroidiene diferențiate din epiteliu folicular, medulare și agresive.

Rezultate: Biomarkerii standard în cancerle tiroidiene sunt furnizați de examinarea imunohistochimică, pe lângă aceștia biomarkerii proteici specifici, ca de exemplu tiroglobulina și calcitonina, sunt utilizați pentru detectarea și monitorizarea bolii neoplazice. Soluții noi, cum ar fi conceptul de "biopsie lichidă", celulele tumorale circulante, modificări genetice și

microARN, ajută la identificarea sau orintarea patologiei; acestea sunt studiate și pot fi utilizate ca teste-biomarker pentru cancerle tiroidiene.

Concluzii: Necesitatea de a găsi markeri biologici cu specificitate și sensibilitate înalte a implicat diferite discipline precum endocrinologia, medicina de laborator, medicina nucleară, anatomia patologică și oncologia în abordarea multidisciplinară a tumorilor tiroidiene.

Cuvinte cheie: biomarkeri, “biopsie lichidă”, celulele tumorale circulante, modificări genetice, microARN

BIOMARKERS IN THYROID TUMORS

Iulia Andreea Chiriac¹, A.L. Goldstein¹

*Endocrinology and Isotopic Therapy Department, National Institute of Endocrinology “C.I. Parhon”,
Bucharest*

Objective: To present a general review of the thyroid tumor biomarkers, to describe their current usage and limitations in clinical practice for the proper diagnosis and management.

Methods: Using tissue and blood samples, biological markers can be separated and be objectively measured at a cellular, biochemical or molecular level in order to identify the physiological or pathophysiological status, or to evaluate the therapeutic response of differentiated, medullary and aggressive thyroid cancers.

Results: The standard biomarkers in thyroid cancer are provided by the histological examination, besides these serum disease-specific protein biomarkers, as per example thyroglobulin and calcitonin, are used to detect and monitor the illness. Novel solutions, as the “liquid biopsy” concept, circulating tumor cells, gene transcripts and microRNA, which help identifying the disease status, are being studied and can be used as cancer biomarker assays.

Conclusions: The need to find biomarkers with high-level accuracy has involved different disciplines like endocrinology, laboratory medicine, nuclear medicine, pathology, and oncology in the multidisciplinary approach of thyroid tumors.

Key words: biomarkers, “liquid biopsy”, circulating tumor cells, gene transcripts, microRNA

8. CONTROVERSIES, CONSENSUS AND COLLABORATION IN THE USE OF I-131 THERAPY IN DIFFERENTIATED THYROID CANCER “THE MARTINIQUE PRINCIPLES”

G. Kermoison, L. Hîțu, G. Rusu, H. Haba, A. Alexiev, E. Spinu, K. Gabora, E. Olariu, A. Piciu, D. Piciu;
“Prof. Dr. Ion Chiricuta” Institute of Oncology, Cluj-Napoca, Romania.

Introduction. Publication of the 2015 American Thyroid Association (ATA) management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer was met with disagreement by the extended nuclear medicine community related to the diagnostic and therapeutic utilization of radioiodine (I-131). European Association of Nuclear Medicine (EANM) and Society of Nuclear Medicine and Molecular Imaging (SNMMI) declined to support the guidelines, considering this ATA, EANM, SNMMI, and the European thyroid association (ETA) worked together to define the format and scope of a meeting in Martinique. After 2 days (13-14 January 2018) of consideration, debate, and collegial exchange of concepts, the conference participants agreed on a set of nine principles: The Martinique principles.

Meeting report:

- Principle 1: Advancing our understanding of optimal thyroid cancer management requires a commitment by clinicians, researchers, patients and organizations to engage in proactive, purposeful, and inclusive inter-disciplinary cooperation.
- Principle 2: The goal of I-131 therapy should be characterized as remnant ablation, adjuvant treatment, or treatment of known disease using standardized definitions.
- Principle 3: Evaluation of post-operative disease status is required to optimize proper patient selection for I-131 therapy (remnant ablation, adjuvant treatment, or treatment of known disease).

- Principle 4: Post-operative disease status evaluations should be standardized and integrated into routine clinical care.
- Principle 5: Optimal patient selection for I-131 adjuvant treatment requires consideration and evaluation of multiple factors beyond post-operative disease status and risk stratification.
- Principle 6: The optimal administered I-131 activity for adjuvant treatment cannot be definitely determined from published literature. Evaluation of the role of adjuvant treatment by a review of the literature is difficult as most studies have examined relatively small cohorts followed for suboptimal time periods.
- Principle 7: Characteristics used to classify patients as I-131 refractory should be used to risk stratify patients with regard to the likelihood that a tumor will respond to I-131 therapy and not necessarily as definitive criteria to mandate whether or not I-131 therapy should be recommended. Common clinical scenarios that suggest a patient may have I-131 refractory thyroid cancer: 1) No radioiodine uptake is present on a diagnostic radioiodine scan 2) No radioiodine uptake is present on a radioiodine scan performed several days after I-131 therapy 3) Radioiodine uptake is only present in some but not other tumor foci 4) DTC metastasis(es) progress despite radioiodine uptake 5) DTC metastasis(es) progress despite a cumulative I-131 activity of >22.2 Gbq(600mCi).
- Principle 8: I-131 refractory criteria will continue to evolve as a) additional studies address important limitations and technical issues confounding the current literature, b) techniques for radioiodine imaging are optimized and standardized, and c) redifferentiation therapies who improve the efficacy of I-131 therapy.
- Principle 9: Major gaps in knowledge and evidence regarding optimal use of I-131 therapy should be addressed with properly designed prospective studies.

Conclusion: The Martinique meeting restored trust, confidence and a sense of collegiality between individuals and organizations that are committed to optimal management for patients with thyroid disease.

9. MANAGEMENT OF I¹³¹ REFRACTORY THYROID CANCER: A MULTIMODALITY APPROACH

Partha S Choudhury.

Rajiv Gandhi Cancer Institute & Research Centre, Delhi, India

Differentiated Thyroid Cancer (DTC) is best treated with the use of initial thyroidectomy followed by radio-iodine therapy (RAI). In a metastatic setting RAI can also be effectively used for treatment when the sodium iodide symporter (NIS) is intact leading to cure in a significant number of patients. NIS is found to be expressed more in differentiated thyroid cancer tissue and is usually negative in poorly differentiated tissues like in oxyphilic change and anaplastic transformation. GLUT -1 expression was more observed in NIS negative cases and vice versa leading to the concept of personalized treatment by the theranostic approach. NIS expression may also be helpful in predicting response and enhance patient management. The aggressive variety of thyroid cancers generally over express other receptors like GLUT, GLUT1, hexokinase 1 or HIF-1^α with or without NIS. RAI refractory DTC is best imaged by Positron Emission Tomography-Computed Tomography (PET-CT) either with ¹⁸F FDG or more recently with ⁶⁸Ga labelled DOTA compounds. RAI refractory DTC needs a multimodality approach of treatment depending on the site and volume of disease or whether there are NIS expression at some sites or such expression is totally absent. Therefore the treatment can be local or systemic or a combination of both. Many genetic alterations have been seen in the molecular pathogenesis of DTC, most commonly RET/PTC translocations and BRAFV600E point mutations in PTC and RAS point mutations in FTC & poorly DTC. Elevated expression of vascular endothelial growth factor (VEGF) and its receptors (VEGFR) may play a role in thyroid carcinoma. Studies of the tumor biology of DTC has led to the development of targeted therapies based on the theranostic concepts. Currently based on the findings of multicentre, randomized, double blind placebo-controlled phase III studies, two agents, Sorafenib and Lenvatinib has been approved in US and Europe for the treatment of this group of thyroid cancer. The DECISION & SELECT trials showed that Sorafenib & Lenvatinib has significant benefit in terms of progression free survival over placebo. Patients of RAI refractory disease a negative RAI scan and a positive FDG PET-CT scan are the candidates for this treatment and FDG PET can also be used for objective response evaluation by PERCIST. So far these drugs have shown promising results in terms of disease control, regression or stable disease. It must be however remembered that these agents are associated with side effects most commonly being hand / foot skin reactions, rash, fatigue, mucositis, hypertension diarrhoea, ECG changes and weight loss. The severity of the symptoms of side effects and the potential benefit needs to be critically evaluated before starting this form of treatment

PTC with BRAF mutations are associated with significantly reduced expression of genes involved in the metabolism of iodine, including genes for NIS, Tg & thyroperoxidase (TPO). On the other hand, BRAF mutated tumors exhibit higher GLUT-1 receptors levels. These play an important part in the tumor dedifferentiation reducing efficacy of RAI. Another

treatment option which has been recently proposed for RAI refractory thyroid cancer is peptide receptor radionuclide therapy (PRRT) based on the theranostic concept. PRRT is a unique way of targeting somatostatin receptors over expression on tumor cells in many cancers including thyroid. At this point of time and with the available literature PRRT shows variable results in the form of partial remission or stable disease in approx. 50% of the treated patients. However, the currently available results cannot be treated as sufficient evidence for recommending this form of treatment in iodine refractory DTC. Further long-term studies will be needed before PRRT can be established as an option in the treatment of RAI refractory metastatic DTC. In this presentation the investigational and therapeutic approach in a patient of RAI refractory DTC will be discussed.

10.CZT IMAGING AND TECHNOLOGY

Alex Frenkel
Israel

A new integrated cadmium zinc telluride (CZT) nuclear-imaging detector has been designed to enable a new generation of high-resolution, low-dose nuclear-medicine cameras.

Those detectors uses direct transfer of energy and location information that results in better energy and spatial resolution than conventional SPECT.

From organ dedicated imaging, the CZT technology, evolved in general purpose whole body cameras with much better performance than the conventional NaI(Tl) camera.

These cameras provide better spatial resolution and superior patient positioning options. Better energy resolution accommodates dual isotope scans and scatter rejection giving better contrast.

Increasing sensitivity of the CZT camera allowed reducing the dose injected or the time of the study.

This issue is well demonstrated in the clinical studies.

11.THE ROLE OF CHOLINE PETCT IN PROSTATE CANCER. REVIEW OF BIBLIOGRAPHY

Mariela Golti
Argentina

Choline PET/CT imaging has been proposed for the detection of primary intraprostatic cancer (PC) , for staging of the disease, and for detection of tumour recurrence in patients with biochemical relapse. Regards the detection of primary PC patients with high PSA values and repetitive negative biopsies , In 25% of patients, 18F-choline PET/CT allowed the identification of neoplastic prostatic zones, however the main article regards this , considered focal uptake and there was no important difference in SUV between hyperplasia and carcinoma, there are other articles that says it is useful although with low specificity. In my country we only have 18 FCH PET/CT and most articles refer to 11CHOLINE , so it is important to set up that there is solid evidence regards both protocols performed equally for early recurrent PC staging show an overall excellent concordance on a perpatient and a per-lesion basis(1) Considering initial diagnosis, there is clear evidence that prostate cancer was identified in all the patients on PET/CT. Local disease was seen in 62%; loco-regional node involvement in 21% and metastatic disease in 17 % . PET/CT confirmed the therapeutic decision in 48.6% of cases and led to a therapeutic modification in 43.2% of cases, avoiding radical prostatectomy and lymphadenectomy in 25% of cases or modifying the extend of radiotherapy (25%) .(3) FCH-PET/CT offers more clinical utility as a first-line imaging modality than CT scan and whole-body bone scan.(4) The efficiency of FCH PET/CT in detecting both bone and lymph-node involvement of, Prostate cancer, at initial staging was found to be higher than that of conventional imaging.(2)specially in high risk patients , considering high risk(15% of the PC) when initial PSA is > than 20 or Gleason is more or equal to 8 (AUA ,American Urological Association) or initial stadification is T3 a Regards biochemical relapse , PSA absolute value, defined as a PSA >0.2 ng/ml after radical prostatectomy and as a PSA of 2 ng/ml above the nadir after RT, it is very important to distinguish between the presence of a single lesion and multiple lesions and to correctly detect the site(s) of relapse in order to establish the proper therapy. PSA kinetic parameters (PSA duplicating time and PSA velocity's change) express the change in PSA levels over time. Many studies showed that PSA level and a short PSAdt were the only significant predictors of positive a 11C-choline PET/CT scan. PSAdt values differ depending on the site of recurrence: in those with a shorter PSAdt, the presence of a distant metastasis is more probable, while in those with a longer PSAdt the presence of local relapse should be suspected first. Routine use of choline PET/CT has been recommended for those with a PSA level >1 ng/ml [23]. PET/CT

with either 11C-choline or 18F-choline has shown a significantly higher detection rate of lymph- node or distant metastasis than other imaging modalities (6) The value of 18F-Choline PET/CT in patients with elevated PSA-level and negative prostate needle biopsy for localisation of prostate cancer. <https://link.springer.com/journal/259> (2)Scand J Urol. 2015;49(5):345-53. doi: 10.3109/21681805.2015.1005665. Epub 2015 Feb 3. Comparison between conventional imaging (abdominal-pelvic computed tomography and bone scan) and [(18)F] choline positron emission tomography/computed tomography imaging for the initial staging of patients with intermediate- to high-risk prostate cancer: A retrospective analysis. (1) First imaging results of an intraindividual comparison of 11C-acetate and 18Ffluorocholine PET/CT in patients with prostate cancer at early biochemical first or second relapse after prostatectomy or radiotherapy Franz Buchegger & Valentina Garibotto & Thomas Zilli & Laurent Allainmat & Sandra Jorcano & Hansjörg Vees & Olivier Rager & Charles Steiner & Habib Zaidi & Yann Seimille & Osman Ratib & Raymond Mirabell .Eur J Nucl Med Mol Imaging (2014) 41:68– 78 (6) 11C-Choline PET/CT and PSA kinetics Paolo Castellucci & Maria Picchio Eur J Nucl Med Mol Imaging (2013) 40 (Suppl 1):S36–S40 (3) Impact of the 18F- PET/CT scan in the management of patients with high-risk or intermediate-risk prostate cancer at initial diagnosis or at recurrence. Gilles Pasticier, Marine Chicart, Marine Gross-Goupil , Laurence Donon , Gregoire Robert , Jean-Marie Ferriere... (4) ASCO GU 2019: A Randomized Trial Comparing Fluorocholine-PET/CT with Conventional Imaging in Prostate Cancer. Presented by: Scott Williams, MD, Peter MacCallum Cancer Centre, Melbourne, Australia Written by: Hanan Goldberg, MD, Urologic Oncology Fellow (SUO), University of Toronto, Princess Margaret Cancer Centre

12.LU-PSMA PRIVATE PRACTICE CLINICAL EXPERIENCE: THE WINS AND WOES

Masha Maharaj

Director, Department of Nuclear Medicine, Molecular Imaging and therapy centres of Excellence, Umhlanga Netcare Hospital, Kwa-Zulu Natal, South Africa.

In 1853 Surgeon J. Adams described and reported the first case of prostate cancer as “a very rare disease”. Fastrack 164 years later according to NCR 2013 (in South Africa) men have a lifetime risk of 1 in 18 (with a climbing rate as diagnosis improves and the population average age increases). The tumour is biologically and clinically heterogeneous making imaging evaluation and therapy challenging. The Cell surface protein Prostate specific membrane antigen -PSMA is significantly expressed in prostate cancer. This has provided a novel primary target for prostate carcinoma imaging and therapy. The principle of “if you can see it, you can treat it” remains true. We will be discussing Lutetium- PSMA, current literature and its applications in Prostate cancer therapy with reference to our centre experience.

13.PSMA PRLT – AUGMENTED AND INDIVIDUALIZED TREATMENT (PRLT 2.0)

Same Ezziddin

Germany

Understanding the mechanism and specific issues of PSMA-targeted PRLT, as well as potential risk factors for unfavorable course of disease under therapy, is helpful to escalate PRLT when needed. Indications for PRLT and arguments for earlier application will be covered, as well as contraindications and pseudo-contraindications.^[1] Augmentation methods for PRLT including comedication and potential maintenance therapy in PRLT responders are matters of clinical concern. Also, the toxicity profile of Lu177 and Ac225 based PSMA-targeted PRLT, covering the subject of tandem vs single isotope approach.

Keywords: Peptide radioligand therapy, Tandem targeted treatment, PSMA Therapy

14.FDG PET/CT IN COLORECTAL MALIGNANT DISEASES. PRACTICAL ISSUES IN OUR CLINICAL EXPERIENCE.

Dragos Cuzino, Magda Iriciuc, Raluca Mititelu, Mirela Oancea, Carmen Tipar, Catalin Mazilu
Central Emergency University Military Hospital Bucharest Romania

Purpose: We analyze the efficiency of PET/CT in staging, restaging and therapy response assessment of colorectal oncology patients. FDG PET/CT has several applications in colorectal cancer (CRC) imaging including preoperative evaluation of apparently limited metastatic disease, detection of disease recurrence, clarification of equivocal lesions at initial staging, investigation of unexplained rising tumour markers, and incidental detection of occult primary colonic tumours. With the use of illustrative clinical examples, our study reviews the utility of FDG PET/CT in the management of CRC, discussing its role and limitations in the multimodality imaging of these patients. A variable number of patients with colorectal cancer (CRC) are likely to have a symptomatic or asymptomatic recurrence within the first 1-2 years. Conventional imaging modalities have limitations in detecting recurrent disease early. The purpose of our study was to assess the usefulness of fluorodeoxyglucose-positron emission tomography/computed tomography (FDG-PET/CT) in the detection of recurrence in patients with CRC.

Discussions: PET/CT was found to have limitations in detecting microscopic disease and small-sized lesions. The common cause of false-positive PET/CT results was infective and inflammatory pathology in our setup.

Material and methods: PET/CT showed high sensitivity, specificity, and accuracy for the detection of recurrent disease in patients, who were earlier treated for CRC. PET/CT can be considered as a useful diagnostic tool in these patients. PET/CT has become one of the most used imaging modalities to stage, follow-up and re-stage patients with colorectal cancer and liver metastases. All patients underwent whole-body contrast-enhanced 18F-FDG PET/CT and the imaging diagnosis was compared with pathological diagnosis and other complementary diagnostic imaging methods.

Conclusions and findings: For PET/CT images the standard uptake value (SUV) was calculated on primary tumor and regional lymph nodes as well as on contiguous tissues appeared to be involved. T and N PET/CT staging was compared to histopathologic findings. PET/CT images are diagnostic imaging tools in identifying primary tumor extent and lymph node and metastases and peritoneal nodular extension despite or with loc-regional assessment of the peritoneal disease.

15. RADIOPROTECTIA IN CAZUL UNUI INCIDENT CU SUBSTANTE RADIOACTIVE

Fizician medical Maria-Alina Gherman
Spitalul Universitar de Urgență Militar Central "Dr. Carol Davila"

Descoperirea radioactivității a adus omenirii atât beneficii, cât și dezastre, unele din ele întamplându-se deja la scară mai mică sau mai mare. Oamenii pot fi contaminați radioactiv intern sau extern cu unul sau mai mulți radionuclizi. Ca urmare a contaminării, consecințele clinice pot varia de la sindromul radiatiei acute la dezvoltarea cancerului în timp. Radioprotecția în cazul în care oamenii au fost deja contaminați depinde foarte mult de persoanele care descoperă incidentul, de personalul medical care acționează pentru a elimina și micșora cât mai mult doza încasată, de estimarea cantității de material radioactiv absorbit de organism, precum și de administrarea anumitor substanțe care blochează absorbția celui radionuclid, accelerează excreția sau funcționează ca agent chelator. Este de asemenea importantă și radioprotecția persoanei care vine prima dată în contact cu cel contaminat, cât și a personalului medical care se ocupă de acești pacienți.

E-POSTERE

16. IDENTIFICAREA DE BIOMARKERI IMAGISTICI IN SINDROMUL CARDIORENAL PE MODEL ANIMAL PRIN ¹⁸F-FDG PET/MRI - REZULTATE PRELIMINARE-

L. Agrigoroaie¹, D.M. Furcea¹, Cristina Uritu², Gabriela Stanciu², C.T. Mihai², I. Gardikiotis², R. Iliescu^{1,2}, Cipriana Stefanescu^{1,2}, M.M. Gutu¹

¹Universitatea de Medicina si Farmacie "Gr. T. Popa", Iasi, Romania

²Centru Avansat de Cercetare-Dezvoltare in Medicina Experimentala CEMEX, Iasi, Romania

Introducere si obiective: Sindromul cardiorenal reprezinta o entitate clinico-patologica prevalenta, cu markeri prognostici si predictivi inca nedefiniti. Replicarea conditiilor fiziopatologice a afectiunii la animal este o arie activa de continua cercetare. In prezenta lucrare, raportam rezultatele preliminare a investigarii validitatii unui model animal pentru sindromul cardiorenal prin imagistica multimodala cu 2-deoxi-2-[fluor-18] fluoro-D-glucoza (¹⁸F-FDG) PET/MRI.

Materiale si Metode: Am studiat un grup de 24 de sobolani Wistar, masculi, repartizati in mod egal si aleatoriu in 3 loturi: control (L1), insuficienta cardiaca (L2), sindrom cardiorenal (L3). Insuficienta cardiaca a fost indusa prin administrare intraperitoneala de doxorubicina, iar sindromul cardiorenal prin nefrectomie subtotala la jumatate din subiectii lotului L2. Scanarile cu ¹⁸F-FDG PET/MRI au fost efectuate la debutul studiului pentru L1, dupa 6 saptamani pentru L2, iar pentru L3 dupa 18 saptamani. Pe imaginile reconstruite, regiuni de interes au fost trasate pentru parenchimul renal si miocard. Cinetica radiofarmaceuticului a fost analizata prin calcularea valorilor de captare standardizate (SUV) si examinarea curbelor pentru determinarea timpilor de eliminare la 50% (T50), respectiv la 75% (T75) din valoarea maxima a SUV.

Rezultate: La lotul L1 s-a observat o diferenta semnificativ statistica la nivelul miocardului pentru markerul T75 (media T75_{L1}=1.1 vs. T75_{L2}=1.9 min, p<0.05). In schimb, subiectii din lotul L3 versus cei din L1 au prezentat un timp de eliminare prelungit atat pentru T75 cat si pentru T50 (media T75_{L1}=1.1 vs. T75_{L3}=40 min, p<0.001; media T50_{L1}=3.5 vs. T50_{L3}=40 min, p<0.001); in plus, comparatia dintre lotul L3 si L2 a demonstrat persistenta individualizarii lotului L3 (media T75_{L2}=1.9 vs. T75_{L3}=40 min, p<0.001; media T50_{L2}=5.9 vs. T50_{L3}=40 min, p<0.05)

Concluzii: Comportamentul cineticii radiofarmaceuticului la subiectii cu sindrom cardiorenal are potential discriminator pentru grupurile din cadrul studiului, astfel confirmandu-ne ipoteza investigata. Prin urmare, vom explora mai departe identificarea de biomarkeri pentru monitorizarea afectiunii prin ¹⁸F-FDG PET.

Cuvinte cheie: cardiorenal , Wistar, PET/MRI, radiofarmaceutic

¹⁸F-FDG PET/MRI BIOMARKERS EXPLORATION IN A SMALL ANIMAL MODEL OF CARDIORENAL SYNDROME -PRELIMINARY RESULTS-

L. Agrigoroaie¹, D.M. Furcea¹, Cristina Uritu², Gabriela Stanciu², C.T. Mihai², I. Gardikiotis², R. Iliescu^{1,2}, Cipriana Stefanescu^{1,2}, M.M. Gutu¹

¹University of Medicine and Pharmacy, Iasi, Romania

²Advanced Center for Research and Development in Experimental Medicine CEMEX, Iasi, Romania

Introduction and Objectives: Cardiorenal syndrome is a prevalent clinical condition, with yet undefined prognostic or predictive biomarkers. Animal modelling of the disease and its pathophysiological underpinnings is a growing area of research. We report preliminary results in investigating the validity of a rat model for cardiorenal syndrome by multimodal imaging with 2-deoxy-2-[fluorine-18]fluoro-D-glucose (¹⁸F-FDG) PET/MRI.

Methods and Materials: We studied a number of 24 male Wistar rats, equally and randomly divided into 3 lots: control (L1), heart failure (L2) and cardiorenal group (L3). Heart failure was induced by intraperitoneal doxorubicin administration and cardiorenal syndrome by subsequent sub-total nephrectomy in half of them. ¹⁸F-FDG PET/MRI scans (nanoScan PET/MRI, Mediso Ltd.) were acquired at week 0 for L1, at week 6 for L2 and at week 18 for L3. On the reconstructed images, regions of interest for renal and heart parenchyma were drawn. Tracer kinetics were assessed by calculating standardized uptake values (SUV) and washout times at 50% (T50) and at 75% (T75) of peak SUV.

Results: L1 and L2 displayed a statistically significant difference only in myocardial T75 (mean $T75_{L1}=1.1$ vs. $T75_{L2}=1.9$ min, $p<0.05$). In contrast, subjects from L3 vs. L1 exhibited prolonged myocardial washout times at T75 and at T50 (mean $T75_{L1}=1.1$ vs. $T75_{L3}=40$ min, $p<0.001$; mean $T50_{L1}=3.5$ vs. $T50_{L3}=40$ min, $p<0.001$); moreover, comparing L3 vs. L2 still exhibited significantly distinct temporal patterns (mean $T75_{L2}=1.9$ vs. $T75_{L3}=40$ min, $p<0.001$; mean $T50_{L2}=5.9$ vs. $T50_{L3}=40$ min, $p<0.05$).

Conclusion: The distinct dynamics of radiotracer kinetics in cardiorenal subjects has potential for discriminating between study groups, hence confirming the hypothesis under study. This outcome warrants further exploration of novel biomarkers for disease monitoring through ^{18}F -FDG PET.

Keywords: cardiorenal, Wistar, PET/MRI, radiotracer

17. HEPATIC UPTAKE ON $^{99\text{m}}\text{Tc}$ HYDROXYMETHYLENE DIPHOSPHONATE BONE SCAN IMAGING: A CASE REPORT

Iulia Andreea Chiriac¹, Gabriela Voicu², Mariana Purice², Diana Neagu², F. Alexiu², A.L. Goldstein¹

¹National Institute of Endocrinology "C.I. Parhon" Endocrinology and Isotopic Therapy Department, ²Nuclear Medicine Laboratory,

Introduction. Bone scans using Tc-99m diphosphonate compounds are the most commonly used procedures in conventional nuclear medicine in Romania. We present a case report of a 51 year old male with colorectal cancer that was referred to our center for skeletal metastatic disease evaluation, after his 4th cycle of chemotherapy for preoperative tumor cytoreduction.

Material and Methods. An intravenous injection of 666MBq $^{99\text{m}}\text{Tc}$ - hydroxymethylene diphosphonate (HDP) was administered to the patient. Anterior and posterior views of the entire skeleton were acquired 2h post injection; also dorso-lumbar region static images were obtained in right anterior oblique and left posterior oblique at $30^\circ/150^\circ$ angles.

Results. After intravenous injection, $^{99\text{m}}\text{Tc}$ -HDP rapidly distributes into the extra-cellular fluid and is quickly taken up into the bone. It is eliminated by the kidneys and bladder so it is normal to see residual soft tissue activity in the kidneys and bladder. The patient had several heterogeneous areas of uptake in the hepatic region that correlated with the liver metastases described on the computerized scan.

Discussion and conclusion. Soft tissue uptake must be differentiated from bone pathology. Similar cases of hepatic secondary lesions that uptake $^{99\text{m}}\text{Tc}$ - diphosphonate compounds were described in the literature.

The mechanism of localization in the liver metastases is thought to be a combination of calcifications in the tumor and binding of the macromolecules to tumor cells in the metastatic areas.

The low sensitivity and specificity of bone seeking agents in this cases cannot point a correlation between the uptake of $^{99\text{m}}\text{Tc}$ -HDP in the metastatic foci and the outcome of the patient. Other nuclear medicine procedures can be used to assess chemotherapy response and patient prognosis.

Key words: bone scan, hepatic uptake, $^{99\text{m}}\text{Tc}$ -HDP in liver metastases

18. BONE SCINTIGRAPHY AS PRELIMINARY STEP IN IDENTIFYING SCHNITZLER'S SYNDROME VS. ERDHEIM-CHESTER DISEASE

Polixenia-Laura Grecu², Daniela Chețan¹, Roxana Iacob³, Ș. Bîlha¹, Cipriana Ștefănescu^{2,3}, A.G. Naum^{1,3}

¹Nuclear Medicine Laboratory, Regional Institute of Oncology Iasi, Romania

²Nuclear Medicine Laboratory, County Emergency Hospital „Sf. Spiridon” Iasi, Romania

³University of Medicine and Pharmacy U.M.F „Grigore T. Popa” Iasi, Romania

Introduction. A 68 years old man complained of bones pain and multiple fractures in the last 15 years, with osteoporosis and persistent leukocytosis was sent for bone scintigraphy after surgery and radiotherapy in 2018 for a right submandibular carcinoma. **Material and Methods.** The bone scan obtained 2h after injection of 530 MBq of ^{99m}Tc-HDP showed abnormal tracer uptake as hot spots among the body and an abnormal pattern revealed in the lower half of the bilateral femur and the upper third of the bilateral tibia. **Discussions.** This led us to the probability of differential diagnosis between Schnitzler's syndrome and Erdheim-Chester disease. According to Strasbourg diagnostic criteria, Schnitzler's syndrome is a rare combination of two major criteria (monoclonal immunoglobulin M or G and chronic urticaria) with at least two (if immunoglobulin M) or three (if immunoglobulin G) minor criteria (abnormal bone structure, fever, proinflammatory state, neutrophilic urticarial dermatosis on skin biopsy). Contrastingly, Erdheim-Chester disease, an uncommon non-Langerhans cell histiocytosis, is symmetrical osteosclerosis of the long bones with corresponding and almost pathognomonic radiological and nuclear medicine correlations. **Conclusion.** Bone scintigraphy was the first investigation that led to a possible response for the pathological background of the patient. To confirm one of the presumptive diagnostics obtained from the scintigraphic investigation, the next step should be to screen for monoclonal immunoglobulin and also bone biopsy should be performed to exclude possible histiocytic infiltration. **Key words:** bone scintigraphy, Schnitzler's syndrome, Erdheim-Chester disease.

RO: BONE SCINTIGRAPHY AS PRELIMINARY STEP IN IDENTIFYING SCHNITZLER'S SYNDROME VS. ERDHEIM-CHESTER DISEASE

Introduction. Un bărbat în vârstă de 68 de ani acuză dureri osoase și fracturi multiple în ultimii 15 ani, cu osteoporoză și leucocitoză persistentă, a fost trimis pentru a fi investigat scintigrafic după ce a fost diagnosticat și operat de carcinom submandibular în 2018, urmat de radioterapie. **Material and Methods** Scanarea osoasă a fost obținută la 2 ore după injectarea a 530 MBq de ^{99m}Tc-HDP și a evidențiat multiple situsuri hiperfixatoare la nivelul scheletului și o intensă hiperfixare la nivelul jumătății inferioare femurale și a treimii superioare a tibiei, bilateral. **Discussions.** Acest lucru ne-a condus la probabilitatea unui diagnostic diferențial între sindromul Schnitzler și boala Erdheim-Chester. Conform criteriilor de diagnosticare de la Strasbourg, sindromul Schnitzler este o combinație rară a două criterii majore (imunoglobulina monoclonală M sau G și urticarie cronică) cu cel puțin două criterii minore (dacă imunoglobulina M este cu o valoare anormală) sau trei (imunoglobulina G) precum: structură osoasă anormală, febră, stare proinflamatorie, dermatoză urticarică neutrofilică la biopsia cutanată. În contrast, boala Erdheim-Chester reprezintă o histiocitoză non-Langerhans și se caracterizează prin osteoscleroză simetrică a oaselor lungi cu confirmare radiologică sau scintigrafică. **Conclusion.** Scintigrafia osoasă a fost prima investigație ce a condus la un posibil răspuns pentru istoricul patologic al pacientului. Pentru a confirma unul din diagnosticele prezumtive obținute la scintigrafia osoasă, următorul pas ar trebui să fie dozarea imunoglobulinei monoclonale și efectuarea biopsiei osoase pentru a exclude o posibilă infiltrare histiocitară. **Key words:** scintigrafie osoasă, sindromul Schnitzler, boala Erdheim-Chester.

19.LEZIUNE MUSCULARĂ ACTIVĂ METABOLIC LA EXAMINAREA PET-CT F18-FDG, LA O PACIENTĂ CU CANCER TIROIDIAN PAPILAR

H. Haba, G. Rusu, L. Hitu, G. Kermoison, A. Alexiev, E. Spinu, K. Gabora, E. Olariu, D. Piciu
“Prof. Dr. Ion Chiricuta” Institute of Oncology, Cluj Napoca, ROMANIA

Introducere: Carcinomul tiroidian papilar reprezintă cea mai frecventă patologie malignă a glandei tiroide, fiind o formă de cancer tiroidian diferențiat. Este o tumoră cu prognostic bun, fiind tratată prin tiroidectomie totală și/sau radioiodoterapie cu I-131. În cazurile cu determinări secundare la distanță, cele mai frecvente localizări sunt plămânul, sistemul osos și cerebral. În mod excepțional, pot exista și alte localizări secundare.

Prezentarea cazului: Vom prezenta cazul unei paciente în vârstă de 69 de ani, diagnosticată cu carcinom tiroidian papilar. Pacienta a fost tratată prin tiroidectomie totală și radioiodoterapie, în prezent aflându-se sub medicație substitutivă hormonală tiroidiană.

Datorită persistenței valorilor crescute ale tiroglobulinei, în prezența unor scanări de corp întreg cu I-131 negative, pacienta este referată pentru efectuarea unei examinări PET-CT cu F18-FDG. Aceasta evidențiază prezența unei formațiuni hiperactive metabolic la nivel muscular fesier dreapta și lipsa altor leziuni secundare la distanță.

Prin ecografia efectuată ulterior, se observă formațiunea descrisă la examinarea PET-CT. Aceasta este localizată fesier dreapta, la 6 centimetri de marginea superioară a șanțului interfesier, având de asemenea calcificări intranodulare (patognomonic pentru carcinomul tiroidian diferențiat) și fiind intens vascularizată.

Având în vedere existența leziunii descrise, corelată cu valorile crescute ale tiroglobulinei și aspectul imagistic, s-a recomandat biopsia acesteia. Aspectul ecografic corelat cu nivelul tiroglobulinei și cu rezultatul biopsiei, pledează pentru originea tiroidiană a leziunii.

Concluzie: Corelarea datelor clinice, imagistice și de laborator este esențială în abordarea pacienților oncologici. Examinarea PET-CT s-a dovedit utilă în cazul de față, pentru evidențierea leziunilor secundare la distanță, având în vedere și localizarea neobișnuită intramusculară.

Particularitățile cazului: Leziunile secundare musculare în cadrul carcinomului tiroidian diferențiat sunt rare, dar pot fi evidențiate ocazional pe examinările imagistice și trebuie diferențiate de contaminări ale pielii.

METABOLICALLY ACTIVE MUSCULAR LESION ON F18-FDG PET-CT EXAMINATION OF A PATIENT WITH PAPILLARY THYROID CARCINOMA

H. Haba, G. Rusu, L. Hitu, G. Kermoison, A. Alexiev, E. Spinu, K. Gabora, E. Olariu, D. Piciu

“Prof. Dr. Ion Chiricuta” Institute of Oncology, Cluj Napoca, ROMANIA

Introduction: Papillary thyroid carcinoma represents the most frequent malignancy of the thyroid gland, being a differentiated form of this pathology. Treated by total thyroidectomy and/or radioiodine treatment with I-131, it is a tumor with good prognosis. If a distant metastasis occurs, the most affected organs are the lungs, skeletal system and brain as well. In exceptional cases other sites may exist.

Case presentation: We report a case of a 69 years old patient, who had been diagnosed with papillary thyroid carcinoma. She was undergoing a total thyroidectomy and radioiodine treatment, currently being on hormonal substitution medication.

Due to the consistent high serum thyroglobulin level paired with a negative whole body scintigraphy scan with I-131, the patient is referred to a PET-CT examination with F18-FDG. The result shows a metabolically hyperactive structure in the right gluteal region, without any other distant lesions.

A local Doppler-US examination reveals the structure described on the PET-CT presenting intense vascularisation and intranodular calcifications (pathognomonic for differentiated thyroid cancer), establishing the exact localization on the right gluteal area at 6 cm from the superior pole of the intergluteal cleft.

Considering the US and PET-CT findings, correlating with the high serum thyroglobulin level and the imagistic characteristics, a biopsy was indicated. The ultrasound aspect, the laboratory findings and the biopsy results suggest a thyroid origin of this lesion.

Conclusion: An appropriate treatment plan of an oncology patient is the result of integrating the clinical, imagistic and laboratory findings. In our case report the PET-CT examination had the key role in discovering the distant secondary lesion, even if the intramuscular localization is rare.

Particularity of this case: Secondary muscular lesions in the differentiated papillary carcinoma are rare, but they can be an occasional imagistic finding and they could be easily mistaken for skin contamination.

20.UN SIMPLU CARCINOM TIROIDIAN PAPILAR CE S-A TRANSFORMAT INTR-O DILEMĂ TERAPEUTICĂ

L.Hîțu, G. Kermoison, G. Rusu, A. Alexiev, E. Spînu, K. Gabora, E. Olariu, A. Piciu, D. Piciu;

“Prof. Dr. Ion Chiricuță” Institutul Oncologic, Cluj-Napoca, ROMANIA.

Introducere: Fiind cea mai comună formă de cancer tiroidian diferențiat, carcinomul tiroidian papilar este aproape întotdeauna curabil. Provocarea apare atunci când există cazuri cu factori de risc importanți la care nivelul de TG rămâne crescut inclusiv după secvența chirurgicală și terapia cu iod.

Prezentarea cazului: Raportăm cazul unui pacient de 18 ani, care s-a prezentat într-un serviciu medical cu o masă latero-cervicală dreaptă asimptomatică iar în urma examenelor medicale specifice s-a decis efectuarea tiroidectomiei totale și limfadenectomiei selective.

Analiza histopatologică a confirmat un carcinom papilar pT3 N1b Mx L1 V0. Decizia pentru tratamentul cu iod radioactiv a fost luată datorită factorilor prognostici: tipul și dimensiunea tumorii, invazia țesutului peritiroidian și limfatică precum și nivelul crescut al tiroglobulinei (171,7 ng / ml); cu anticorpi negativi (anti-Tg <115 UI / ml), clinic și ecografic negativ.

Examinarea post-terapeutică I-131 WBS a arătat un rest minim de țesut fixant în loja tiroidiană. Pacientul a început terapia supresivă tiroidiană. Următorul control clinic și ecografic a fost negativ, Tg pozitivă (Tg - 126,8 ng / ml); a fost făcută a doua cură de iod radioactiv, cu WBS negativ.

În următorii 5 ani, pacientul a beneficiat de terapii cu iod radioactiv (doză totală de 638,5 mCi I-131) și 13 controale oncologice (nivelul Tg a fluctuat între 126,6 ng / ml și 290,2 ng / ml), cu scanările de corp întreg negative, ecografiile cervicale negative, două examinări CT de corp întreg negative, două RMN-uri de corp întreg- negative în 2018/ 2019 și trei examinări 18 F-FDG PET/CT în ultimii 3 ani- la fel negative. Nu a existat o evoluție agresivă a Tg, iar timpul de dublare a acesteia fost de 19 luni.

Din cauza absenței bolii structurale, tratamentul cu inhibitori de tirozin-kinază a fost temporizat și s-a decis doar supravegherea pacientului. Datele cazului au fost încărcate pe platforma Endo-ERN (Rețeaua virtuală a centrelor europene de referință pentru boli endocrine rare), solicitând mai multe opinii cu privire la strategia de tratament.

Concluzia: În astfel de cazuri complexe, cooperarea între centrele de referință este crucială în adaptarea strategiei terapeutice.

AN ORDINARY THYROID CARCINOMA BECOMING A TREATMENT DILEMMA

L.Hîțu, G. Kermoison, G.Rusu, A. Alexiev, E.Spinu, K.Gabora, E. Olariu, A.Piciu, D.Piciu;

“Prof. Dr. Ion Chiricuta” Institute of Oncology, Cluj-Napoca, ROMANIA.

Introduction: As it is the most common form of well-differentiated thyroid cancer, Papillary carcinoma (PTC) is almost always curable. The challenging part consists of high risk patients with persistent increased thyroglobulin level, after total thyroidectomy and radioiodine therapy.

Case report: We report a 18-year-old patient's case, who was admitted for an asymptomatic right latero-cervical mass and after specific exams the patient was transferred for total thyroidectomy and selective lymphadenectomy.

Histopathological analysis confirms a pT3 N1b Mx L1 V0 papillary carcinoma. The decision for radioactive iodine treatment was made given the type and size of the tumor, the perithyroid and lymphatic invasion and the elevated thyroglobulin level (171.7 ng/mL); anti-thyroglobulin antibodies were negative during the course of the disease (anti-Tg< 115 UI/mL). At that moment the clinical exam and cervical ultrasound were negative.

The post-therapy I-131 WBS showed minimal radioiodine uptake in thyroid bed. The patient started thyroid suppression therapy. The next check-up was clinical and ultrasound negative, Tg positive (Tg - 126.8 ng/mL); a second radioiodine was administered, with the WBS negative.

Next 5 years the patient had radioiodine therapies (total dose of 638,5 mCi I-131) and 13 oncological check-ups (Tg level fluctuated between 126.6 ng/mL and 290.2 ng/mL), with WBS's always negative, negative ultrasounds; He had two whole body negative CT examinations, two negative WB-MRI in 2018 and 2019 and three 18F-FDG PET/CT negative examinations during the last 3 years. There was no aggressive progression of Tg and the doubling time was of 19 months.

Because of the absence of structural disease, the treatment with TKI's was delayed and the option of surveillance was decided. The case was upload on Endo-ERN (virtual Network of European Reference Centers) asking for more opinions about the treatment strategy.

Conclusion: In such complex cases, the cooperation between Reference Centers is crucial for adaptation of the therapeutic strategy.

21. HORSESHOE KIDNEY VISUALISATION: 99MTC-DMSA RENAL SCAN VS ULTRASONOGRAPHY

Wael Jalloul¹, Alexandru Tarca¹, Mihai Gutu^{1,2}, Russu Radu³, Irina Cristina Grierosu^{1,2}, Cipriana Ștefănescu^{1,2}

¹*Nuclear Medicine Laboratory, County Emergency Hospital „Sf. Spiridon” Iasi, Romania*

²*University of Medicine and Pharmacy U.M.F „Grigore T. Popa” Iasi, Romania*

³*Emergency Children Hospital „Sfânta Maria” Iași, Romania*

Background and Aim: Horseshoe kidney (HSK) is a common congenital renal defect found in 0.25% of the general population. In most instances, both kidneys fuse at their lower poles with the isthmus bridging the two renal masses. HSKs usually demonstrate three anatomical anomalies: ectopic position, malrotation, and variable vasculature.

The purpose of our study was to describe the 99mTc-dimercaptosuccinic acid (DMSA) renal scan aspects and emphasize its importance in a case of HSK which was not diagnosed with ultrasonography.

Materials and Methods: We present the case of 13-year-old girl randomly diagnosed, using ultrasonography, with a congenital right kidney hypoplasia after a suspicion of urinary tract infection. The negative uroculture dismissed the infection. We also mention that the urea and creatinine levels were normal. The next step was to send the girl for a 99mTc-DMSA renal scan in order to obtain further informations about differential function and cortical outline status of the right kidney.

Results and Discussions:

Renal ultrasound:

-Small right kidney with a poor corticomedullary differentiation.

-Left kidney with normal dimensions and a corticomedullary interface integrity maintained.

99mTc-DMSA renal scan:

The left renal parenchyma is situated in the left renal fossa and continues at the inferior pole with a reniform parenchyma mass which passes through the medial line and occupies the right renal fossa.

This scintigraphic aspect is specific for horseshoe kidney, bonded by an isthmus parenchyma.

Conclusion:

99mTc-DMSA renal scan is an essential tool in detection of HSK and a better comprehension of the connecting bridge of the renal parenchyma.

It is indispensable in addition to ultrasonography as it gives, with the minimum of invasivity, functional information and conclusive remarks on drainage pattern, which helps in choosing surgical/non-surgical treatment for appropriate patients.

Key words: Horseshoe Kidney, 99mTc-DMSA Renal Scan, Renal Ultrasound.

22. TRANSPLANTUL AUTOLOG DE CELULE STEM MEDULARE AMELIOREAZĂ FUNCȚIA CINETICĂ DIN ARIA INFARCTULUI MIOCARDIC LA ECG-GATED SPECT

Miruna Mihaela Micheu¹, Gabriela Nicula¹, Nicoleta Monica Popa-Fotea¹, Ileana Monica Stoian¹, Nicoleta Oprescu¹, C.A. Mihai¹, V. Bataila¹, L. Calmac¹, Magdalena Stoica¹, Elena Luminata Stanciulescu¹, V. Ploscaru¹,

Alina Ioana Scarlatescu¹, Alexandru Scafa-Udrisite^{1,2}, Maria Dorobantu^{1,2}

¹*Departamentul de Cardiologie, Spitalul Clinic de Urgență, București, România*

²*Universitatea de Medicină și Farmacie „Carol Davila”, București, România*

Introducere: Cardiomiopatia ischemică cu fracție de ejeție a ventriculului stâng (FEVS) scăzută post-infarct miocardic acut are o rată de mortalitate și morbiditate crescută. Mai mult decât atât, tratamentul actual nu se adresează cauzei, ci consecințelor infarctului miocardic. Celulele stem medulare autologe sunt o posibilă soluție pentru cazurile de insuficiență cardiacă post infarct miocardic aflate deja în tratament maximal conform ghidurilor.

Material și metode: 20 de pacienți cu infarct miocardic anterior și FEVS $\leq 35\%$ la o lună de la evenimentul ischemic acut au fost randomizați fie în grupul cu celule stem injectate intracoronarian, fie în grupul control care nu a primit tratament cu celule stem. Toții pacienți au fost tratați conform ghidurilor și nu mai aveau nicio leziune coronariană semnificativă hemodinamic. Aceștia au fost urmăriți la 1 și 3 luni de la injectarea celulelor stem cu un protocol ce a inclus examinare clinică, evaluarea calității vieții, markeri inflamatori, ecocardiografie și tomografie computerizată cu emisie de foton unic ghidată ECG (SPECT ECG-gated).

Rezultate: La includere nu au existat diferențe semnificative ale parametrilor evaluați prin SPECT ECG-gated. La 3 luni după injectarea celulelor stem s-a identificat o reducere semnificativă a scorului cinetic în teritoriul arterei descendente anterioare ($p=0.05$) comparativ cu grupul control unde nu s-a observat nicio ameliorare. În grupul activ, cu celule stem, a existat și o reducere a severității și extensiei defectelor din zona arterei descendente anterioare, dar fără semnificație statistică.

Concluzii: Celulele stem medulare autologe ameliorează funcția cinetică a ventriculului stâng în zona afectată de infarctul miocardic așa cum se arată prin scăderea scorului cinetic la SPECT ECG-gated la 3 luni de la injectarea celulelor stem.

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Cuvinte cheie: celule stem, cardiomiopatie ischemică, fracție de ejeție a ventriculului stâng, scor cinetic

AUTOLOGOUS BONE MARROW STEM CELLS IMPROVES THE KINETIC FUNCTION OF THE INFARCTED AREA AT ECG-GATED SPECT

Miruna Mihaela Micheu¹, Gabriela Nicula¹, Nicoleta Monica Popa-Fotea¹, Ileana Monica Stoian¹, Nicoleta Opreșcu¹, C.A. Mihai¹, V. Bataila¹, L. Calmac¹, Magdalena Stoica¹, Elena Luminita Stanciulescu¹, V. Ploscaru¹, Alina Ioana Scarlatescu¹, Alexandru Scafa-Udris^{1,2}, Maria Dorobantu^{1,2}

¹Cardiology Department, Emergency Clinical Hospital, Bucharest, Romania

²University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania

Introduction: Ischemic cardiomyopathy with reduced left ventricle ejection fraction (LVEF) after acute myocardial infarction has high morbidity and mortality. Furthermore, the existing treatment does not address the cause, but rather the consequences of myocardial infarction. Autologous bone marrow stem cells may be one possible therapeutics for individuals with heart failure after myocardial infarction and maximal conventional treatment.

Material and methods: Twenty patients remaining at one month after anterior myocardial infarction with LVEF $\leq 35\%$ were randomized to either bone marrow stem cells intracoronary injection or to the control group, which did not receive the stem cells treatment. All patients were treated according to the standard guidelines and had no remaining significant coronary lesions. They were followed-up at 1 and 3 month after stem cells injection with a protocol including clinical evaluation, quality of life assessment, inflammatory markers, echocardiography and rest ECG-gated single photon emission computer tomography (ECG-gated SPECT).

Results: At inclusion there were no significant differences in the parameters measured at ECG-gated SPECT. At 3 months after stem cell injection there was a significant reduction of the left anterior descending artery (LAD) kinesis score ($p=0.05$) compared with the control group where there was no significant improvement. In the stem cell group, there was also a reduction in the severity and extension of defects in the LAD area, but without statistical significance.

Conclusions: Bone marrow stem cells improves the kinetic function of the left ventricle in the area affected by myocardial infarction as shown at ECG-gated SPECT by the kinesis score decrease at three months after stem cells injection.

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Keywords: stem cells, ischemic cardiomyopathy, left ventricle ejection fraction, kinetic score

23. PACIENȚII CU CANCER TIROIDIAN DIFERENȚIAT TRATAȚI CU I-131: RECOMANDĂRI INDIVIDUALIZATE DE RADIOPROTECȚIE

Moiescu-Goia Cristina¹, Sabo Alexandrina¹, Cekan Iulia¹, Pestean Claudiu^{1,2}, Olariu Elena¹, Piciu Doina^{1,2}

¹*Institutul Oncologic "Prof. Dr. Ion Chiricuță" Cluj-Napoca*

²*Universitatea de Medicină și Farmacie "Iuliu Hațieganu" Cluj-Napoca*

Introducere: Pacienții cu cancer tiroidian diferențiat care beneficiază de radioiodoterapie necesită spitalizare. Normele de securitate radiologică pentru practica de medicină nucleară emise de către CNCAN impun ca pacienții să primească recomandări legate de măsurile de radioprotecție pe care trebuie să le respecte în perioada următoare după externare. Scopul studiului este acela de a evidenția importanța individualizării recomandărilor pe care pacienții le primesc la externare funcție de debitul măsurat.

Metode: Studiul s-a efectuat pe un lot de 11 pacienți cu cancer tiroidian diferențiat internați în Laboratorul de medicină nucleară a Institutului Oncologic "Prof. Dr. Ion Chiricuță" din Cluj-Napoca în decurs de 1 lună. Pacienții participanți la studiu (2 bărbați și 9 femei) au prezentat stadiul T1b până la stadiul T4c cu metastaze ganglionare sau pulmonare și cu vârsta cuprinsă între 23-80 ani. Activitatea de I-131 administrată a fost cuprinsă între 1.1 GBq și 3,7 GBq, cu o valoare medie +/-SD de 2.78 GBq +/- 0.96GBq. S-au efectuat măsurători în zile consecutive ale debitului pacienților, iar în ziua externării s-a măsurat și debitul lenjeriei utilizate de către pacienți pe perioada spitalizării.

Rezultate: Cei 11 pacienți internați au fost măsurați repetat, iar valoarea debitului înregistrat la distanța de 1m a fost cuprins între 77,4-17 μ Sv/h în prima zi postadministrare a terapiei cu I-131; pentru a ajunge la valori cuprinse între 10,4 și 1,8 μ Sv/h după 3 sau 4 zile de spitalizare. În ziua externării fiecărui pacient i-a fost măsurată lenjeria utilizată pe perioada internării. Valorile înregistrate au fost cuprinse între 2,34-41,7 μ Sv/h, cu o pondere de 54,5% sub valoarea de 10 μ Sv/h. Rezultatele măsurătorilor efectuate relevă lipsa unei corelații statistice semnificative cu activitatea de I-131 administrată, $p=0.736$.

Concluzii: Studiul efectuat a evidențiat importanța individualizării recomandărilor privind măsurile de radioprotecție în funcție de valorile debitului măsurat la externarea pacienților, nu a activității de I-131 administrate.

Cuvinte cheie: cancer tiroidian, recomandări de radioprotecție, I-131

DIFFERENTIATED THYROID CANCER PATIENTS TREATED WITH I-131: INDIVIDUALIZED RECOMMENDATION OF RADIOPROTECTION

Moiescu-Goia Cristina¹, Sabo Alexandrina¹, Cekan Iulia¹, Pestean Claudiu^{1,2}, Olariu Elena¹, Piciu Doina^{1,2}

¹The Institute of Oncology "Prof. Dr. Ion Chiricuța" Cluj-Napoca

²The University of Medicine and Pharmacy "Iuliu Hațieganu" Cluj-Napoca

Introduction: Patients with differentiated thyroid cancer who receive radioiodine-therapy require hospitalization. Radiological safety standards for nuclear medicine practice issued by CNCAN require that patients receive recommendations on radiation protection measures that have to meet in the next period after discharge. The purpose of the study is to highlight the importance of the individual recommendations that patients receive to discharge depending on the measured flow.

Methods: The study was conducted on a sample of 11 patients with differentiated thyroid cancer admitted in Laboratory of Nuclear Medicine from the Institute of Oncology "Prof. Dr. Ion Chiricuța" of Cluj-Napoca within one months. The subjects (two men and nine women) had T1b stage to stage lymph node and lung metastases T4c and aged between 23-80 years. I-131 activity was between 1.1GBq administrated and 3.7 GBq, with a mean +/- SD +/- 2.78 GBq 0.96GBq. Measurements were performed on consecutive days of patient flow, and in day of discharge was measured even the flow of personal lingerie used by patients during hospitalization.

Results: The 11 patients hospitalized were measured repeatedly, and the recorded flow at 1m distance was between 77.4 to 17 μ Sv/h on the first day post administration therapy with I-131; to reach values between 10.4 and 1.8 μ Sv/h after 3 or 4 days of hospitalization. On discharge of each patient was measured personal lingerie used during hospitalization. The recorded values were between 2.34 to 41.7 μ Sv/h, with a weight of 54.5% below 10 μ Sv/h. The results of the measurements revealed the lack of statistically significant correlations with activity of I-131 administered, $p = 0.736$.

Conclusions: The study highlighted the importance of the individual recommendations on radiation protection based on measured flow values to discharge patients not administered activity of I-131

Keywords: thyroid cancer, radiation protection recommendations, I-131

24.MIELOM MULTIPLU CU METASTAZE MUSCULARE ȘI CUTANATE ADEVARAT SAU FALS?

E. Olariu¹, M.I. Larg^{1,2}, K.Gabora^{1,2}, L.Hîțu¹, E.Spînu¹, B. Grădinaru¹, G.Kermoison¹, G.Rusu¹, A. Alexiev¹, C. Peștean^{1,2}, D.Piciu^{1,2}

¹*Institutul Oncologic “Prof. Dr. Ion Chiricuță” Cluj-Napoca, România.*

²*Universitatea de Medicină și Farmacie “Iuliu Hațieganu” Cluj-Napoca, România*

Introducere: Mielomul multiplu reprezintă aproximativ 10 % din numărul total de patologii maligne hematologice. Evoluția acestei boli este adesea intricată și de multe ori asimptomatică, ceea ce conduce la un diagnostic tardiv. Identificarea imagistică a schimbării profilului de agresivitate reprezintă în acest moment un pas important spre o terapie personalizată.

Prezentarea cazului: Pacient în vârstă de 60ani cu APP de diabet zaharat tratat cu ADO, HTAE și carcinom bazocelular nazal este diagnosticat cu mielom multiplu nesecretant stadiul III ISS din octombrie 2016, operat repetat pentru un plasmocitom vertebral L3, ultima intervenție în octombrie 2018, cu multiple recăderi și cu evoluție spre plasmocitoame extramedulare, efectuând și transplant medular. Terapia inițială a constat din 2 cure VAD și 5 cure Bortezomib-Doxorubicină lipozomală-Dexametazonă, urmată de recădere și autotransplant. În septembrie 2018 s-a solicitat o examinarea PET/CT care a evidențiat: multiple leziuni secundare osoase, ganglionare inghinal bilateral și leziuni musculare în compartimentul anterior al coapsei stângi. Datorită evoluției bolii s-a schimbat terapia la Carfilzomib cu Dexametazonă, și după 5 cure a urmat o evaluare a răspunsului la tratament printr-o nouă examinare PET/CT cu FDG efectuată în aprilie 2019, care a evidențiat o evoluție semnificativă a bolii sub raport numeric, dimensional și metabolic cu apariția de leziuni noi musculare, cutanate și ganglionare foarte intense active FDG. Având în vedere evoluția acută sub tratament, s-a ridicat suspiciunea existenței unei alte patologii asociate (metastaze musculare și cutanate din altă tumora primară? - melanom/carcinom bazocelular cunoscut la acest pacient). Menționăm că în urma examinării PET/CT cu FDG pacientul a fost referat pentru efectuarea unei biopsii musculare și confirmare histopatologică.

Concluzii: Examinarea PET/CT cu FDG, spre deosebire de imagistica morfologică convențională, reușește să identifice asocierea unei componente agresive în cadrul mielomului multiplu, a schimbării profilului de activitate prin apariția de clone celulare cu activitate de proliferare diferită, precum și să identifice posibilitatea asocierii de patologii neoplazice noi.

Cuvinte cheie: mielom multiplu, PET/CT, FDG, plasmocitom

MULTIPLE MYELOMA WITH MUSCULAR AND CUTANEOUS METASTASIS - TRUE OR FALSE?

E. Olariu¹, M.I. Larg^{1,2}, K.Gabora^{1,2}, L.Hîțu¹, E.Spînu¹, B. Grădinaru¹, G.Kermoison¹, G.Rusu¹, A. Alexiev¹, C. Peștean^{1,2}, D.Piciu^{1,2}

¹*The Oncology Institute “Prof. Dr. Ion Chiricuță”, Cluj-Napoca, Romania*

²*University of Medicine and Pharmacy “Iuliu Hațieganu” Cluj-Napoca, Romania*

Introduction: Multiple myeloma accounts for 10% of all haematological neoplasia. The course of the disease is difficult and frequently asymptomatic which leads to a very late diagnosis. Imaging identification of the aggressiveness and changing in the course of the disease is mandatory nowadays if we want to offer a personalized treatment.

Case report: We present the case of a 60y old patient with personal history of diabetes treated with oral antidiabetics, hypertension and nasal basocellular carcinoma which is diagnosed with nonsecretory type of multiple myeloma stage III ISS since October 2016. He was repeatedly treated by surgery for a L3 plasmacytoma, last surgical intervention in October 2018, with multiple relapses and evolution to extramedullary plasmacytomas, including a medullary transplant. The initial therapy conducted was 2 cycles of VAD and 5 cycles of Bortezomib-Doxorubicin Liposomal-Dexamethasone, followed by relapses and autologous transplant. In September 2018 an FDG PET/Ct was performed who showed multiple bone metastasis, inguinal lymphadenopathies and muscular lesions in the anterior compartment of left thigh. Considering the progressive disease, the therapy was changed with Carfilzomib and Dexamethasone and after 5 cycles another FDG PET/CT was performed showing a significant progressive disease and new muscular lesions, cutaneous and lymphadenopathies with very high FDG uptake. The evolution under the treatment was considered very aggressive so we rise the question of new neoplastic pathology associated with multiple myeloma (cutaneous and muscular metastasis from another primary- melanoma/basocellular carcinoma already known?). We mention that after the FDG PET/CT exam the patient was refer for muscular biopsy and histopathological confirmation.

Conclusion: Despite of the convencional morfological imaging, FDG PET/CT examination is able to identify the asociation of an aggressive component in the course of multiple myeloma, the changing in the activity profile by making new cellular clones with high proliferation index and the posibility of detecting new primaries.

Keywords: multiple myeloma, PET/CT, FDG, plasmacytoma

25.EVALUAREA DOZIMETRICĂ POSTRADIOIODOTERAPIE LA PACIENȚII CU HIPERTIROIDISM

Sabo Alexandrina¹, Moisesescu-Goia Cristina¹, Cekan Iulia¹, Pestean Claudiu^{1,2}, Crișan Monica¹, Olariu Elena¹, Piciu Doina^{1,2}

¹*Institutul Oncologic “Prof.Dr. Ion Chiricuță” Cluj-Napoca*

²*Universitatea de Medicină și Farmacie “Iuliu Hațieganu” Cluj-Napoca*

Introducere: I-131 este un izotop radioactiv, cu un timp de înjumătățire de 8,04 zile, cu dezintegrare prin emisia de radiații γ cu energia 364keV și β cu energia 606keV. Tratatamentul cu I-131 este utilizat pentru tratarea hipertiroidismului.

Metode: Studiul efectuat în departamentul de Medicină Nucleară al Institutului Oncologic “Prof Dr. Ion Chiricuța” Cluj pe o perioada de 18 luni pe un lot de 21 pacienți (17 femei și 4barbați) cu vârsta medie de 48,3 ani. Înainte de a efectua tratamentul cu I-131pacienții au fost evaluați prin analize de sânge, ecografie tiroidiană, uptake și scintigrafie tiroidiană cu Tc-99m Pt, cu oprirea medicației antitiroidine cu 5-7 zile înainte. Activitatea medie administată a fost de 236,8 MBq cu o doză minimă de 181,3 MBq și o doză maximă de 228,66MBq. S-au făcut măsuratori ale debitului pacienților la distanța de 1m la interval de 2h, 22h și 72h. Fiecare pacient a pus toate obiectele personale utilizate pe perioada spitalizării in câte un sac de plastic și s-au efectuat măsurători ale debitului la peretele sacului. Radioiodoterapia s-a administrat oral, in capsule, iar valoarea debitului s-a măsurat cu un radiodebitmetru Indirad.

Rezultate: Debitului măsurat, la distanta de 1m, la interval de 2h, 22h si 72h a avut o medie de 12.35 $\mu\text{Sv/h}$ (SD $\pm$ 2,63), 8.69 $\mu\text{Sv/h}$ (SD $\pm$ 1,64) respective 7.21 $\mu\text{Sv/h}$ (SD $\pm$ 1,14), cu o pondere de 70% sub valoarea de 10 $\mu\text{Sv/h}$ la 2 ore. Valoarea medie a debitului măsurată la obiectele pacienților în toate cele 3 măsurători a fost 0,31 $\mu\text{Sv/h}$ (SD $\pm$ 0,076).

Concluzii: Rezultatele evidențiază în cazul terapiei din hipertiroidism, faptul că fixarea iodului este aproape integral la nivel tiroidian, fără eliminare cuantificabilă în saliva și transpirație. Recomandările de radioprotecție legate de deșeurile radioactive ale acestor pacienți, nu vor viza aceste aspecte.

Cuvinte cheie: hipertiroidism, debit măsurat, I-131

26.THE ROLE OF 99mTc-TEKTROTYDE SOMATOSTATIN RECEPTOR IMAGING IN THE MEDULLARY THYROID CARCINOMA PROGRESSION

Stolniceanu CR^{1,2}, Ungureanu CM⁵, Preda C⁵, Statescu AM²,

Gutu M^{1,2}, Ionescu TM², Matovic M^{3,4} Stefanescu C^{1,2}

¹*Nuclear Medicine, Biophysics and Medical Physics Department, “Grigore T. Popa University of Medicine and Pharmacy, Iasi, Romania*

²*Nuclear Medicine Clinic, “St. Spiridon” Hospital, Iasi, Romania*

³*Clinical Center Kragujevac, Center for Nuclear Medicine, Serbia*

⁴*Faculty of Medical Sciences, University of Kragujevac, Serbia*

⁵*Endocrinology Clinic, “St. Spiridon” Hospital, Iasi, Romania*

Background: Medullary thyroid carcinoma (MTC), originating from calcitonin (CT)-producing parafollicular C cells, is a rare form of thyroid cancer and it exhibits more aggressive behaviors. Somatostatin receptor subtypes 2, 3 and 5, expression, has been reported in up to 85% of MTCs. Targeting the MTC with 99mTc-Tektrotyde, using somatostatin analogs as a ligand, seems to show pathological uptakes in MTC patients. The aim of this study was to evaluate MTCs progression by analyzing the imaging data of patients with MTC.

Material & method: We studied, over a 12-month period, 10 patients, mean age 39 years (range: 17-72), histologically proven MTC, from 2 nuclear medicine centers (Clinical Center Kragujevac, Serbia and Department of Nuclear Medicine,

University Emergency Hospital Sf. Spiridon Iasi, Romania). Three patients had biochemical evidence of disease (high calcitonin values), three had stable macroscopic disease, one stable disease and 3 recurrent/progressive disease. Each patient received a 10.57 MBq/kg bw 99mTc Tektrotyd dose. Study design: Early dynamic (60 images, 1 image/second, 128x128 matrix, Zoom 1) acquisition, static (10 minutes/image, 256x256 matrix, Zoom 1), whole body (WB) and SPECT images were acquired at 10 minutes, 2, 4 and 24 hours. Uptake was quantified (counts/pixel) in order to assess quantitatively SRS images for the pathological uptakes and regions of interest (ROI) for each hot pathological area were defined.

Results: We quantified 68 pathological uptakes (PU), variable grades Krenning G1-4. 29.4% PU (n=20) were G4, 28% PU (n= 19) G3, 32.35% PU (n= 22) G2 and 6 (8.8 %) G1. From whole group of MTC patients, 11.7% PU (n= 8) were G3 abdominal uptake, 80.88% PU (n=55) G3-4 cervicothoracic uptake and a single G1 lung uptake.

Conclusion: SRS imaging are predictors of disease progression. Persistent biochemical evidence of MTC correlated with tumoral markers elevations and SRS pathological images predict disease progression.

Keyword: medullary thyroid carcinoma, 99mTc-Tektrotyde

27.IMAGINEA ANULUI 2018 ÎN MEDICINA NUCLEARĂ

RC Ciobanca, G Cobzac, C Sfrângeu, GL Andrieș.

Laboratorul De Medicină Nucleară, Spitalul Județean De Urgență, Cluj-Napoca, Cluj, România.

Introducere. Investigarea caracteristicilor populației examinate scintigrafic în România are ca scop consolidarea și inovarea practicii de medicină nucleară prin formarea de ghiduri pentru pacient și atragerea de noi resurse.

Materiale și Metode. Prezentul studiu este epidemiologic descriptiv retrospectiv și utilizează ca bază de lucru registrul de examinări al Laboratorului de Medicină Nucleară pe anul 2018. Prelucrarea datelor a fost posibilă prin intermediul limbajului statistic R și programului RStudio, iar rezultatele prezentate sub formă grafică s-au realizat cu ajutorul pachetului ggplot2.

Rezultate. Cele mai multe examinări au fost necesare pacienților aflați la limitele de vârstă, media fiind de 47,1 ani. Raportul dintre sexe înclină înspre genul feminin într-un quantum de 2:1 și este proporțional cu gradul de urbanizare. Femeile s-au prezentat frecvent datorită cancerului mamar sau afecțiunilor tiroidiene, iar bărbații pentru patologii renale ori adenocarcinom de prostată. Procedurile cel mai des efectuate au fost scintigrafiile osoase, apoi renale și tiroidiene. Limfoscintigrafiile în mare cerere le-au fost indicate mai frecvent persoanelor din medii urbane. Există diferențe în ponderea scintigrafiilor în funcție de tipul localității de proveniență. Examinările SPECT/CT au fost necesare la 1 din 7 pacienți, majoritar pentru limfoscintigrafii și scintigrafii paratiroidiene. În 75% din scintigrafii renale dinamice este necesar furosemid. Femeilor li s-au efectuat mai multe scintigrafii tiroidiene, paratiroidiene și limfoscintigrafii decât bărbaților, cărora le-au fost indicate mai multe scintigrafii renale.

Concluzii. Heterogenitatea practicii de medicină nucleară se oglindește în profilul de activitate al laboratorului, caracterizat de ponderea crescută a scintigrafiilor renale. Pentru definirea statutului medicinei nucleare este esențială caracterizarea populației investigată, de a cărei dinamică trebuie ținut cont în pregătirea specialiștilor și orientarea resurselor disponibile pentru uz optim.

Cuvinte-Cheie: Statistică, Medicină Nucleară, Scintigrafie, Demografie.

THE IMAGE OF 2018 IN NUCLEAR MEDICINE

RC Ciobanca, G Cobzac, C Sfrângeu, GL Andries.

Nuclear Medicine Laboratory, Emergency County Hospital, Cluj-Napoca, Cluj, Romania.

Introduction. Investigating the characteristics of the scintigraphically examined population in Romania aims to consolidate and innovate the practice of nuclear medicine by forming patient guidelines and attracting new resources.

Materials and Methods. The present retrospective descriptive epidemiological study uses the 2018 Nuclear Medicine Laboratory's examination register as basis for work. Data processing was made possible through R statistical language and RStudio program. The graphically presented results were made with the help of ggplot2 package.

Results. The most examinations were required for patients having extreme ages, averaging 47.1 years. The gender ratio is tilted towards females in a 2:1 ratio and is proportional to the degree of urbanization. Women were frequently sent for breast

cancer or thyroid disease, while men for kidney pathologies or prostate adenocarcinoma. The most frequently performed procedures were bone, then renal and thyroid scintigraphies. Lymphoscintigraphies in high demand have been more commonly indicated to patients from urban environments. There were differences in the percentage of procedures depending on the type of the place of origin. SPECT/CT examinations were carried out in 1 out of 7 patients, in majority for parathyroid and lymphoscintigraphy patients. 75% of dynamic renal scintigraphies require furosemide. Women were indicated more thyroid, parathyroid and lymphoscintigraphic scans than for men, for which the most were renal scintigraphies.

Conclusions. The heterogeneity of nuclear medicine practice is mirrored in the laboratory's activity profile, characterized by an increased share of renal scintigraphies. In defining the status of nuclear medicine, it is essential to characterize the investigated population, the dynamics of which must be considered when training specialists and orienting the available resources for optimal use.

Key Words: Statistics, Nuclear Medicine, Scintigraphy, Demography.

28.ARTEFACTELE: O PARTE ESENTIALA IN VIATA UNUI MEDIC DE MEDICINA NUCLEARA

AC Țârcă¹, TM Ionescu¹, CR Stolniceanu^{1,2}, AM Stătescu¹, IC Grierosu^{1,2}, MM Guțu^{1,2}, C Ștefănescu^{1,2}

¹*Nuclear Medicine Laboratory, County Emergency Hospital „Sf. Spiridon” Iasi, Romania*

²*University of Medicine and Pharmacy U.M.F „Grigore T. Popa” Iasi, Romania*

Context: Medicina nucleară este o examinare imagistica de diagnostic care studiaza distributia unui radioizotop legat de o molecula vector cu o anumita specificitate tisulara. Prezenta artefactelor ar putea conduce la dificultati la interpretarea scintigramei. Sursele artefactelor sunt numeroase, de exemplu, pacientul, tehnica, procedura, radiofarmaceuticul, extravazarea traserului si multe altele. Scopul acestei lucrari este de a prezenta cateva cazuri de artefacte din arhiva laboratorului nostru de medicina nucleara, pentru a evita in viitor aceste situatii.

Material si metoda: Va prezentam cateva cazuri de artefacte din arhiva noastra din ultimii 4 ani. Le-am selectat pe cele mai interesante si reprezentative, pentru a avea o perspectiva mai exhaustiva in detectarea si rezolvarea acestor situatii.

Rezultate: Artefactele intalnite sunt in principal legate de scintigramele osoase si renale, dar pot fi gasite si in alte tipuri de explorari. Imaginile aditionale au rezolvat problema, la fel ca si alte solutii, daca impedimentul e persistat.

Discutii: Artefactele pot aparea din diferite surse, de aceea este de o importanta capital sa le recunoastem. Cum complexitatea echipamentulu de imagistica se mareste, si pletora de artefacte este in crestere. O buna intelegere a instrumentarului si a radiofarmaceuticului este esentiala pentru recunoasterea si corectarea artefactelor. Majoritatea acestora pot fi rezolvate prin imagini aditionale sau prin adaptarea protocolului imagistic. De asemenea, corelatia cu alte tehnici imagistice pot furniza medicului informatii vitale pentru un diagnostic exact.

Concluzii: Artefactele pot conduce la diagnostic gresite si astfel procedurile premargatoare acestuia pot fi influentate decisive. Similar altor tehnici imagistice, artefactele din medicina nucleara pot fi rezolvate prin imagini suplimentare, pentru o mai buna intelegere a originii si localizarii acestora, cu scopul unei abordari medicale personalizate.

Cuvinte cheie: artefacte, medicina nucleara, diagnostic

ARTEFACTS: AN ESSENTIAL PART OF A NUCLEAR MEDICINE PHYSICIAN LIFE

AC Țârcă¹, TM Ionescu¹, CR Stolniceanu^{1,2}, AM Stătescu¹, IC Grierosu^{1,2}, MM Guțu^{1,2}, C Ștefănescu^{1,2}

¹*Nuclear Medicine Laboratory, County Emergency Hospital „Sf. Spiridon” Iasi, Romania*

²*University of Medicine and Pharmacy U.M.F „Grigore T. Popa” Iasi, Romania*

Background: Nuclear medicine is a diagnostic imaging examination that studies the distribution of a radioisotope bound to a vector molecule that has a certain tisular specificity. The presence of artefacts could lead to difficulties in scintigram interpretation. Artefacts sources are numerous, for instance the patient, technique, procedure, radiopharmaceutical, tracer extravasation and many others. The aim of this paper is to present a few cases of artefacts from our nuclear medicine laboratory archive in order to avoid these situations in the future.

Material and Method: We present a few cases of artefacts from our archive from the last 4 years. We selected the most interesting and representative cases in order to offer a more comprehensive aspect in detecting and ultimately solving this type of situation.

Results: The artefacts we encountered are mostly related to renal and bone scans, but there were also artefacts detected on others types of scintigraphys. Additional imaging resolved the issue, so did different solutions, if the problem persisted.

Discussions: Artefacts can arise from many sources and therefore it is of utmost importance to recognize them. As the complexity of scintigraphic imaging equipment increases, so does the number and types of artifacts. A clear understanding of instrumentation and radiopharmaceuticals is essential for recognition and correction of imaging artefacts. Many artefacts can be solved by means of additional imaging or by adapting the imaging protocol. Furthermore, correlation with other imaging techniques can provide the nuclear medicine physician with information that can lead to a more accurate diagnosis.

Conclusions: Artifacts may lead to miss diagnoses and therefore diagnostic and therapeutic procedures may be influenced decisively. Nuclear medicine artifacts, like all imaging techniques, are resolved by additional imaging in order to better asses the location and origin of the artefact for a personalized management approach.

Key words: artefacts, nuclear medicine, diagnose

29.ROLUL DIAGNOSTIC AL IMAGISTICII FUNCȚIONALE PENTRU O FORMAȚIUNE SOLITARĂ ADRENALĂ ASOCIATĂ CANCERULUI DE SÂN – PREZENTARE DE CAZ

Laura Teodoriu¹, Roxana Iacob¹, Bianca Ioan², Ana-Maria Stătescu³, Irena Grierosu^{1,3}, Mihai Guțu^{1,3}, Cristina Preda^{1,2}, Cipriana Ștefănescu^{1,3}

¹Universitatea de Medicină și Farmacie “Gr. T Popa” din Iași, România

²Clinica de Endocrinologie, Spitalul Universitar “Sf. Spiridon”, Iași, România

³Laboratorul de Medicină Nucleară, Spitalul Universitar “Sf. Spiridon”, Iași, România

Introducere: Carcinomul ductal invaziv (CDI) este una din cele mai frecvente cauze ale neoplaziilor sânului, cu un procentaj de aproximativ 85% din totalul acestora. Leziunile secundare frecvent întâlnite sunt localizate: pulmonar, hepatic, cerebral și osos. Metastazele solitare adrenale secundare carcinomului de sân sunt extrem de rare. A fost studiat pattern-ul metastatic al cancerului de sân, iar în acel lot de paciente nu s-a găsit nicio metastază solitară adrenală. Scopul nostru este de a prezenta cazul unei paciente cu CDI și leziune solitară adrenală.

Material și pacienți: Prezentăm cazul unei paciente în vârstă de 72 ani ce a fost diagnosticată cu carcinom ductal invaziv, netratat (G1, scor Nottingham 4). Pacienta a fost supusă investigațiilor de rutină (CT toraco-abdominal) privind excluderea leziunilor secundare, astfel rezultatul imagistic a decelat prezența unor noduli tiroidieni și o formațiune nodulară suprarenaliană stângă cu wash-out și unități Hounsfield sugestive pentru malignitate. În aceste condiții pacienta a fost internată în Clinica de Endocrinologie Iași unde s-a efectuat bilanțul hormonal suprarenalian și s-au continuat investigațiile nodulilor tiroidieni. Rezultatul bilanțului hormonal a fost normal: Cortizol seric, cortizol liber urinar, ACTH, Serotonină, 5 HIA, metanefrine urinare, în acest fel excluzându-se caracterul secretor al formațiunii nodulare suprarenaliene. Pentru evaluarea nodulilor tiroidieni s-a efectuat puncție aspirație cu ac fin având caractere de benignitate. Acest rezultat coroborat cu rezultatele negative ale Calcitoninei și PTH au exclus o neoplazie endocrină multiplă. Pentru a confirma aceeași apartenență a carcinomului ductal invaziv cu formațiunea adrenală, am efectuat scintigramă ^{99m}Tc – MIBI scanare corp întreg ce a arătat fixarea MIBI în cele două formațiuni.

Concluzii: Raportăm cazul rar al unei formațiuni unice adrenale asociate carcinomului ductal invaziv în care scintigrama MIBI corp întreg ne poate confirma supoziția originii tumorale pentru cele două formațiuni, urmând a avea diagnosticul histopatologic de certitudine.

Cuvinte cheie: carcinom de sân, formațiune suprarenaliană, ^{99m}Tc – MIBI scanare corp întreg

FUNCTIONAL IMAGING AS A DIAGNOSTIC TOOL FOR SOLITARY ADRENAL MASS AND BREAST CARCINOMA

CASE REPORT

Laura Teodoriu¹, Roxana Iacob¹, Bianca Ioan², Ana-Maria Statescu³, Irena Grierosu^{2,3}, Mihai Gutu^{2,3}, Cristina Preda^{1,2}, Cipriana Stefanescu^{2,3}

¹*”Grigore T. Popa” University of Medicine and Pharmacy, Iași, Romania*

²*Department of Endocrinology, “Sf. Spiridon” Emergency University Hospital, Iași, Romania*

³*Laboratory of Nuclear Medicine, “Sf. Spiridon” Emergency University Hospital, Iași, Romania*

Introduction: Invasive ductal carcinoma (IDC) is the most common histological type of breast cancer, accounted for up to 85% of all invasive breast carcinomas. The common areas of solitary metastasis are lung, liver, brain and bone. Isolated adrenal metastases are rare in this type of carcinomas, especially when they originate from IDCs. Metastatic patterns of breast cancer were reported and no one in that study had adrenal metastasis. Our aim is to present a case report of a patient with IDC and adrenal solitary mass.

Material and patient: We report a case of a 72 year – old women with 6 year history of non-treated IDC (G1 Nottingham 4). The patient performed thoracic and abdominal computer tomography to exclude secondary lesions. Imaging results revealed heterogeneous thyroid structure with nodules and a left solitary adrenal mass (31 mm) with wash-out and Hounsfield units suggestive for malignancy. Due to the presence of thyroid nodules and left adrenal mass, she was admitted to the Endocrinology department for further investigations. Hormonal tests were normal: Cortisol (serum and urinary), ACTH, Serotonin, 5HIA, metanephrines (urinary), thus excluding secretory adrenal mass. Also normal results of thyroid fine needle aspiration biopsy and Calcitonin, PTH, excluded multiple endocrine neoplasia. To confirm the association between breast carcinoma and adrenal mass we performed 99m Tc – MIBI whole body scan which revealed that both formations uptake the radiotracer.

Conclusion: This is a report of a rare solitary adrenal mass associated with breast carcinoma. Given the rarity of solitary adrenal metastasis, the recommended treatment is still unclear, and must be personalized. Functional imaging supports our strong supposition in this particular case that solitary adrenal mass could be secondary to breast carcinoma, going to have further histological confirmation.

Key words: breast carcinoma, adrenal mass, 99m Tc – MIBI whole body scan

TEACHING FILES

30.ASPECT FALS POZITIV DE DETERMINĂRI SECUNDARE OSOASE ÎNTR-UN CAZ DE GLUCAGONOM PANCREATIC. PREZENTARE DE CAZ

M. G. Alexa, Irina Maria Strugari, Mirela Gherghe

Secția Medicină Nucleară, Institutul Oncologic „Prof. Dr. Alexandru Trestioreanu”, București, România

Introducere: Glucagonomul este o tumoră rară a celulelor alfa pancreatice ce are drept rezultat producția excesivă de glucagon, caracterizată prin hiperglicemie prin gluconeogeneză și lipoliză, iar clinic prin eritem necrolitic tranzitor, prezent la 70% dintre pacienți, și diabet zaharat în aproximativ 80% din cazuri, cauzat de dezechilibrul dintre insulină și glucagon.

Prezentare de caz: Pacient în vârstă de 46 de ani, diagnosticat cu tumoră neuroendocrină caudală pancreatică secretantă de glucagon G1. Din antecedentele personale se cunosc: diabet zaharat insulinodependent de 2 ani, tromboză venoasă profundă ileo-femuro-poplitee stângă, psoriazis pustulos diseminat, în tratament cu metilprednisolon, osteoporoză severă cu tasări vertebrale, fracturi costale, fractură trohanteriană stângă, indusă prin tratamentul glucocorticoid, hipoalbuminemie și eritem necrolitic migrator tranzitor sub tratament cu analogi de somatostatine.

Management și rezultate: În urma examenului CT, se descrie o formațiune tumorală solidă net conturată, de 3,5/4,4 cm, la nivelul regiunii caudale pancreatice, cu noduli solizi sateliți. Scintigrafia osoasă whole-body a ridicat suspiciunea de determinări secundare osoase (vertebrale, costale, scapulare drepte, femurale stângi). Prin testele imunohistochimice și prin aspectul citologic, se susține diagnosticul de proliferare neuroendocrină bine diferențiată, G1, Ki67 pozitiv 2%. Examinarea PET/CT cu F18-FDG relevă o activitate metabolică intensă, atipică, pentru o tumoră neuroendocrină bine diferențiată G1, fără determinări secundare metabolice active la distanță.

Discuții și concluzii: Cazul prezentat remarcă un exemplu de rezultat fals pozitiv al determinărilor secundare ale unui glucagonom în cadrul examinării scintigrafice osoase, în lipsa unui istoric amănunțit și a unei examinări SPECT/CT, precum și aviditatea crescută pentru F18-FDG, atipică pentru o tumoră NET G1.

Cuvinte cheie: glucagonom, scintigrafie, PET/CT, fals pozitiv.

FALSE POSITIVE RESULT OF BONE METASTASES IN A CASE OF PANCREATIC GLUCAGONOMA. CASE PRESENTATION

M. G. Alexa, Irina Maria Strugari, Mirela Gherghe

Department of Nuclear Medicine, Institute of Oncology "Prof. Dr. Alexandru Trestioreanu ", Bucharest, Romania

Introduction: Glucagonoma is a rare tumor of pancreatic alpha cells, resulting in excessive glucagon production characterized by hyperglycemia through gluconeogenesis and lipolysis, and clinically by transient necrolytic erythema present in 70% of patients and diabetes in approximately 80% of cases, caused by the imbalance between insulin and glucagon.

Case presentation: 46-year-old patient diagnosed with G1 glucagon-secreting pancreatic caudal neuroendocrine tumor. Personal history: two-year insulin-dependent diabetes mellitus, deep left ileo-femoral-popliteal venous thrombosis, disseminated pustular psoriasis in treatment with methylprednisolone, severe osteoporosis with spinal cord compressions, croup fractures, left trochanteric lesion induced by glucocorticoid treatment, hypoalbuminemia and transient migratory necrolytic erythema under somatostatin analog therapy.

Management and Results: Following the CT examination, a net contoured solid tumor formation of 3.5/4.4 cm is described in the pancreatic caudal region with solid satellite nodules. Whole-body bone scintigraphy has raised the suspicion of bone secondary determinations (vertebral, cranial, right scapula, left femur). Immunohistochemical and cytological assays support the diagnosis of well differentiated neuroendocrine proliferation, G1, Ki67 positive 2%. PET/CT examination with F18-FDG reveals an atypical intense metabolic activity for a well-differentiated G1 neuroendocrine tumor with no active metabolic metastases.

Discussion and conclusion: The case presents an example of false positive bone scintigraphic result of glucagonoma metastasis, in the absence of a detailed history and a SPECT/CT examination, as well as the increased avidity for F18-FDG, atypical for a NET G1 tumor.

Key words: glucagonoma, scintigraphy, PET/CT, false positive

31. DIAGNOSTICUL DIFERENȚIAL ȘI STABILIREA CONDUITEI TERAPEUTICE PENTRU O TUMORĂ OSOASĂ SCAPULARĂ SUPRASPINOASĂ PRIN SCINTIGRAFIA OSOASĂ ÎN TREI FAZE VERSUS ALTE TEHNICI IMAGISTICE

M. Dragoteanu¹, Cecilia Pîgleșan¹, Ioana Duca²

¹*Institutul Regional de Gastroenterologie-Hepatologie” Prof. Dr. Octavian Fodor”, Cluj-Napoca*

²*Clinica Medicală II, Cluj-Napoca*

Pacient 41 ani, diagnostic clinic, Rx, CT, ecografie de părți moi: tumoră malignă supra-spinoasă a omoplatului stâng. Fără fenomene locale celsiene evidente.

RADIOGRAFIE: Tumoră scapulară supraspinoasă, zone de distrucție osoasă, deformări ale corticalei; aspect de sarcom osos, puțin probabil metastaza unică, exclude osteomieliță.

ECOGRAFIA de părți moi: Distrucție extinsă a corticalei osoase, întreruperi periostale, aspect tumoral (sarcom?). RMN: Colecție intraarticulară scapulo-humerală importantă (abces?). Aspect inflamator al musculaturii periarticulare. CT: Aspect de tumoră condromatoasă scapulară primitivă malignă.

REPETARE RADIOGRAFIE: Zonă osteolitică imprecis delimitată, interesând procesul coracoid, posibil sechestrul osos. Nu poate diferenția abces / proces malign, eventual suprainfectat.

SCINTIGRAFIA OSOASĂ ”în TREI FAZE”: 1. Faza dinamică precoce: Hiperperfuzie intensă supraspinoasă stângă. Aspect tipic de osteomieliță. 2. Scintigrafia statică imediată: Fixare intensă supraspinoasă. Susține diagnosticul de osteomieliță, nu exclude tumoră malignă suprainfectată. 3. Scintigrafia statică tardivă segmentală și de corp întreg, 3h postinjectare: Hiperfixarea locală supraspinoasă, fără alte zone focale hipercaptante. Nu tranșează diagnosticul diferențial tumoră malignă / osteomieliță.

CONDUITA TERAPEUTICĂ: Pacientul refuză propunerea ortopedului de amputare a brațului și centurii scapulo-humerală. Biopsie osoasă chirurgicală din zona supraspinoasă, examen morfopatologic, însămânțare pe medii de cultură. Intraoperator: aspect osos tumoral. Externare, tratament ambulatorial două săptămâni cefalosporine + ciprofloxacină.

REZULTATE LABORATOR: Confirmarea infecției stafilococice. Examen histopatologic: fără caractere de malignitate. Antibioterapie prelungită 2 luni; dispariție totală a simptomatologiei.

CONCLUZIE: Scintigrafia osoasă în trei faze este foarte performantă în evaluarea diferențiată a imaginilor segmentale și corp întreg. Diagnosticul de tumoră osoasă primitivă malignă pus exclusiv prin tehnici imagistice morfologice este riscant.

Cuvint cheie: Scintigrafie osoasă, sarcom, metastază osoasă, osteomieliță, diagnostic diferențial imagistic

32. TUMORI PRIMARE ASOCIATE CANCERULUI TIROIDIAN

K. Gabora^{1,2}, B. Grădinaru², E. Spînu², G. Rusu², L. Hîțu², A. Alexiev², H. Haba², G. Kermoison², E. Olariu^{1,2}, A. Piciu^{1,2}, D. Piciu^{1,2}

¹*Universitatea de Medicină și Farmacie ”Iuliu Hațieganu” Cluj Napoca*

²*Institutul Oncologic ”Prof. Dr. Ion Chiricuță” Cluj Napoca*

Introducere: Incidența patologiilor neoplazice este în creștere continuă, fiind legată de expunerea individului la factori de risc predispozanți, existența unei condiționări genetice, vârsta, sexul etc. Cancerul tiroidian este cea mai frecventă patologie neoplazică endocrină al cărei tratament presupune cel mai frecvent chirurgie și radioiodoterapie. Apariția unui proces malign asociat cu neoplazia tiroidiană nu este o raritate. Rata apariției unei neoplasme asociate cu cancerul de tiroidă raportat în literatură este de 13,1% pentru sexul masculin și de 13,7% pentru sexul feminin.

Metode: Studiul actual s-a desfășurat în Institutului Oncologic ”Prof. Dr. Ion Chiricuță”, Cluj-Napoca. S-au luat în evidență pacienți cu neoplazii primare asociate cancerului tiroidian care s-au prezentat la control oncologic în perioada noiembrie 2016 - aprilie 2017. S-a efectuat un studiu retrospectiv în care au fost incluși pacienți diagnosticați cu cancer tiroidian, la care s-a asociat o altă tumoră primară.

Rezultate: Au fost incluși în studiu 50 de pacienți cu cancer tiroidian și alte neoplasme primare asociate. S-au identificat 16 cazuri de cancer mamar (32%), 12 cazuri de melanom (24%), 13 cazuri de cancer colorectal (26%), 9 cazuri de neoplasm bronho-pulmonar (18%). Majoritatea cazurilor au fost de sex feminin, tipul de asociere cel mai frecvent a fost de tip metacron

cu un procentaj de 77% față de cel sincron 23%. O singură pacientă a fost identificată cu trei cancere primare asociate, respectiv neoplasm tiroidian, colo-rectal și melanom, la care s-a testat mutația BRAF V600E din toate tipurile de tumoră.

Concluzii: Sunt puține studii care abordează tema cancerelor primare asociate, deși ele sunt importante atât din punct de vedere a evaluării, supravegherii cât și a conduitei terapeutice la acești pacienți.

Cuvinte cheie: glanda tiroidă, cancer tiroidian, neoplasme asociate

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PRIMARY TUMORS ASSOCIATED WITH THYROID CANCER

K. Gabora^{1,2}, B. Grădinaru², E. Spînu², G. Rusu², L. Hițu², A. Alexiev², H. Haba², G. Kermoison², E. Olariu^{1,2}, A. Piciu^{1,2}, D. Piciu^{1,2}

¹University of Medicine and Pharmacy "Iuliu Hațieganu" Cluj Napoca

²Institute of Oncology "Prof. Dr. Ion Chiricuță" Cluj Napoca

Introduction: The incidence of cancer is steadily increasing worldwide, being related to the exposure of the individual to predisposing risk factors, the existence of genetic conditioning, age, gender, etc. Thyroid cancer is the most common endocrine cancer whose treatment involves usually surgery and radioiodine therapy. The occurrence of a malignant process associated with thyroid cancer is not a rarity. The rate of occurrence of a primary neoplasm associated with thyroid cancer reported in the literature is 13.1% for males and 13.7% for females.

Methods: The present study was conducted at the Institute of Oncology "Prof. Dr. Ion Chiricuță", Cluj-Napoca. We conducted a retrospective study to identify patients with thyroid cancer and an associated primary malignancy. We included in our study patients who underwent oncological control during November 2016 - April 2017 in our department for thyroid cancer, who in association presented another primary malignant tumor.

Results: 50 patients with thyroid cancer and other associated primary neoplasms were enrolled in this study. We identified 16 cases of breast cancer (32%), 12 cases of melanoma (24%), 13 cases of colorectal cancer (26%), 9 cases of bronchopulmonary neoplasm (18%). Most cases were female, the most common type of association was metachronous with 77% of the cases, while 23% were synchronous. One patient was identified with three associated primary cancers, in particular, thyroid cancer, colorectal cancer and melanoma, the BRAF V600E mutation was tested in all tumor types.

Conclusions: There are few studies addressing the issue of associated primary malignancies, although they are important both in terms of evaluation, supervision and treatment in these patients.

Key words: thyroid gland, thyroid cancer, associated primary tumors

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33. STRUCTURAL AND FUNCTIONAL IMAGING ASPECTS OF NEUROENDOCRINE CARCINOMA OF THE CERVIX : A CASE REPORT

Wael Jalloul¹, Ruxandra Tibu¹, Ana-Maria Statescu¹, Cipriana Ștefănescu^{1,2}

¹ Nuclear Medicine Laboratory, County Emergency Hospital „Sf. Spiridon” Iasi, Romania

² University of Medicine and Pharmacy U.M.F „Grigore T. Popa” Iasi, Romania

Background and Aim: Neuroendocrine carcinoma of the cervix (NECC) is an aggressive histological variant accounting for about 1–1.5% of all cervical cancers. Small cell carcinomas (NEC) is the most common type of NECC. It is more likely to invade the lymphovascular space and to spread to the regional lymph node basin at the time of diagnosis.

The purpose of our study was to describe the imaging aspects in a case of NECC and to look for a theranostic approach to treat it.

Materials and Methods: We present the case of 70-year-old woman diagnosed with NECC (small cell NEC). After uterine curettage and electrical conization, followed by chemotherapy, she was sent for a ^{99m}Tc-HDP bone scan in order to obtain further informations about the nature of a lesion described on a follow up MRI on the left ischium and to look for other possible bone metastasis.

Results and Discussions:

-Anatomopathological exam: a neuroendocrine cervical small cell carcinoma (poorly differentiated).

-Immunohistochemical exam: positive Chromogranin A, Synaptophysin and Ki67.

-Abdominal and pelvic MRI: the exact topography and extension of the neoplasia. Four metastatic sites were discovered in the liver and one nodular lesion at the base of the right lung.

-Thoracic CT scan: a pulmonary nodule on the right lung.

-A follow up MRI (6 months after the first MRI): a possible metastatic lesion on the left ischium. No other aspects of active disease were discovered.

-^{99m}Tc-HDP bone scan: A high uptake on the left ischium (corresponding to the MRI description) and an other one on the mid shaft of the tibia, which could have a metastatic etiology.

The theranostic approach with the use of somatostatin analogues was not possible in this case because of the high value of Ki67 (40-50%).

Conclusion: MRI, CT and ^{99m}Tc-HDP bone scan are essential tools in the pre and post-therapeutic assessment of NECC for local staging and to determine the extent of nodal and metastatic spread.

In our case, the patient has simultaneously liver, lung and bone metastasis which is rarely described.

Key words: Neuroendocrine carcinoma of the cervix, ^{99m}Tc-HDP bone scan, metastasis.

34. ¹⁸F-FDG PET/CT UNUSUAL UPTAKE IN CUTANEOUS METASTASIS DEBUT LUNG CANCER

Polixenia-Laura Grecu², Daniela Chețan¹, Roxana Iacob³, Ș. Bîlha¹, Cipriana Ștefănescu^{2,3}, A.G. Naum^{1,3}

¹Nuclear Medicine Laboratory, Regional Institute of Oncology Iasi, Romania

²Nuclear Medicine Laboratory, County Emergency Hospital „Sf. Spiridon” Iasi, Romania

³University of Medicine and Pharmacy U.M.F „Grigore T. Popa” Iasi, Romania

Background. Lung cancer is still considered the biggest cancer killer in Europe with more than 410,000 people diagnosed every year and with the highest mortality rate among all cancers. Epidermal growth factor receptor (EGFR) mutation status is the most valuable indicator for the screening of pulmonary adenocarcinoma patients. Patients who are EGFR negative have poor prognoses compared to those with the EGRF mutation since they don't have a specific inhibitor to be the first line of treatment; additionally, patients diagnosed directly with cutaneous metastasis adds a worse prognosis. Methods. We present the case of a 65-year-old man diagnosed with EGFR negative lung adenocarcinoma randomly discovered after investigating some cutaneous nodules that have been found to be metastases. ¹⁸F fluorodeoxyglucose-positron emission tomography (¹⁸F-FDG PET/CT) has been perform to evaluate the therapeutic response.

Results. Multiple areas of hypermetabolism have been discovered at the level of anterior segment of LSL, mediastinal adenopathies, upper right frenal adenopathy, masses over both adrenal glands, infrarenal right adenopathic block which extends to the spine without invading it, getting down to the right iliac crest and in the muscle of the neck, upper anterior wall of the left hemitorax and left thigh also osteolysis in the T6, T8 vertebral bodies and L1 osteocondensation with a high probability to be metastasis.

Discussions. The patient had progressive disease under chemotherapy, subsequently undergoing immune therapy with stationary state which strengthens the importance of targeted treatment and of ¹⁸F-FDG PET/CT scan to evaluate the therapeutic response. **Conclusion.** Stage IV lung cancer portends an extremely poor prognosis. Standardized uptake value (SUV) measured by ¹⁸F-FDG PET/CT associate with tumor aggressiveness can provide additional prognostic information and it's crucial for the evaluation of the therapeutic response.

Key words: lung cancer, EGFR mutation, cutaneous metastasis, PET/CT.

RO: ¹⁸F-FDG PET/CT UNUSUAL UPTAKE IN CUTANEOUS METASTASIS DEBUT LUNG CANCER

Background. Cancerul pulmonar este considerat cel mai mare ucigaș din Europa, cu peste 410.000 de persoane diagnosticate în fiecare an și cu cea mai mare rată a mortalității din rândul tuturor cancerelor. Mutația EGFR(epidermal growth factor receptor) este cel mai valoros indicator pentru screening-ul pacienților cu adenocarcinom pulmonar. Pacienții ce nu prezintă mutația EGFR au un prognostic mai slab în comparație cu cei ce prezintă mutația, deoarece nu există un inhibitor specific pentru a fi prima linie de tratament; în plus, pacienții diagnosticați direct cu metastaze cutanate au un prognostic și mai prost. Methods. Prezentăm cazul unui bărbat în vârstă de 65 de ani diagnosticat cu adenocarcinom pulmonar negativ la mutația EGFR, descoperit întâmplător după investigarea unor noduli cutanați care s-au dovedit a fi metastaze. A fost efectuată o examinare PET/CT (positron emission tomography) pentru a evalua răspunsul terapeutic. Results. Au fost descoperite zone multiple de hipermetabolism glucidic la nivelul segmentului anterior al LSS, adenopatii mediastinale, adenopatie frenică superioară dreaptă, formațiuni cu hipermetabolism patologic intens deasupra ambelor glande suprarenale, bloc adenopatic infrarenal care se extinde până la nivelul coloanei vertebrale, fără a o invadea, ajungând la creasta iliacă dreaptă, formațiune intens hipermetabolică dezvoltată la nivelul musculaturii peretelui antero-superior al hemitoracelui stâng, hipermetabolism intens pe topografia musculaturii interne a coapsei stângi și osteolize la nivelul corpurilor vertebrale T6, T8 plus osteocondensare L1.

Discușii. Pacientul a suferit o boală progresivă sub chimioterapie, supus ulterior terapiei imune cu stare staționară astfel consolidând importanța tratamentului personalizat și a examinării PET/CT pentru a evalua răspunsul terapeutic.

Concluzii. Stadiul IV a cancerului pulmonar prezintă un prognostic extrem de scăzut. Standardized uptake value (SUV) măsurat în asociere cu date ce țin de agresivitatea tumorii pot furniza informații de prognostic suplimentare și sunt esențiale pentru evaluarea răspunsului terapeutic.

Cuvinte cheie: cancer pulmonar, mutație EGFR, metastază cutanată, PET / CT.

35.DILATAREA ISCHEMICĂ TRANZITORIE DE EFORT A VENTRICULULUI STÂNG: PREZENTARE DE CAZ

I.Muntea³, A. Chirilă^{1,2}, R. Hagi¹, G. Andries^{2,3}

¹*Institutul Inimii „Niculae Stăncioiu” Cluj-Napoca*

²*UMF „Iuliu Hațieganu” Cluj-Napoca*

³*Spitalul Clinic Județean de Urgență Cluj-Napoca*

Dilatarea ischemică tranzitorie de efort este un fenomen indus de prezența ischemiei subendocardice, care generează creșterea în volum a cavității ventriculului stâng pe imaginile post-efort, comparativ cu imaginile de repaus. Aspectul scintigrafic este specific afectării multivasculare sau stenozelor de trunchi principal semnificative hemodinamic. Vă prezentăm cazul unei paciente de 66 ani, diabetică, fără angor, cu antecedente de dublu by-pass aorto-coronarian. Imaginile de gated SPECT relevă dilatare ischemică tranzitorie de efort, cu un indice de dilatare de 1.31, valori normale ale volumelor end-sistolice la efort și repaus, și anomalii semnificative de performanță ventriculară la efort. Imaginile de perfuzie au arătat hipoperfuzie cronică de repaus și ischemie extinsă post-efort. Rezultatele obținute au fost validate prin explorare invazivă: patologie multivasculară, implicarea trunchiului principal al arterei coronare stângi și ocluzie de graft venos. S-a efectuat angioplastie coronariană percutană cu rezultat final bun. Examinarea scintigrafică s-a dovedit utilă în stabilirea eligibilității pentru explorare invazivă și ghidarea terapiei de revascularizare.

Cuvinte cheie: dilatare ischemică tranzitorie de efort, ischemie miocardică, gated SPECT

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LEFT VENTRICULAR TRANSIENT ISCHAEMIC DILATION: A CASE REPORT

I.M. Muntea³, A. Chirilă^{1,2}, R. Hagi¹, G. Andries^{2,3}

¹*The Heart Institute „Niculae Stăncioiu” Cluj-Napoca, ROMANIA*

²*University of Medicine and Pharmacy UMF „Iuliu Hațieganu” Cluj-Napoca, ROMANIA*

³*Department of Nuclear Medicine- Clinical Emergency County Hospital Cluj-Napoca, ROMANIA*

Transient ischaemic dilation (TID) is a phenomenon induced by the presence of extensive subendocardial ischaemia, generating an increase in the left ventricular cavity on the post-exercise images, compared to rest images. The scintigraphic aspect is specific to multivessel disease or main trunk stenosis with hemodynamic significance. We present the case of a 66-year-old female diabetic, no typical chest pain, with a history of double aortic coronary bypass. Gated SPECT revealed transient exercise-induced dilation, with a TID index of 1.31, normal values of end-systolic volumes at stress and rest and

significant abnormalities of ventricular performance at stress. Perfusion images showed rest abnormalities and extensive stress ischaemia. The scintigraphic findings were validated by invasive exploration: multivessel pathology, involvement of left main coronary and venous graft occlusion. Percutaneous coronary intervention (PCI) was performed, with good clinical outcome. Scintigraphic examination is useful in establishing the eligibility for invasive exploration and in guiding the revascularization therapy.

Key words: transient ischaemic dilation, myocardial ischemia, gated SPECT

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36.EXAMINAREA PET/CT CU F18-FDG VERSUS SCINTIGRAFIA RECEPTORILOR DE SOMATOSTATINA IN CAZUL UNEI TUMORI NEUROENDOCRINE ILEALE G2

M. Mutuleanu, Romina Costache, Mirela Gherghe

Institutul Oncologic "Prof. Dr. Al. Trestioreanu", București, România, Secția Medicină Nucleară

Introducere: Tumorile neuroendocrine sunt tumori dezvoltate din celule stem multipotente care migrează din creasta neurală. Aceste tumori se dezvoltă din celulele enterocromafine localizate în țesutul neuroendocrin răspândit în întreg organismul. Clasificarea morfologică a acestora propusă de OMS se face după indicele de proliferare Ki67 în: tumori G1 ($\leq 2\%$ -bine diferențiate), tumori G2 (3-20%-moderat diferențiate) și tumori G3 ($\geq 20\%$ -slab diferențiate). Metoda gold standard de identificare a unei tumori neuroendocrine cu punct de plecare neprecizat este scintigrafia neuroendocrină sau examenul PET/CT cu radiotrasori specifici ce se cuplează de receptorii de somatostatină (Ga68- DOTATATE și 111In-Pentetreotide sau 99mTC- Tektrotyd).

Diagnostic și rezultate: Prezentăm cazul unui pacient cu simptomatologie gastrointestinală nespecifică diagnosticat în urma unei ecografii de rutină cu formațiuni înlocuitoare de spațiu hepatic; examenul biptic efectuat a evidențiat determinări secundare hepatice de carcinom neuroendocrin G2.

Pentru depistarea tumorii primare, nefiind disponibili analogii de somatostatină, se indică examen PET/CT cu F18-FDG care a evidențiat determinarea secundară hepatică, inactivă metabolic la F18-FDG și determinări secundare ganglionare retroperitoneale moderat active metabolic. Nu s-a reușit determinarea exactă a tumorii primare. Examinarea scintigrafică a evidențiat: tumora primară ileală și determinare secundară ganglionară iliacă comună stângă intens hipercaptante pentru radiotrasorul specific.

Concluzii: Cazul prezentat remarcă un exemplu de rezultat fals negativ al unei tumori neuroendocrine G2 cu punct de plecare neprecizat în cadrul examinării PET/CT F18-FDG, dar care a fost identificată în urma unui examen scintigrafic cu analogi de somatostatină radiomarcați (99mTC- Tektrotyd) punând în evidență limitele fiecărei metode.

Cuvinte cheie: tumoră neuroendocrină, PET/CT, scintigrafie neuroendocrină, fals negativ.

PET / CT WITH F18-FDG EXAMINATION VERSUS SOMATOSTATIN RECEPTOR SCINTIGRAPHY IN A PATIENT WITH NEUROENDOCRINE ILEAL G2 TUMOR

M. Mutuleanu, Romina Costache, Mirela Gherghe

Oncology Institute "Prof. Dr. Al. Trestioreanu", Bucharest, Romania, Nuclear Medicine Department

Introduction: Neuroendocrine tumors are tumors developed from multipotent stem cells migrating from the neural crest. These tumors develop from enterocromaphin cells located in neuroendocrine tissue spread throughout the body. Their morphological classification proposed by WHO is based on the Ki67 proliferation index in G1 tumors ($\leq 2\%$ - highly differentiated), G2 tumors (3-20% - moderate differentiated) and G3 tumors ($\geq 20\%$ - low differentiated). The gold standard method for identifying an occult primary neuroendocrine is neuroendocrine scintigraphy or specific PET/CT examinations with somatostatin analogs radiotracers that attach themselves to somatostatin receptors (Ga68-DOTATATE and 111In-Pentetreotide or 99mTc-Tektrotyd).

Diagnosis and Results: We present the case of a patient with non-specific gastrointestinal symptoms diagnosed following a routine ultrasound with liver tumor formations; the bioptic examination performed revealed hepatic metastasis of neuroendocrine carcinoma G2.

For the identification of primary tumor, because somatostatin analogs are not available, a F18-FDG PET / CT test is indicated which revealed metabolic inactive to F18-FDG metastasis of the liver, and moderately metabolic active retroperitoneal ganglionic metastasis. The exact location of the primary tumor was not identified. The scintigraphic examination revealed: an intense accumulation of the specific radiotracer in the ileal primary tumor and secondary giant lymph node of the left common iliac.

Conclusions: The case represents an example of a false negative result of an occult primary G2 neuroendocrine tumor on the F18-FDG PET/CT examination but was identified following a scintigraphic examination with somatostatin analogs radiotracers (99mTc- Tektrotyd) highlighting the limits of both methods.

Key words: neuroendocrine tumor, PET / CT, neuroendocrine scintigraphy, false negative.

37.DUPLICAȚIA RENALĂ: 99mTc –DTPA ȘI 99mTc-DMSA ÎȘI UNESC FORȚELE PENTRU A DETERMINA FUNCȚIA ȘI VIABILITATEA

Ruxandra Țibu¹, T.M. Ionescu¹, Irena Cristina Grierosu^{1,3}, A.C. Țârcă¹, M.M. Guțu^{1,3}, Magdalena Stârcea²,
Cipriana Ștefănescu^{1,3}

¹Laboratorul de Medicină Nucleară, Spitalul Județean de Urgență „Sf. Spiridon” Iași, România

²Departamentul de Nefrologie Pediatrică, Spitalul ”Sfânta Maria”, Iași, România

³Universitatea de Medicină și Farmacie „Grigore T. Popa” Iași, România

Introducere: Anomaliile renale congenitale reprezintă cea mai comună malformație, însumând aproximativ o treime din totalul anomaliilor fetale. Incidența duplicației renale este de aproximativ 1%. Scintigrafia renală este frecvent utilizată pentru evaluarea funcției fiecărui rinichi, iar în completarea sa poate fi efectuată scintigrama renală statică pentru a identifica viabilitatea și cicatricile renale. Particularitatea cazului este determinarea funcției și viabilității folosind două proceduri scintigrafice distincte, în cazul unei duplicații renale cu istoric de infecții renale repetitive.

Metodă: Pacienta în vârstă de 2 ani a fost diagnosticată postnatal consecutiv infecțiilor urinare repetate, prin URO-CT, cu duplicație reno-pielo-ureterală bilaterală, hidronefroză a unității superioare a rinichiului stâng și ureterocel drept. În prima zi a fost realizată nefrogramele cu 99mTc-DTPA imediat după injectarea i.v. a radiofarmaceuticului, urmată de administrarea Furosemidului în minutul 1, iar în ziua următoare a fost efectuată o renogramă cu 99mTc-DMSA.

Rezultate: Nefrogramele a decelat o funcție aparent normală pentru rinichiul stâng după administrarea diureticului, cu menținerea unei funcții mai reduse a polului renal superior comparativ cu cel inferior. În cazul rinichiului drept s-a evidențiat o obstrucție mecanică incompletă, care ulterior a fost cuantificată. Scintigrama renală relevat dimensiuni scintigrafice diferite ale rinichiului drept comparativ cu cel stâng.

Discuții: Renograma și nefrogramele sunt investigații complementare folosite pentru a evalua o malformație renală complexă din perspective diferite. Nefrogramele cu 99mTc-DTPA determină funcția fiecărei unități a rinichiului afectat în cadrul

duplicației renale bilaterale, datorită mecanismului său de captare specific (filtrare glomerulară). Scintigrama renală statică cu ^{99m}Tc -DMSA evaluează viabilitatea și zonele cicatriceale post-infecție datorită captării sale corticale.

Concluzii: În relație cu cazul prezentat, concluzionăm că scintigrafia renală statică și dinamică poate determina viabilitatea și funcția fiecărui rinichi în parte, în vederea elaborării unei strategii terapeutice personalizate.

Cuvinte cheie: duplicație renală bilaterală, test la Furosemid, nefrogramă, renogramă

DUPLICATE KIDNEY: ^{99m}Tc -DTPA AND ^{99m}Tc -DMSA JOIN FORCES FOR FUNCTION AND VIABILITY

Ruxandra Țibu¹, T.M. Ionescu¹, Irena Cristina Grierosu^{1,3}, A. C. Țârcă¹, M.M. Guțu^{1,3}, Magdalena Stârcea²,
Cipriana Ștefănescu^{1,3}

¹*Nuclear Medicine Laboratory, County Emergency Hospital „Sf. Spiridon” Iasi, Romania*

²*Pediatric Nephrology Department, Saint Maria Hospital, Iasi, Romania*

³*University of Medicine and Pharmacy U.M.F „Grigore T. Popa” Iasi, Romania*

Background: Congenital renal anomalies are the most common malformation types, representing almost a third of fetal anomalies. Duplex kidneys have an incidence of approximately 1%. Dynamic renal scintigraphy is used to determine the functionality of each kidney. In addition to the nephrogram, static renal scintigraphy can be done to assess viability and scarring. The particularity of our case is determining the functionality and viability using two distinctive scintigraphic procedures in a case of bilateral duplicated kidney and repetitive urinary tract infections.

Method: Our 2 years old patient was diagnosed postnatally by URO-CT, subsequent to repetitive urinary tract infections, with bilateral renopieloureteral duplication, left superior unit hydronephrosis and right ureterocele. In the first day it was performed a nephrogram with ^{99m}Tc -DTPA immediately after the iv injection of the radiopharmaceutical and Furosemide administration in the first minute. In the next day a renal scan with ^{99m}Tc -DMSA was added.

Results: The nephrogram revealed an apparent normal function for the left kidney after the diuretic with the upper pole functioning less than the inferior pole. The right kidney revealed an incomplete mechanical obstruction that was later quantified. The renogram unveiled modified scintigraphic dimensions of the right kidney compared to the left.

Discussions: The renogram and nephrogram are complementary investigations used to approach a complex renal malformation from different points of view. ^{99m}Tc -DTPA dynamic renal scan is able to determine the functionality of each unit of the affected kidney in the context of bilateral renal duplication, owing to its specific uptake mechanism (glomerular filtration). ^{99m}Tc -DMSA can evaluate the viability and post-infection scarring, due to its cortical uptake.

Conclusion: In our particular case, dynamic and static renal scintigraphy can determine the functionality and viability of each kidney for a personalized management and treatment approach.

Key words: bilateral duplicated kidney, furosemide test, nephrogram, renogram

38. THE ROLE OF F₁₈-FDG PET/CT BRAIN SCANNING IN PATIENTS WITH ONCOLOGICAL PATHOLOGY FOR ASSESSMENT OF PITUITARY METABOLISM: PRIMARY TUMORS, METASTASIS OR PHYSIOLOGICAL UPTAKE AND SUBSEQUENT MANAGEMENT

E.Spinu*; B. Gradinaru*; D.Piciu; E.Olariu; L.Hitu; G.Rusu; H. Haba; G. Kermoison. A.Piciu; K. Gabora; I.Cecan.

Department of Nuclear Medicine, the Institut of Oncology "Prof. Dr. Ion Chiricuta", Cluj-Napoca, Romania

**E Spinu si B Gradinaru have equally contributed to this paper*

Introduction: The F₁₈-FDG PET/CT scanning protocol for most oncological pathologies includes assessment from the base of the skull up to mid-femoral bones. This article highlights the importance of including brain scan in oncological patients for the evaluation of pituitary metabolism and possible incidentalomas.

Materials and Method: The article includes 4 cases with different oncological pathologies: thyroid folliculo-papillary carcinoma, typical pulmonary neuroendocrine tumor, small cell lung carcinoma and parotid adenocarcinoma. Included in the multidisciplinary therapeutic management for their pathologies, patients were evaluated with F18-FDG PET/CT scans, which included the cerebral region. Although the assessment of cerebral metabolism is difficult to assess properly due to increased glucose consumption, the pituitary gland can have varying degrees of radiopharmaceutical uptake.

Results: The study includes 4 patients with different cancers, known or not with pituitary abnormalities. Following the F18-FDG PET/CT evaluation, the pituitary metabolic status is particular for each patient.

We would also like to mention that the incidence of pituitary findings identified on F18-FDG PET/CT scans performed in our medical department is 0.04% out of over 8000 scans.

Conclusions: Given the particularities of hybrid imaging in pituitary metabolism assessment, we consider that brain scans should be performed in all F18-FDG PET/CT scanning protocols, while taking into account the possible findings: primary tumors, metastases, functioning/non-functioning adenoma, normal functioning pituitary gland with increased metabolic activity - artifact. In order to identify the causes of abnormal findings we recommend further tests including contrast enhanced MRI for pituitary gland and endocrine and metabolic evaluation.