AIM: aim of the study was to evaluate retrospectively the role of 68Ga-DOTA-TOC PET-CT vs CT alone in the detection of bone metastasis in patients with neuroendocrine tumors. Materials and Methods: from January 2013 to July 2015 792 PET-CT with 68Ga-DOTA-TOC were performed. 51 Pts (24 M, mean age 63.92 y) showed bone lesions at first PET/CT evaluation. The primary site of the tumor was gastrointestinal (20), pancreas (11), lung (11), unknown (5), thyroid (3) and ovary (1). PET/CT scan was performed for evaluation after surgery or chemotherapy (12), during therapy (12), staging (7), marker increase (6), suspect of recurrence (12), detection of primary unknown tumor (2). PET/CT scan were performed 60 minutes after the i.v. injection of 3MBq/bw of radiopharmaceutical acquiring images from the base of the skull to the upper third of the thighs. PET/CT and CT alone images were independently evaluated by a Nuclear Physician and a Radiologist unaware of the results of the other modality and of patient history. Bone lesions were calculated in each patient for both PET-CT and CT alone and assigned to 8 regions: base of the skull, column, ribs, scapula, clavicle, sternum, pelvis, long bones. Moreover, Radiologist described the bone lesions as lytic, sclerotic or mixed. Results: PET-CT showed 610 bone lesions whereas CT only 147 (PET-CT vs CT): base of the skull 6 vs 2, column 168 vs 76, ribs 98 vs 24, scapula 24 vs 1, sternum 33 vs 6, clavicle 16 vs 1, pelvis 211 vs 34, long bones 54 vs 3. At CT 31 lesions were lytic, 115 sclerotic and 1 mixed; this technique showed 27 lesions PET-CT negative: 20 sclerotic and 7 lytic. Interestingly two positive PET-CT lesions were vertebral haemangioma at CT. Twenty-five patients were PET-CT positive and CT negative. Conclusions: In our retrospective study 68Ga-DOTA-TOC PET-CT enabled early evaluation of suspected metastatic site in the cortical bone, but also in bone marrow before cortical destruction has occurred. 68Ga-DOTATOC PET-CT results to be a reliable technique for early detection of bone metastasis regardless the characteristics of the lesions. PET scan confirmed its crucial role in the evaluation of NET patients and can led to a change in their management and prognosis.

## EP207

### Esthesioneuroblastoma- evaluation of $^{68}$Ga-DOTATATE PET/CT imaging efficacy in diagnosing and treatment monitoring-initial experience

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Introduction: Esthesioneuroblastoma (olfactory neuroblastoma) is a rare primary sinonasal tumour with neuroendocrine differentiation originating from olfactory epithelium. It is often highly aggressive and leads to local recurrence and distant metastases. The aim of the study was to present our experience concerning the efficacy of 68Ga-DOTATATE in staging, restaging, treatment monitoring as well as its usefulness in radiotherapy planning. Materials and methods: From 2011 to 2016, PET/CT examination was performed on nine patients diagnosed with histological esthesioneuroblastoma (3 women, 6 men, aged 26-66, median 36 years). All of the patients underwent their first PET/CT after surgical resection of primary tumour. 2 patients were after, 1 during and 1 before chemotherapy (chth). 4 out of 9 were before radiotherapy (rth). So far, 3 of the patients had only one PET/CT scan, 5 underwent the examination 3 to 4 times in order to monitor the efficacy of the treatment or as a follow-up. The remaining one patient was examined 8 times with PET/CT. PET/CT was performed on Phillips Gemini 16TF PET/CT scanner. Images were obtained 60 minutes (+10 min) after i.v. administration of 111-185 MBq 68Ga-DOTATATE (depending on patient's weight). Results: First PET/CT scans were negative in 2 patients, in 4 patients before, during or after chth the primary tumour resection scans revealed metastases. In the remaining 3 patients moderate uptake of tracer was present in the postoperative localization. 2 patients (26 and 30 years old) that underwent rth and chth died within a year of diagnosis due to the progression of disease visible on PET/CT scans (bone and liver metastases). The remaining patients are still undergoing treatment monitoring or follow-up using gallium PET/CT. PET/CT scan was used for radiotherapy planning for 3 patient. For the first time it was used for a patient with primary lesion located in nasal cavity, close to the optic nerve. The scan proved to be helpful in determining target volumes for radiotherapy which prevented the patient from losing his sight after therapy. Additionally, in 1 patient PET/CT scan revealed in the right breast small lesion with moderate increased uptake of the tracer, which was identified as a breast cancer. The patient is after tumorectomy and rth. Conclusion: 68Ga-DOTATATE PET/CT scan seems to be an effective tool in staging, restaging and therapy monitoring in esthesioneuroblastoma, however this it still requires further investigation.

## EP208

### Neurocrine Tumour Evaluation: $^{18}$F-FDG-PET/CT Versus Somatostatin Receptor Scintigraphy (SRS)

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**OBJECTIVE** The aim of this study is to identify which imaging modality is the most appropriate in the evaluation of neuroendocrine tumours (NET) based on clinic, histologic and analytic parameters **MATERIAL AND MHETODS** Between June 2013 and April 2016, 72 consecutive patients with neuroendocrine tumours were enrolled in the study. These patients had a somatostatin receptor scintigraphy (SRS) and $^{18}$F-FDG PET/CT. The scan result (positive or negative) was correlated with different variables: localization, tumour grade, Ki67, chromogranin A (Cg A) and serotonin. **RESULTS** All of 72 patients had a SRS and out of them 44, have performed both scans ($^{18}$F-FDG PET/CT and SRS). The overall sensitivities (S) of SRS and $^{18}$F-FDG PET for detection of either primary tumour or metastases were 55,5% and 84,1%, respectively. Based on tumour grade (no available in 52%), the sensitivity for $^{18}$F-FDG PET/CT and SRS, was for grade 1, 63,6% vs 75%; for grade 2, 100%(n=2) vs 60%(n=5) and for grade 3, 100%(n=5) vs 55,67%(n=9) ($p$=0,19 and $p$=0,5 for PET/CT and SRS respectively). Taking into account the proliferation index, S of PET/CT and SRS respectively was: Ki67 &lt 2%: 42,9% vs 57,1%; Ki67 2-20%: 90% vs 71,4% and Ki67&gt 20%: 100% vs 46,7% ($p$=0,006 and $p$=0,31). Cg A and serotonin values do not seem to influence in PET/CT sensitivity. For SRS, the sensitive is 76,9% when Cg A&gt 109ng/ml and 46,7% if Cg A &lt 108ng/ml ($p$=0,029). When serotonin&gt 401ng/ml sensitivity is 90,9% and if serotonin &lt 400 is 59,4% ($p$=0,071). The sensitivity for localization is the same for both SRS and PET/CT scans. **CONCLUSION** For choosing the best the imaging modality to assess TNE, the sensitivity of PET/CT is higher in grade 3/poorly differentiated and Ki67 values&gt 20%. SRS has greater sensitivity in grade 1/well differentiated and Ki67 values &lt 20%. Cg A and serotonin do not seem to influence the sensitivity of PET/CT. The sensitivity of SRS increases at higher values of serotonin and Cg A. The location of TNE does not influence the sensitivity in both tests.

## EP209

### Comparison of sensitivity and specificity of Tc-99m octreotide and I-131 MIBG scintigraphies in diagnosis and localization of pheochromocytoma and neuroblastoma

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Introduction: Tc-99m octreotide scan and I-131 metaiodobenzylguanidine (MIBG), are both valuable agents in diagnosis and localization of neuroendocrine tumors. This study was performed to compare the sensitivity and specificity of these agents in detection of pheochromocytoma and neuroblastoma. Materials and methods: 40 patients with pathologically proven pheochromocytoma/neuroblastoma were enrolled and octreotide and MIBG scans were performed for every patient. A composite reference standard consisting of cytopathology , biomarkers, anatomical imaging and six-month follow-up data was used as a reference for final diagnosis to evaluate the scintigraphic imaging results. Lesion-based and patient-based analysis were performed. Findings: On the basis of lesion-based analysis, overall sensitivity of MIBG was better than octreotide study (94.44% vs 80.56%). Cosidering each disease separately, sensitivity of both scans for pheochromocytoma was 100%, but MIBG study showed a higher specificity (%100 ) than octreotide ( 87.5%). In neuroblastoma, MIBG sensitivity (100%) was better than octreotide (81.25%); however specificity was higher with octreotide study (100% for octreotide versus 92.85% for MIBG). On the basis of patient-based analysis, MIBG had equal sensitivity and specificity of 100% for both diseases. Although octreotide also had 100% sensitivity for pheochromocytoma, its specificity was 87.50%. For neuroblastoma, octreotide study had 81.25% sensitivity and 100% specificity. Conclusion: Both MIBG and octreotide scans show high sensitivity and specificity in detection of neuroendocrine tumors of pheochromocytoma and neuroblastoma. However, MIBG scan with its better sensitivity may be considered the first line functional imaging modality; octreotide can be used to provide complementary information. It is advisable that if any of these two scans becomes negative in a patient with high clinical suspicion, the other one is performed, so that no useful data is missed in patient's management.

## EP210

### Clinical Value of Serum Chromogranin A, Neuron Specific Enolase, CEA, and Calcitonin in Neuroendocrine tumors : Comparison by The 68Ga-DOTA-PEPTIDE PET-CT imaging SUVmax value

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**Aim:** Neuroendocrine tumors (NET) are malignant solid tumors originating from neuroendocrine cells dispersed throughout the body. Differentiated NET overexpress somatostatin receptors (SSTRs), which enable the diagnosis using radiolabeled somatostatin analogues. Most NET produce and secrete a multitude of peptide hormones and amines. In this study, our aim was to determine if there was a relationship between the SSTRs activity obtained from 68Ga PET imaging (SUVmax) and serum tumor markers (chromogranin A, neuron specific enolase: NSE, CEA, and calcitonin). **Materials and Methods:** Sixtyseven patients with histologically confirmed NET who had undergone 68Ga-DOTA-PEPTIDE PET/CT images were included in the study. Serum chromogranin A levels (n:36), NSE (n:17), CEA (n:15), and calcitonin (n:9) were measured. 68Ga-DOTA-PEPTIDE PET/CT images SUVmax values were compared with serum tumor markers, retrospectively. **Results:** The values of lesions SUVmax of the cases were seen that ranged between 4.3 to 181 (median: 24). Serum chromogranin A, NSE, CEA, and calcitonin levels were in the range of 7-817 (median:82), 5.3-278.3 (median:21.2), 0.9-2190 (median:4.5), and 4-13010 (median:800), respectively. There were statistically significant correlation between the SUVmax and serum chromogranin A level. The correlation coefficient value was calculated as r=0.34, ($p<0.046$). Any statistically significant correlation between SUVmax value and other serum tumor markers ($p>0.05$) could not be found. **Conclusion:** 68Ga-DOTA PEPTIDE is suited equally well for staging and patient selection for PRRT with 177Lu-DOTA PEPTIDE. Chromogranin A is considered the best general neuroendocrine serum marker available both for diagnosis and therapeutic evaluation and is increased in 50-100% of patients with various NET. In litherature is not found clinical value of serum tumor marker and 68Ga DOTA PEPTIDE. Our study is the first. Serum chromogranin A level together with 68Ga DOTA PEPTIDE PET/CT could be important in diagnosis, and management in NET. They may be an independent markers of prognosis in patients with NET.

## EP211

### Comparison of lesions detected on F-18 FDG PET-CT and Ga-68 DOTANOC PET-CT and their correlation with Ki-67 index in neuroendocrine tumour patients

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Aim: To study the correlation between F-18 FDG PET-CT and Ga-68 DOTANOC PET-CT with Ki-67 index in patients with neuroendocrine tumours (NET). Materials and Methods: This is a retrospective study in which records of 21 patients diagnosed with NET were analysed. The study included patients sent for staging and response assessment after therapy. All patients had both F-18 FDG PET-CT and Ga-68 DOTANOC PET-CT done in any order. The scans were analysed qualitatively based on the sites of lesions detected or maximum standardised uptake value (SUVmax) of primary lesion or metastatic site, if primary has been resected, detected on one or both scans and correlated with Ki-67 index of each patient. The nuclear medicine physician was blinded to the results of either scan and Ki-67 index and each scan was assessed independently. Results: There were 4 patients in which both F-18 FDG PET-CT and Ga-68 DOTANOC PET-CT detected same sites of lesions. These patients had a median Ki-67 index of 7.5 (range 1.9 to 15). In 8 patients, more lesions were detected on F-18 FDG PET-CT compared to Ga-68 DOTANOC PET-CT. These patients had a median Ki-67 index of 21.5 (range 4.5 to 81). In 9 patients, more lesions were detected on Ga-68 DOTANOC PET-CT as compared to F-18 FDG PET-CT. These patients had a median Ki-67 index of 2 (range 0.9 to 35). However one patient had an unusually high Ki-67 index in this group. If this patient is excluded, then 8 patients in this group had a median Ki-67 index of 1.95 (range 0.9 to 7). Conclusion: This study shows a good correlation between molecular imaging using dual isotopes and a marker of cellular proliferation. Poorly differentiated cells with high index of proliferation show high uptake of F-18 FDG whereas well differentiated cells show high uptake of Ga-68 DOTANOC. This behaviour of cells can guide us in patient directed selection of isotopes and also plan for therapy.

## EP212

### Semiquantitative Analysis Of Physiological Biodistribution of $^{68}$GA-DOTATATE and $^{68}$GA-DOTANOC

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**Objectives:** In this study, in patients who underwent 68Ga-DOTATATE and 68Ga-DOTANOC PET/CT imaging modalities with the diagnosis of NET, it was aimed 1) to determine the areas of physiologic uptake and means (± SD) and value ranges (min. and max.) of these areas, using semiquantitative parameters as SUVmax and SUVmean(±SD) 2) to compare the data obtained with those of the literature so as to define helpful reference ranges for intermediate cases with the intention to discriminate between physiologic and pathologic uptakes. **Materials and methods:** Radiological images of 40 patients (female, n=23 and male, n=17; mean age**,** 52.50±15.82 years) who had undergone $^{68}$Ga-DOTA labeled (TATE