POSTER NUMBER 1

Early Onset Alzheimer's Disease

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Alzheimer's disease is the most common neurodegenerative disorder. Although it is most commonly diagnosed in patients aged 65 or older, it is also the leading neurodegenerative disorder among younger patients aged 45 to 64. Across both age groups, this entity presents clinically with progressive memory loss and cognitive decline and demonstrates distinctive patterns of disease in molecular imaging. Pharmaceutical treatments can ameliorate some of the clinical manifestations of the disease for all age groups.

The accurate, timely, and effective management of early onset Alzheimer's, however, requires consideration of several key differences in the younger subpopulation as opposed to the older population. Early onset cases of disease are strongly associated with genetic inheritance of several autosomal dominant mutations as opposed to the older onset cases where manifestation of the disease is sporadic and has a more complex interaction of environmental and genetic factors. Diagnosis in younger patients can be delayed because the disease is less common in the younger population and as such is more commonly mistaken for other dementing or psychiatric illnesses. Timely diagnosis of disease in the younger patient population allows for early intervention including genetic counseling, education, and long term care planning for patients, families, and caregivers. Molecular imaging is very helpful in the differential diagnosis of dementia as there are classic patterns of uptake in several of the dementing illnesses including Alzheimer's disease and thus imaging can help shorten the length of the diagnostic workup for these patients.

This informational poster aims to increase the readers' understanding of key issues in early onset Alzheimer's disease. This poster shares epidemiological data, as well as, pharmacological and nonpharmacological options in disease management. It also illustrates the differences between autosomal dominant mutations of inherited disease and the genetic component of sporadic disease. Additionally, MRI, 18-F-FDG PET, and 18-F-Florbetapir PET images from a case of early onset Alzheimer's disease are submitted for review. These images demonstrate the importance of molecular imaging in providing confirmatory findings and excluding alternative diagnoses.

POSTER NUMBER 2

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Comparative study of 68Gallium-citrate PET/CT and 18F-FDG PET/CT to diagnose infected orthopedic implants: preliminary results

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TITLE

Comparative study of 68Gallium-citrate PET/CT and 18F-FDG PET/CT to diagnose infected orthopedic implants: preliminary results

PURPOSE

To demonstrate the feasibility and evaluate the diagnostic accuracy of 68Gallium (^{68}Ga)-citrate PET/CT in diagnosing periprosthetic joint infection Also, to compare ^{68}Ga-citrate PET/CT and 18F-Fluorodeoxyglucose (FDG) PET/CT for differentiating periprosthetic joint infection and aseptic implant loosening.

METHOD AND MATERIALS

Adult patients with painful primary hip arthroplasty and radiographic osteolysis around the implant who were pending hip revision were enrolled. Those with prior implant revision surgery, joint replacement for reasons other than osteoarthritis, or underlying inflammatory or infectious disease were excluded. Whole body PET emission scanning was performed 60 min after administration of approximately 5 mCi of ^{68}Ga-citrate. Within the next 24-48 hours, the FDG PET imaging was performed after the injection of 10 mCi of radiotracer using the standard protocol. Tissue samples for culture and histology were taken from regions of intense tracer uptake on either scans during the revision procedure. Extent of radiotracer uptake was compared between the two scans and correlated with operative findings.

RESULTS

The imaging findings of the first patient enrolled into this ongoing study demonstrated intense periprosthetic tracer uptake of both ^{68}Ga-citrate and FDG. FDG benefits from superior image quality due to the blood pool activity and bone marrow uptake associated with ^{68}Ga-citrate. As a result, the maximum standardized uptake values (SUV), normalized to that of the contralateral muscles, were higher in FDG images as opposed to ^{68}Ga-citrate. However, the latter radiotracer showed typical periprosthetic activity, surrounding the head, greater and lesser trochanter, the shaft and tip of the

femoral stem; pathognomonic for hardware infection. This pattern of radiotracer uptake was not seen on FDG images. Multiple biopsies showed diffuse periprosthetic joint infection in this patient.

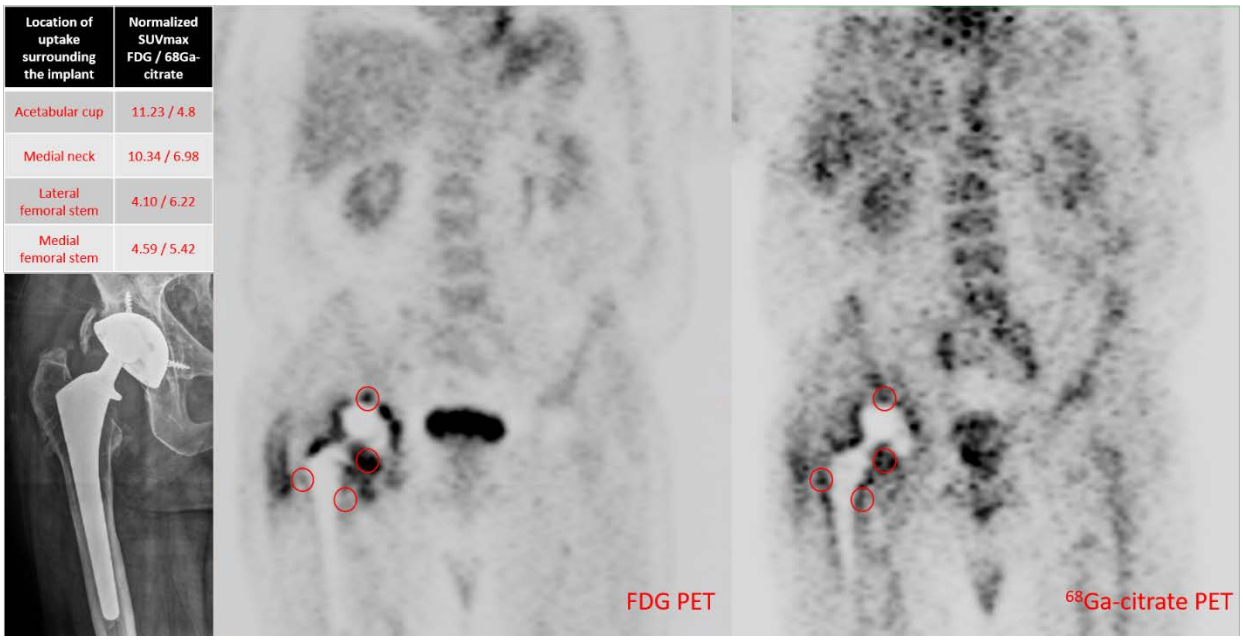
CONCLUSION

Despite suffering from inferior image quality, PET/CT with ^{68}Ga-citrate can successfully identify periprosthetic joint infection. It may also unmask additional foci of infection that are hidden to conventional FDG PET.

CLINICAL RELEVANCE/APPLICATION

This work-in-progress study, once completed after recruitment of the targeted number of subjects, may serve as a valuable tool to differentiate aseptic implant loosening from periprosthetic joint infection, and overcome the diagnostic challenges of the currently available modalities.

Location of uptake surrounding the implant	Normalized SUVmax FDG / 68Ga-citrate
Acetabular cup	11.23 / 4.8
Medial neck	10.34 / 6.98
Lateral femoral stem	4.10 / 6.22
Medial femoral stem	4.59 / 5.42



POSTER NUMBER 3

Sequential PET/CT and PET/MR in multiple myeloma patients

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Introduction: FDG PET/CT (PET/CT) plays an important role in the clinical management of multiple myeloma (MM) at both initial and restaging of patients. MRI provides detailed diagnostic and prognostic data with excellent soft tissue differentiation and high spatial resolution. FDG PET/MRI (PET/MR) is a hybrid imaging modality with several promising clinical applications in MM, particularly in the assessment of osseous lesions. Our primary objective was the diagnostic performance of PET/CT and PET/MR in detecting MM lesions in a post-therapy setting. To date, there has only been one other study from Germany that has compared PET/CT and PET/MR in MM.[1,2] However, this study was limited in that it assessed the PET portion alone of both PET/CT and PET/MR and included 30 patients.
Methods: This was a retrospective study that recruited previously treated MM patients from January 2013 to September 2017, who underwent same day sequential PET/CT and PET/MR studies. The assessment of PET/CT and PET/MR studies was performed using a semi-automated MIM software, with the selection of all lesions above liver SUVmax except for those with osteosclerotic changes and hardware. PET parameters included SUVmax, total lesion glycolysis (TLG) and metabolic tumor volume (MTV). MRI sequences utilized to determine activity of MM lesions include T1, STIR and diffusion weighted imaging (DWI) of MRI. All imaging parameters were correlated with clinical laboratory data, International Myeloma Working Group (IMWG) response groups after induction chemotherapy (IT), after autologous stem cell transplant (ASCT), as well as with progression free survival (PFS).
Results: A total of 87 PET/CT and PET/MR post-therapy studies of 67 patients were analyzed after treatment (n=50 post-autologous stem cell transplant (post-ASCT), n=17 post-induction therapy (post-IT) only). A statistically significant correlation between PET/CT and PET/MR was found ($p<0.00001$). These findings are similar to th PET/MR provided incremental value in differentiating benign from malignant compression fractures (n=4/87, 4.6%), and diffuse spinal involvement with cord compression (n=1/87, 1.1%).
Conclusion: This study has demonstrated that PET/CT results are strongly correlated with those of PET/MR in the detection of MM lesions, with some instances where PET/MR provides crucial incremental information regarding the extent of disease, including confirmation of spinal cord involvement of MM lesions and ability to further confirm benign from malignant lesions. Hence, PET/MR alone has the potential of being a tool for evaluation of MM patients in the post-therapy setting.

References:

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2. Riola-Parada C, García-Cañamaque L, Pérez-Dueñas V, Garcerant-Tafur M, Carreras-Delgado JL. Simultaneous PET/MRI vs. PET/CT in oncology. A systematic review. Revista Española de Medicina Nuclear e Imagen Molecular (English Edition). 2016 Oct 31;35(5):306-12.

POSTER NUMBER 4

Comparative assessment of baseline and interim PET metabolic tumor volumes with respect to survival in Hodgkin Lymphoma using two image analysis softwares

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Objectives: Our objective was to examine the comparability of PET parameters quantified by two different semi-automated 3D Advanced Image Analysis Softwares (AISW), namely MIM (MIM Software Inc., Cleveland, OH) and ROVER (ROI Visualization, Evaluation and Image Analysis provided by ABX advanced biochemical compounds, Radeberg, Germany), as well as assessing the value of these parameters to predict progression free survival (PFS) in patients with Hodgkin Lymphoma (HL).

Methods: A total of 27 patients with newly diagnosed HL who underwent F18-FDG-PET/CT scans before (baseline PET) and early during therapy (interim PET) with standard chemotherapy were included in the study. The PET segmentation algorithms of both AISWs were applied separately to delineate the lesions and quantify metabolic tumor volume (MTV), total lesion glycolysis (TLG) and percentage change (Δ) between the baseline and interim PET studies. Degree of agreement between these two AISWs was measured and the quantitative PET parameters were correlated with PFS. In addition, Deauville score and percent decrease in the sum of the products of the perpendicular diameters (ΔSPD) of the lesions measured on CT scans were also correlated with PFS.

Results: The median follow-up was 3.2 years. There was high degree of agreement between the two AISWs for all measured variables including MTV, TLG, SUVmax and SUVmean for both baseline and interim PET studies (Spearman correlation coefficient range 0.92-0.97, table 1). None of the baseline PET parameters, measured by either AISWs, had significant correlation with PFS. Of the interim PET variables, both MTV and TLG were significant predictors of PFS, with MTV having the highest HR of 2.7 (p= 0.02, 95% CI). Of note, at interim PET, tumor SUV mean/liver SUV mean ratio and tumor SUV mean had HR of 3.09 and 2.04, respectively (p 0.01, 95% CI). In addition, ΔSPD on CT was a predictive factor of PFS with HR of 2.1 (p 0.03, 95% CI).

Conclusion: This study demonstrated consistency in obtaining MTV and TLG between the two clinically-applicable AISWs which provide quantitative methods for analyzing PET/CT images. In addition, these data suggest that MTV, TLG and ΔSPD on interim PET are important predictive factors in HL patient. Applying semi-automated 3D image analysis softwares to quantify metabolic tumor volumes is a reliable method for image interpretation and recommended in predicting PFS in patients with HL.

Table 1- Agreement between variables by MIM and ROVER softwares

	Variable	Spearman correlation coefficient*	mean difference** with 95% CI
Baseline PET	SUVMax Liver	0.90	-0.039 (-0.16, 0.080)
	SUVMax Tumor	0.96	1.38 (-1.22, 3.99)
	TLG	0.97	193.4 (-49.9, 436.7)
	MTV	0.92	30.7 (-21.9, 83.3)
Interim PET	SUVMax Liver	0.90	-0.008 (-0.10, 0.083)
	SUVMax Tumor	0.93	0.23 (-0.14, 0.60)
	TLG	0.92	-66.2 (-223.9, 91.6)
	MTV	0.92	-9.1 (-36.4, 18.1)

*p<0.001 for all measures

**Positive differences indicate MIM > Rover; Negative differences indicate Rover > MIM

Abbreviations:

AIWS: Advanced Image Analysis Software; **CT**: Computed Tomography; **FDG**: Fluorodeoxyglucose**; HL**: Hodgkin Lymphoma; **HR**: Hazard Ratio, **MIM**: MIM Software Inc., Cleveland, OH; **MTV**: Metabolic tumor Volume; **PET**: Positron Emission Tomography; **PFS**: Progression Free Survival; **ROI**: Region Of Interest; **ROVER**: ROI Visualization, Evaluation and Image Analysis provided by ABX advanced biochemical compounds, Radeberg, Germany; **SPD**: Sum of the products of the Perpendicular Diameters**; SUV**: Standardized Uptake Value; **TLG**: Total Lesion Glycolysis; **Δ**: Percentage Change

POSTER NUMBER 5

Can Molecular Breast Imaging (MBI) help in decreasing the percentage of negative breast biopsies?

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Background: Approximately 75% of breast biopsies resulting from suspicious mammographic findings are negative for breast cancer. The use of breast ultrasound for supplemental screening in dense breasts has further increased the rate of negative breast biopsies. We hypothesized that negative molecular breast imaging (MBI) scans can be used to decide which mammogram and ultrasound findings do not need biopsy, thus reducing the high rate of negative breast biopsies. This application of MBI is different from the well-researched application in supplemental screening for dense breasts.
Methods: Patients seen January 2015 or later with mammogram and/or ultrasound findings being considered for BI-RADS 4A and those with "inconclusive" findings on the border between BI-RADS 3 and 4 were called back for MBI scans. A GE camera, Discovery NM750b, was used for MBI scans. A dose of 6.9 mCi of Tc 99m - Sestamibi was injected intravenously into the patient's arm, and imaging was performed using the standard mediolateral-oblique and Cranial-Caudal views for each breast separately. Each image was obtained for 8 minutes. Interpretation was performed in conjunction with the patient's previous breast imaging. The MBI scans were judged against biopsy results, if applicable, or mammogram and/or ultrasound follow-up for one year to determine negative predictive value. Those patients with post-MBI biopsy or a minimum of one-year follow-up data were eligible for inclusion in this study. All statistical analyses were performed by an independent outside expert.
Results: Of the 170 patients who qualified for inclusion in this analysis, 134 (78.8%) had negative MBI scans. In all 134 of these cases, subsequent biopsy and/or imaging performed over a one-year period did not show evidence of cancer. Thus, the negative predictive value of MBI was 100% (95% confidence interval 96.5-100%) among this sample.
Conclusion: The 100% negative predictive value of MBI among this sample suggests that negative MBI may render biopsy unnecessary among patients with inconclusive mammogram and/or ultrasound findings. This study is ongoing to increase sample size and to further include patients who are placed in BI-RADS 4 and 5 categories who are undergoing MBI prior to biopsy.

POSTER NUMBER 6

PET/CT Report Addenda- A Quality Improvement Project. What Can We Learn?

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Background: The purpose of this study is to review PET/CT addenda with regards to the frequency, etiology, time to creation and potential minor versus major clinical impact. This is part of an ongoing quality improvement project to help identify potential methods for improving patient care and PET/CT reporting.

Methods: An IRB-exempt retrospective review of anonymized radiology reports over a 6-year period, January 1, 2010 to December 31, 2015, was performed using Montage, a data mining software tool, and searching for all PET/CT reports with the word "addendum". Results obtained through Montage were de-identified and did not include any protected health information.

Results: There were 4,597 PET/CTs with reports during this period. There was a total of 73 reports found to have an associated addendum, overall frequency of 1.6%. The 5 most common etiologies for PET/CT addenda includes: to correct typographical dictation errors (23.3%, n=17), to report missed findings (20.5%, n=15), to perform a comparison with a prior study (15.1%, n=11), to further clarify a previously described finding (11%, n=8) and to document report communication (8.2%, n=6). Approximately 10% of PET/CT addenda reports were created within 30 minutes of the initial report dictation and approximately 50% of PET/CT addenda reports were created within the first 24 hours of the initial report dictation. 94.5% of PET/CT addenda resulted in minor or no clinical change, as defined by potential for minor or no clinical change; 5.5% of reports were deemed as having the potential for major clinical impact, as defined by potential for significant morbidity or mortality. 21.9% (n=16) of all PET/CT addenda were made by radiologists who did not read the original study.

Conclusion: There was an overall low frequency of PET/CT addenda of 1.6%. The most common etiology of PET/CT addenda was to correct typographical voice recognition errors at 23.3%. Approximately 10% of the PET/CT addenda were created within the first 30 minutes, and approximately half of PET/CT addenda could have been avoided if report finalization did not occur until 24 hours after the initial approval. In addition, approximately 15.1% of PET/CT addenda would have been avoided if comparisons with prior studies was performed at the time of initial report dictation. Finally, most PET/CT addenda had minor/no clinical patient impact.

POSTER NUMBER 7

Fitting I-131 Curves for Thyroid Radiation Dosimetry Calculations

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PURPOSE: The conventional approach to estimate radiation dose (D) to bone marrow for I-131 therapy requires assessing I-131 excretion in individuals by fitting activity-time curves with bi-exponential functions. This retrospective investigation was undertaken to document the % of cases in which this approach succeeds, & implications for estimating D when data do not fit bi-exponential clearance.

METHODS: The γ component of D was determined from whole body camera counts & the β component was determined by well counter measurements of blood samples. Data were collected using a standardized protocol over 0 - 144 hrs following I-131 capsule ingestion for 83 pts (age = 59 ±14 yrs; 41 male; 42 female). Algorithms written in IDL v8.4 were used to fit activity-time curves by a gradient-expansion approach for which Poisson noise was modeled, & χ^2 convergence tolerance imposed of 10^{-5}. Three fitting functions were attempted: Method1 bi-exponential = $A_0 \times \exp(A_1 \times t) + A_2 \times \exp(A_3 \times t)$; Method2 mono-exponential = $A_2 + A_0 \times \exp(A_1 \times t)$; Method 3 polynomial = $A_0 + A_1 \times t + A_2 X\, t^2 + A_3 \times t^3$, for fitting parameters A_i & time points t. % of cases for which models converged, number of iterations attempted for model convergence, % error of fitted curves to original data, & D estimates were tabulated.

RESULTS: For both γ & β components, using Method1, % of cases that converged was lower (65% & 60% versus 98% & 99%, $p < 0.05$), # iterations were higher (10±6 &11±4 versus 4±3 & 6±2, $p < 0.05$), & % errors higher (7±8% & 1±2% versus 5±4% & 0.4±0.2%, $p < 0.05$), than for Method2. Method1 & Method2 D values were similar (3.8±3.1 & 7.3±4.8 versus 3.8±3.1 & 6.7±4.0 cGy/GBq, $p > 0.09$) with high correlation ($r > 0.994$). Method3 D values were also highly correlated ($r > 0.993$) to Method2 D values, but Method3 D values were lower (3.7±3.0 & 6.5±4.1 cGy/GBq, $p < 0.003$), as reflected by significant Bland-Altman trend (slope = -0.02±0.01, $p = 0.05$).

CONCLUSION: Even though attempts to fit I-131 excretion data by bi-exponential functions sometimes fail, it is always possible to fit data & estimate D by mono-exponential functions. Because I-131 excretion data could not be modeled by bi-exponential functions in 35-40% of cases, & had greater % error differences from original data when curve fitting was possible, it is preferable to fit I-131 data with mono-exponential functions, with better fit to original curve data while requiring fewer iterations to converge for faster computational time.

POSTER NUMBER 8

Treatment Response Following Y-90 Glass Microsphere Therapy.

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Objectives:
To assess treatment response for all patients who received Y-90 glass microspheres radioembolization for hepatocellular carcinoma at the Boston VA Healthcare System and compare these results to published data.

Methods:
All cases of HCC treated with Y-90 glass microspheres at the Boston VA Healthcare System from July 2015 until September 2017 were evaluated for local response as measured by presence or absence of progression within the treated regions of the liver. Treated regions included lobar, partial lobar, and regions containing tumors that involved portions of both lobes of the liver. Progression was defined as the presence of new tumors within the treated region and/or an increase in vascularity of tumors within the treated regions as evaluated on post treatment CT or MRI imaging. Overall survival (OS) was recorded for all patients treated for HCC within this time period. Published literature measures for time to progression (TTP) and OS were compared to results.

Results:
18 patients were treated. 23 doses were administered to 21 hepatic regions. Thirteen patients had a single treatment to a part or a whole hepatic lobe. Five patients had 2 injections; either to treat a single region with dual arterial supply or to treat different regions of the liver.
Of the 21 treated regions 9 demonstrated progression with a TTP of an average of 5 months (range 0.8-9.9), 9 demonstrated no progression for an average of 4.7 months (1.8-8.6), and 6 had no data due to short term follow-up.
Of the 18 patients, 11 were alive at the end of the study for an average of 10.3 months (3.3 – 24.6). Seven died at an average of 6.3 months (3.1-9.5). Overall survival (OS) for all patients combined was an average of 8.7 months (3.1-24.6).
Two published studies with TTP and OS statistics for Y-90 glass microspheres were identified with a literature search. Articles were selected because they had similar BCLC (Barcelona Clinic Liver Cancer) tumor stages as our population (Stages B and C). One study (Hilgard) reported progression in 76 of their patients with a TTP of 10 months (95%CI 6.1-16.4). The second study (Salem) stratified their results by BCLC tumor stages. Using their subpopulation data for the 101 Stage B and C patients the weighted average of TTP can be calculated as 9.3 months (4.4 -18.1).
OS post treatment was 16.4 months (95% CI 12.1 – n.c.) (Hilgard) and 11.6 months weighted average (6.5-29.6) (Salem).

Conclusion:
Average TTP (5 months) was less than comparable published studies (TTP 10 and 9.3 months). Overall survival (OS) (8.7 months) was also less than published values (16.4 and 11.6 months). Several factors may contribute: relative timing of radioembolization in course of the illness, a much smaller sample size, and shorter length of data collection. Further data collection and evaluation are warranted.
Hilgard, Hepatology 2010;52:1741. Salem, Gastroenterology 2010 Jan;138(1):52-64.

POSTER NUMBER 9

Survey of Endocrinologists and Thyroid Surgeons in Northeastern New York Suggests a Limited Adoption of the 2015 American Thyroid Association Guidelines for the Management of Thyroid Carcinoma

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***OBJECTIVE*:** The present study is designed to determine whether the referral patterns of endocrinologists and thyroid surgeons have evolved to incorporate the 2015 American Thyroid Association (ATA) guidelines for the management of thyroid carcinoma. These guidelines have re-classified many patients previously considered intermediate risk now as low risk and indicate that I-131 NaI therapy may be routinely indicated for patients in the newly defined low-risk category.

METHODS: An electronic survey was sent to endocrinologists and thyroid surgeons in three separate practice environment in both Albany and Saratoga counties of northeastern New York. The survey described six clinical vignettes, each of which isolated a clinical variable that would have classified a patient as intermediate risk based on the 2009 guidelines, though as low risk on the 2015 guidelines. The respondents were asked to state whether they would refer the patient in the vignette for I-131 NaI therapy, would not refer the patient or would need more clinical data to decide whether a referral is appropriate.

RESULTS: Seventeen responses were received from endocrinologists, thyroid surgeons and radiologists. 72 to 78% of respondents stated that patients with N1a disease, in the absence of any additional suspicious clinical parameters, would be referred for therapy. 67% stated that minimal extrathyroidal extension would prompt a referral. 56% stated that tall cell features associated with a T1bNx malignancy would be an indication for I-131 NaI therapy. By comparison, only 5% of respondents indicated that a patient with N1a disease would not be referred to nuclear medicine, whereas 11% would not refer a patient with minimal extrathyroidal extension.

CONCLUSIONS: The responses to the clinical vignettes suggest that there are specific clinical data points which trigger an automatic referral for I-131 NaI therapy. In the present study, these trigger points include minimal extrathyroidal extension, any N1a disease and any malignancy with tall cell features. However, in the 2015 ATA guidelines, these clinical variables are considered to represent low-risk disease for which I-131 NaI ablation may not routinely be recommended. These results indicate that, within the specific geographic region of northeastern New York, the 2015 ATA guidelines have not been adopted in clinical practice. The re-classification of intermediate risk patients as low risk by the 2015 guidelines has not clearly resulted a perceivable change in management of these patients.

POSTER NUMBER 10

Evaluating the concordance of hepatobiliary scintigraphy and ultrasound findings in the evaluation of acute cholecystitis - An institutional review.

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BACKGROUND:

Acute cholecystitis is a commonly encountered disease in both the emergency and inpatient setting. Traditionally, hepatobiliary radionuclide scintigraphy (HIDA) has been considered the gold standard for diagnosis of cholecystitis, with a reported sensitivity of 97%. Given the widespread availability, low cost, and short examination time; ultrasound (US) has become a preferred modality for the initial evaluation of acute cholecystitis, despite being less reliable than HIDA.

At our institution, US is most often the initial imaging examination of choice and a subsequent HIDA scan is often obtained for equivocal studies. We aim to evaluate the concordance of ultrasonographic and scintigraphic findings of patients with a clinical diagnosis of acute cholecystitis.

METHODS:

MONTAGE was used to search our Powerscribe 360 reporting database with the following query terms “hepatobiliary mebrofenin –(minus)ejection” with filters for location site and nuclear medicine modality. Between October 12, 2016 and October 12, 2017, 628 HIDA scans for the evaluation of acute cholecystitis were identified. HIDAs that were inconclusive or limited for cholecystitis were excluded.

A search using the query terms “cholecystitis” with filters for location site and ultrasound modality was performed and identified 4144 US scans for the evaluation of acute cholecystitis during the period of October 12, 2016 and October 12, 2017.

Using spreadsheet software and matching patient’s medical record numbers, 307 patients who had an US within 3 days of a HIDA scan were identified. HIDA results were categorized as “positive” or “negative”. US results were categorized as “negative”, “positive”, or “equivocal” for the assessment of acute cholecystitis.

RESULTS:

A total of 307 patients underwent both HIDA and US (n=370), of which 104 positive HIDA scans and 203 negative HIDA scans were identified.
Of the patients with positive HIDA (n=104), 35% (n=36) had a positive US, 51% (n=53) had an equivocal US, and 14% (n=15) had a negative US.
Of the patients with negative HIDA (n=203), 19% (n=38) had a positive US, 46% (n=94) had an equivocal US, and 35% (n=71) had a negative US.
In patients with equivocal US findings, 36% had positive HIDA and 64% had negative HIDA scans.

CONCLUSIONS:

For evaluation of acute cholecystitis, our limited institutional review of 307 patients demonstrated between 35-48% discordant findings on HIDA and US. Further studies may elucidate patient demographic factors that might affect the concordance between HIDA and US. Factors such as BMI, lab values such as WBC and LFTs, and patient age may affect whether an US or HIDA is a more appropriate initial test for cholecystitis. Other parameters that can be evaluated are length of stay and time to surgery for patients who get US followed by HIDA versus HIDA alone.

POSTER NUMBER 11

Impact of Lu-177 in patients with progressive NET

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Objective: Metastatic NET is a progressive disease that requires aggressive treatment either with somatostatin (SS) analogue or antineoplastic agent. For those patients that progress despite these therapies, very few options exist. Recently, a beta emitter Lu-177 attached to a SS analogue has shown promising results. We evaluated the effects of 4 doses of Lu-177 in patients with progressive NET despite medical therapies.

Methods: 11 patients who completed 4 doses of Lu-177 with follow up imaging and visits to assess radiologic and clinical responses were included. Response evaluations were based on radiologic and clinical symptomatology changes before and after therapy.

Results: Out of the total 11 patients we look at 6 patients who have a complete follow up with radiologic studies and a physical follow up. Our results indicate 4 out of the 6 patients demonstrated improvement in radiologic evaluations and symptomatology, 1 patient with worsening radiologic and symptomatology and 1 with stable radiologic and improved symptoms.

Conclusion: As previously noted, this study confirms that Lu-177 has a positive impact on patients with progressive NET.

POSTER NUMBER 12

Rapid post - PRRT quality assurance scan in patients with metastatic neuroendocrine tumors

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ABSTRACT

Background: Neuroendocrine tumors are characterized by overexpression of somatostatin receptors, which is utilized for peptide receptor radionuclide therapy (PRRT) with somatostatin analogs such as ^{177}Lu-DOTATATE resulting in objective responses, prolonged progression-free and overall survival, symptomatic improvement and enhanced quality of life. The objective of this study is to understand the value of performing a rapid quality assurance post-therapy whole body scan (Tx-WBS) in patients who receive ^{177}Lu-DOTATATE treatment as an outpatient procedure.

Method: Six patients who received multiple ^{177}Lu-DOTATATE therapy cycles from May, 2017 to September, 2017 for treatment of metastatic neuroendocrine tumors under the Lutathera expanded access program (EAP), underwent a rapid quality assurance (QA) whole body scan, 2 - 2.5 hrs after receiving the treatment. Although scan acquisition at 24hrs is preferable, early imaging was favored in consideration of patient convenience and quality assurance. Planar whole body images were obtained at a speed of 30cm/min on a dual-head Philips Brightview XCT gamma camera equipped with medium-energy general purpose collimators. Peak energy was centered on ^{177}Lu (208 keV photon) with a 20% window. Visual assessment and comparison of Tx-WBS scan with pre-therapy ^{68}Ga-DOTATATE (5 patients) or ^{111}In-Pentetreotide (1 patient) imaging was performed.

Results: Six patients (3 men and 3 women; mean age 62.8 yrs ± 6.3 yrs), with histological confirmation of metastatic neuroendocrine carcinoma of small intestine, underwent a total of fourteen Tx-WBS. No cutaneous contamination, extravasation or unexpected distribution was noted in any of these scans. Normal distribution in blood pool, liver, kidneys and spleen was noted. In 12/14 Tx-WBS performed in 5/6 patients, uptake was noted in tumor lesions showing high SUV or uptake at pre-therapy diagnostic molecular imaging studies. Tx-WBS demonstrated uptake in hepatic, peritoneal, osseous and nodal metastases. Smaller sized lesions or metastases with low SUV values in baseline diagnostic scans including nodal, peritoneal, hepatic or osseous metastases were not clearly visualized on Tx-WBS. None of the Tx-WBS findings were discordant with baseline scans.

Conclusions: A rapid quality assurance whole body scan should be considered after PRRT as a simple, effective and reliable method of providing confidence and validation regarding the correct radiotracer bio-distribution and absence of events such as contamination and extravasation.