

Each month the editor of Newsline selects articles on diagnostic, therapeutic, research, and practice issues from a range of international publications. Most selections come from outside the standard canon of nuclear medicine and radiology journals. These briefs are offered as a monthly window on the broad arena of medical and scientific endeavor in which nuclear medicine now plays an essential role. The lines between diagnosis and therapy are sometimes blurred, as radiolabels are increasingly used as adjuncts to therapy and/or as active agents in therapeutic regimens, and these shifting lines are reflected in the briefs presented here.

PET/CT vs CT in FUO

Buchrits et al. from the Beilinson Hospital (Petah-Tikva) and Tel Aviv University (both in Israel) reported on August 20 in the *European Journal of Internal Medicine* (2021;20;S0953-6205[21]00264-8) on a study comparing the efficacy of ^{18}F -FDG PET/CT with that of contrast-enhanced CT in diagnosis of classic fever of unknown origin (FUO). The retrospective study included 303 patients referred for PET/CT for FUO. Final diagnoses, based on clinical, radiologic, and pathology data at latest follow-up (≥ 6 mo after hospital discharge), served as the gold standard and included infectious diseases in 111 (36.5%) patients, malignancies in 56 (18.4%), and noninfectious inflammatory conditions in 52 (17.1%). In 84 (28%) patients, FUO resolved without definitive diagnoses. Overall sensitivity and specificity for PET/CT were 88.7% and 80.9%, respectively, with corresponding percentages of 75.2% and 90.2% for CT. Analysis indicated that PET/CT was necessary in 79 (26%) patients and that endovascular infection, hematologic malignancy, and large vessel vasculitis were the only factors associated with this necessity. The authors concluded by recommending “PET-CT as the imaging modality of

choice for patients with classical FUO, when endovascular infection, hematologic malignancy or large vessel vasculitis are suspected.”

European Journal of Internal Medicine

PET/CT and RT in Meningiomas

In an article published on August 16 in *Radiation Oncology* (2021;16[1]:151) Kowalski et al. from the University of Maryland School of Medicine and School of Pharmacy (Baltimore, MD) reported on the utility of PET/CT with the somatostatin receptor ligand ^{68}Ga -DOTATATE in conjunction with MR imaging in delineating radiation treatment target volumes and evaluating treatment response. The study included 19 patients who underwent both ^{68}Ga -DOTATATE PET/CT and MR imaging for radiation planning and/or posttreatment follow-up. Ten of the patients underwent both imaging modalities at both timepoints. Meningiomas were grade I in 9 patients and were not biopsied in 8. The majority (10) involved the base of the skull. Ten (53%) patients received postoperative radiation, and 9 (47%) received fractionated radiation treatment. In the subgroup who had undergone planning and posttreatment imaging with both modalities, adaptive thresholding software measured total lesion activity. PET/CT identified intraosseous (4, 22%), falcine (5, 26%), and satellite (3, 19%) lesions and resulted in a change in management for 3 patients. Mean total lesion activity decreased from pre- to posttreatment PET by 14.7%, and maximum total lesion activity decreased by a median of 36%. MR-based meningioma volumes did not significantly change between the 2 acquisitions. The authors concluded that “future studies are warranted to: (1) assess the sensitivity and specificity of ^{68}Ga -DOTATATE PET/CT; (2) evaluate the impact of ^{68}Ga -DOTATATE PET/CT-based planning on

treatment outcomes; and (3) assess the prognostic significance of these post-treatment imaging changes.”

Radiation Oncology

PET and Benign Anthracotic Lymphadenitis

Ivanick et al. from the University of California San Francisco and the Roswell Park Comprehensive Cancer Center (Buffalo, NY) reported in the July issue of the *Journal of Thoracic Disease* (2021;13[7]:4228–4235) on a study exploring the clinical, radiographic, and histologic characteristics of benign anthracotic lymphadenitis in patients referred for endobronchial ultrasound (EBUS)-guided biopsies. Benign anthracotic lymphadenitis is uncommon but has been associated with false-positive PET/CT findings. The retrospective study included 20 patients referred for EBUS-guided biopsies of ^{18}F -FDG PET-positive mediastinal and hilar lymph nodes (with demonstrated anthracotic pigment as the only histologic abnormality) during initial diagnosis or treatment of suspected malignancy. Of note, $>90\%$ of patients in this U.S.-based study were born outside of the country and their histories indicated likely exposure to biomass fuel or urban pollution. More than 90% had bilateral ^{18}F -FDG-avid lymph nodes, with an average SUV of 7.9 ± 2.2 . The authors concluded that benign anthracotic lymphadenitis may be “an underrecognized cause for PET-positive lymph nodes in patients undergoing work-up for malignancy” and that these results “support the importance of sampling mediastinal and hilar lymph nodes even when SUVs are highly suggestive of malignancy.”

Journal of Thoracic Disease

PET/CT Imaging and Utility in COVID-19

In an article published online on August 8 ahead of print in *Clinical*

Imaging (2021;80:262–267), Yeh et al. from Memorial Sloan Kettering Cancer Center (New York, NY) reported on initial imaging findings and potential clinical utility of ^{18}F -FDG PET/CT in patients with confirmed COVID-19. The retrospective review included data on 31 patients (21 men, 10 women; mean ages, 57 ± 16 y) who were diagnosed using real-time reverse transcription-polymerase chain reaction and who had undergone contemporaneous PET/CT imaging for routine cancer care in March and April 2020. Thirteen of the patients had positive PET/CT findings, suggesting a detection rate of 41.9%. Clinical data indicated that patients with positive scans had significantly higher rates of symptomatic COVID-19 infection than those with negative imaging (77% and 28%, respectively), with corresponding percentages of 46% and 0% for hospitalization. ^{18}F -FDG lung avidity was seen in 11 (84.6%) patients (mean lung $\text{SUV}_{\text{max}} = 5.36$), and 6 (46.2%) of the 13 positive patients had extrapulmonary PET/CT findings in thoracic lymph nodes. Lung SUV_{max} was not associated with COVID-19 symptoms, severity, or disease course. The detection rate was significantly lower when the scan was performed before the swab test than after (18.8% and 66.7%, respectively). The authors concluded that although ^{18}F -FDG PET/CT has limited sensitivity for detecting COVID-19 infection, “a positive PET scan is associated with higher risk of symptomatic infection and hospitalizations, which may be helpful in predicting disease severity.”

Clinical Imaging

PSMA PET/CT Utility in High PSA and Negative Biopsy

Bodar et al. from Amsterdam University Medical Center/VU University, the Netherlands Prostate Cancer Network, Cancer Center Amsterdam, and the Netherlands Cancer Institute (all in Amsterdam, The Netherlands) reported on August 14 online ahead of print in *Urologic Oncology* on the diagnostic performance of prostate-specific membranous antigen (PSMA) imaging to localize primary prostate cancer in men with persistent elevated prostate-specific antigen (PSA) levels and previously negative prostate biopsies. The study included 34 such men (median PSA = 22.8 ng/mL) who underwent imaging with either ^{18}F -DCFPyL at 1 study institution or ^{68}Ga -PSMA-11 at another. Participants were divided into 3 groups for retrospective analysis: (1) those with previous negative multiparametric MR findings ($n = 12$); (2) those with a positive MR imaging but negative MR-targeted biopsies; and (3) those in whom multiparametric MR imaging was contraindicated. Patients with PSMA-avid lesions then underwent 2–4 PSMA-targeted biopsies in combination with systematic biopsies. PSMA tracer uptake in the prostate suspicious for prostate cancer was observed in 22 (64.7%) patients, in 18 of whom PSMA-targeted biopsies were performed. In 3 (16.6%) of these patients targeted biopsies showed International Society of Urological Pathology scores of 1–2 for prostate cancer. The other men had inflammation or benign findings confirmed at biopsy core histopathology. The authors concluded that “the clinical value of PSMA PET/CT for patients

with an elevated PSA level and negative for prostate cancer biopsies was low.”

Urologic Oncology

^{11}C -MET PET and Localization in Primary Hyperparathyroidism

In an article published on August 16 ahead of print in the *Scandinavian Journal of Surgery*, Iversen et al. from Aarhus University Hospital (Denmark) evaluated the use of ^{11}C -methionine PET/CT imaging in patients with primary hyperparathyroidism and either persistent primary disease after parathyroidectomy or inconclusive preoperative localization on ultrasound and $^{99\text{m}}\text{Tc}$ -sestaMIBI imaging. The study included 36 patients analyzed in 2 groups: (1) with ^{11}C -methionine PET/CT performed before parathyroidectomy ($n = 17$); and (2) with ^{11}C -methionine PET/CT performed after unsuccessful parathyroidectomy and before reoperation ($n = 19$). Across the 2 groups, PET/CT identified a true-positive pathologic parathyroid gland confirmed by a pathologist (positive-predictive value of 91%) in 30 (83%) patients. In group 1, 16 (94%) patients had such true-positive imaging findings, resulting in clinical benefit in 13 (76%) patients. In group 2, 14 (74%) patients had true-positive imaging, resulting in a clinical benefit in 9 (47%) patients. The authors summarized their findings that in this setting of patients planned for initial surgery or reoperation of primary hyperparathyroidism and inconclusive conventional imaging, ^{11}C -methionine PET/CT gave parathyroid surgeons clinical benefits in the majority of cases.

Scandinavian Journal of Surgery

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