

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 imaging 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. We include a small section on noteworthy reviews of the literature.

¹³¹I Remnant Ablation and Postoperative Outcomes

Hay et al. from the Mayo Clinic (Rochester, MN) reported on March 17 ahead of print in *Mayo Clinic Proceedings* on a study designed to determine whether radioiodine remnant ablation reduces cause-specific mortality or tumor recurrence rates after bilateral lobar resection in patients with low-risk adult papillary thyroid cancer. The study included the records of 2,952 such patients who underwent resection over a 60-y institutional period. Twenty-year grouped analyses showed that ¹³¹I remnant ablation was administered in 3% of patients from 1955 to 1974 (period 1), 49% from 1975 to 1994 (period 2), and 28% from 1995 to 2014 (period 3). During the earliest period, the cause-specific and tumor recurrence rates after bilateral lobar resection were 1.0% and 6.8%, respectively. After resection + ablation these respective rates were 0% and 5.9%. The corresponding rates for period 2 were 0.3% and 7.5% for resection alone and 0.9% and 12.8% for resection + ablation. In period 3, the corresponding rates were 0% and 9.2% for resection alone and 1.4% and 21% after resection + ablation. Additional analyses showed nonsignificant differences in tumor recurrence

rates for node-negative and -positive patients undergoing resection alone or resection + ablation. Fifteen-year locoregional recurrence rates did not identify significant differences in these groups. The authors summarized their findings that radioiodine remnant ablation administered to patients with low-risk adult papillary thyroid cancer over a 60-y period did not reduce rates of either cause-specific mortality or tumor recurrence. They concluded that they would not recommend radioiodine remnant ablation for such patients undergoing bilateral lobar resection with curative intent.

Mayo Clinic Proceedings

⁶⁸Ga-FAPI PET/CT and Checkpoint Inhibitor-Associated Myocarditis

In an article published on February 25 in *Frontiers in Cardiovascular Medicine* (2021;8:614997), Finke et al. from University Hospital Heidelberg, DZHK (German Center for Cardiovascular Research), DKFZ (German Cancer Research Center), and DZL (German Center for Lung Research) (all in Heidelberg, Germany) reported on a study of the utility of ⁶⁸Ga-fibroblast-activation protein inhibitor (⁶⁸Ga-FAPI) PET/CT in detecting immune checkpoint inhibitor (ICI)-associated myocarditis. The retrospective study included imaging from 26 patients who had received ICI therapy. Tracer uptake in the 23 patients with no signs of cardiac disease was compared with that in the 3 patients with suspected ICI-associated myocarditis. These 3 patients underwent cardiac catheterization, with biopsies assessed for inflammatory cells. Lymphocyte infiltration was found in biopsied myocardium. Additional clinical and laboratory assessments showed electrocardiographic abnormalities and wall motion abnormalities on echocardiography. These 3 patients' PET/CT results showed higher cardiac uptake ($SUV_{\text{median}}, 1.79$) than that in the 23 patients who had received ICIs but had no signs of immunologic adverse effects or cardiac impairment

($SUV_{\text{median}}, 1.15$). The authors concluded that ⁶⁸Ga-FAPI “may be used in order to identify affected patients at an early stage,” and that, when integrated into cancer stage diagnostics, such imaging contributes to cardiac risk stratification in addition to biomarkers, electrocardiography, and echocardiography.

Frontiers in Cardiovascular Medicine

PET/CT, CT, and EBUS/TBNA in NSCLC Staging

Al-Ibraheem et al. from the King Hussein Cancer Center (Amman, Jordan), Essen University Hospital (Germany), the Università di Bologna (Italy), and the International Atomic Energy Agency (Vienna, Austria) reported on March 17 in *BMC Medical Imaging* (2021;21[1]:49) on a study of the comparative diagnostic accuracy of ¹⁸F-FDG PET/CT, CT, and endobronchial ultrasound/transbronchial needle aspiration (EBUS/TBNA) in preoperative mediastinal lymph node staging of non-small cell lung cancer (NSCLC). The single-institution retrospective study included the records of 101 patients diagnosed with NSCLC, 57 of whom had histopathologic confirmation of disease. ¹⁸F-FDG PET/CT, when compared with CT alone, was found to have better sensitivity (90.5% and 75%, respectively) for all patients as well as in patients with histopathologic confirmation (83.3% and 54.6%, respectively). In addition, PET/CT showed higher specificity in mediastinal lymph node staging than CT in all patients (60.5% and 43.6%, respectively) and in the histopathology-confirmed subgroup (60.6% and 38.2%, respectively). The negative predictive values of mediastinoscopy, EBUS/TBNA, and PET/CT were 87.1%, 90.91%, and 83.33%, respectively, with overall accuracy highest and similar for mediastinoscopy (88.6%) and EBUS/TBNA (88.2%), followed by PET/CT (70.2%). Analysis by nodal stage produced similar comparative results. Using PET/CT and EBUS/TBNA

in patients with histopathologic confirmation, 28 true-positive and true-negative findings were correlated with final N staging. Lymph nodes with $SUV_{max} > 3$ on PET/CT were significantly more likely to be true-positive. PET/CT also identified metastatic lymph nodes in 4 patients that were not identified on EBUS/TBNA. The authors concluded that multimodality staging of mediastinal lymph nodes in NSCLC is essential for accurate staging and appropriate management and that ^{18}F -FDG PET/CT has better overall diagnostic utility than CT. They added that the “ SUV_{max} of mediastinal lymph nodes can help in predicting metastases,” but that a positive ^{18}F -FDG PET/CT mediastinal lymph node finding (particularly if such a result would change the treatment plan) should be verified by histopathology.

BMC Medical Imaging

^{99m}Tc -MAA and ^{89}Y -Brem SPECT/CT TNRs

In an article published on February 25 ahead of print in the *Journal of Vascular and Interventional Radiology*, Villalobos et al. from Emory University School of Medicine (Atlanta, GA) reported on studies quantifying the relationship between tumor-to-normal ratios (TNRs) attained from ^{99m}Tc -macroaggregated albumin (^{99m}Tc -MAA) and posttreatment ^{90}Y -bromsstrahlung SPECT/CT in patients with hepatocellular carcinoma (HCC) treated with glass microspheres. The study included 90 patients with HCC who underwent a total of 204 ^{99m}Tc -MAA and ^{90}Y -bromsstrahlung SPECT/CT scans for ^{90}Y -glass microsphere radiation segmentectomy or lobar treatment. Regions of interest around targeted tumor and nontumoral liver tissue were assessed and compared for the 2 imaging procedures. Mean TNRs for ^{99m}Tc -MAA and ^{90}Y -bromsstrahlung SPECT/CT were 2.96 ± 1.86 and 2.29 ± 1.10 , respectively. Mean TNRs in lobar treatments were 2.88 ± 1.67 and 2.17 ± 0.89 for ^{99m}Tc -MAA and ^{90}Y -bromsstrahlung SPECT/CT, respectively. Mean TNRs in radiation segmentectomy were 3.02 ± 2.01 and 2.39 ± 1.25 for ^{99m}Tc -MAA and ^{90}Y -bromsstrahlung SPECT/CT, respectively. TNRs from

the 2 SPECT/CT procedures showed overall a moderate correlation. The authors concluded that the “TNR attained from ^{90}Y -bromsstrahlung SPECT/CT is often underestimated, positively correlated with, and less variable than that attained from ^{99m}Tc -MAA SPECT/CT.”

Journal of Vascular and Interventional Radiology

^{68}Ga -PSMA PET/CT and Mesorectal Lymph Node Metastases

Leitsmann et al. from University Medical Center Göttingen (Germany) reported on March 1 in *Frontiers in Surgery* (2021;8:637134) on a study describing mesorectal lymph node metastasis as a potential key index in ^{68}Ga -prostate-specific membrane antigen (^{68}Ga -PSMA) PET/CT imaging for recurrent prostate cancer. The prospective study included 12 men with biochemical recurrence after primary therapy who prospectively underwent baseline ^{68}Ga -PSMA PET/CT imaging showing mesorectal lymph node metastases. Eight of these patients underwent follow-up ^{68}Ga -PSMA PET/CT to evaluate treatment response. The median prostate-specific antigen (PSA) level on initial PET/CT was 5.39 ng/mL, and all patients had subsequent changes in therapeutic management. Androgen deprivation therapy (ADT) was initiated in 7 patients, and 1 restarted initial ADT. Three patients also received salvage radiation therapy, and docetaxel chemotherapy was initiated in 1. Decreases in PSA levels were detected in all patients after a median of 10 mo (median, 2.05 ng/mL). Six of the 8 patients who underwent follow-up ^{68}Ga -PSMA PET/CT showed a decrease or complete absence of PSMA uptake in the mesorectal lymph nodes. The authors concluded that “mesorectal lymph node metastases detected by ^{68}Ga -PSMA PET/CT seem to be a relevant localization of tumor manifestation and may serve as index lesion in the treatment of recurrent prostate cancer.” They added that in addition to the known benefits of ADT

and salvage radiation, in cases where imaging can identify sole mesorectal lymph node metastases individualized therapy (such as salvage lymphadenectomy or defined-field radiotherapy) could be options.

Frontiers in Surgery

Reviews

Review articles provide an important way to stay up to date on the latest topics and approaches through valuable summaries of pertinent literature. The Newsline editor recommends several general reviews accessioned into the PubMed database in February and March. van Oostenbrugge and Mulders from Radboud University Medical Center (Nijmegen, The Netherlands) provided an overview of “Targeted PET/CT imaging for clear cell renal cell carcinoma with radiolabeled antibodies: Recent developments using girentuximab,” published on March 17 ahead of print in *Current Opinion in Urology*. In an article published on March 2 in *Frontiers in Endocrinology (Lausanne)* (2021;12:640117), Arifin and Bulte from Johns Hopkins University/School of Medicine (Baltimore, MD) reviewed the current advantages, limitations, and clinical utility of “In vivo imaging of pancreatic islet grafts in diabetes treatment.” De la Vieja and Riesco-Eizaguirre, from the Instituto de Salud Carlos III, the Hospital Universitario de Móstoles, and the Universidad Francisco de Vitoria (all in Madrid, Spain), summarized “Radioiodide treatment: From molecular aspects to the clinical view” in the February 27 issue of *Cancers (Basel)* (2021;13[5]:995). In an article published on March 16 ahead of print in *Future Oncology*, Bagguley et al. from the Peter MacCallum Cancer Centre (Melbourne), the E.J. Whitten Prostate Cancer Research Centre at Epworth (Melbourne), the University of Melbourne (Parkville), St. Vincent’s Hospital (Darlinghurst), Royal Melbourne Hospital (Parkville), and Austin Hospital (Heidelberg; all in Australia) detailed “The role of PSMA PET/CT imaging in the diagnosis, staging, and restaging of prostate cancer.”