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. We have also added a small section on noteworthy reviews of the literature.

SPECT/CT and Renal Tumor Lymphatic Drainage

Kuusk et al. from The Netherlands Cancer Institute (Amsterdam) and Leiden University (The Netherlands) reported on December 6 ahead of print in the *Journal of Urology* on a study designed to investigate lymphatic drainage patterns from renal tumors with SPECT/CT imaging after injection of an intratumoral radiotracer. The phase II prospective study included 40 patients with cT1-3 (<10-cm) cN0M0 renal tumors of any subtype. Patients underwent intratumoral ultrasound-guided injection of 0.4 mL ^{99m}Tc-nanocolloid, followed by preoperative imaging of sentinel nodes with lymphoscintigraphy and SPECT/CT. At surgery, sentinel nodes and locoregional nonsentinel nodes were removed, with guidance from a gamma probe and a mobile gamma camera. Lymphatic drainage outside the locoregional retroperitoneal areas was seen in 14 (35%) patients, and 8 (20%) had supradiaphragmatic sentinel nodes. Although sentinel nodes from renal tumors were mainly located in their respective locoregional retroperitoneal templates, simultaneous sentinel nodes located outside the suggested lymph node dissection templates, including supradiaphragmatic sentinel nodes, were observed in more than one third of patients. These data also indicate that lymphatic drainage in this patient group shows high individual variability and that the "findings have potential implications for the design of future clinical or translation studies investigating lymphonodular involvement."

Journal of Urology

^{18}F-FDG PET/CT and Fever in Immunocompromised Children

On December 13 ahead of print in the *Journal of Paediatrics and Child Health*, Wang et al. from the Royal Children's Hospital, the Peter MacCallum Cancer Centre, the Peter Doherty Institute for Infection and Immunity, and the University of Melbourne (all in Melbourne, Australia) reported on the clinical impact of ^{18}F-FDG PET/CT in children with prolonged or recurrent fever with malignancy or after hematopoietic stem cell transplantation. The authors rated the effect of PET/CT imaging as high when it contributed to diagnosis of a new site of infection/inflammation, led to changes in antimicrobials or chemotherapy, or indicated additional investigations or specialist consultation contributing to a final diagnosis. The retrospective study included 14 patients with prolonged or recurrent fever (median age, 11 y; 46% with diagnoses of acute lymphoblastic leukemia). All underwent ^{18}F-FDG PET/CT, with a median absolute neutrophil count of 0.47 cells/μL at imaging. Record reviews indicated that the clinical impact of PET/CT was high in 11 (79%) patients, resulting in initiation or changes in antimicrobials in 3 and cessation of antimicrobials in 5. When compared with conventional imaging, PET/CT identified an additional site of clinically significant infection/inflammation in 7 patients. Of the 10 patients whose cause of fever had been identified, PET/CT contributed to the final diagnosis in 6 (60%). The authors concluded that these data support the potential utility of ^{18}F-FDG PET/CT in immunocompromised children with prolonged or recurrent fever but noted the need for prospective studies "to compare PET/CT with conventional imaging, to identify the optimal timing of ^{18}F-FDG PET/CT, and to study the role of subsequent scans to monitor response to therapy."

Journal of Paediatrics and Child Health

MR and SSTR PET in Cardiac Sarcoidosis

Pizarro et al. from University Hospital Bonn (Germany) and the Evangelische Lungenklinik Berlin (Germany) reported on December 12 ahead of print in *ESC Heart Failure* on cardiovascular MR and ^{68}Ga-DOTATOC PET/CT in patients previously diagnosed with cardiac involvement of histologically proven systemic sarcoidosis. The authors looked at the assessment of persistence over time of cardiac sarcoid involvement, using cardiovascular MR and other imaging data to determine the characteristics of resulting myocardial damage.

The study included 27 patients (49.9 ± 11.8 y; 59.3% men, 40.7% women) with systemic sarcoidosis who had been identified in an earlier study as having cardiac involvement. Each patient underwent repeat cardiovascular MR imaging, and 17 underwent ^{68}Ga-DOTATOC PET/CT when clinically indicated. Over a median follow-up period of 2.6 y, no patients experienced sudden cardiac death; in fact, none died of any cause. Two patients developed third-degree atrioventricular blocks and underwent device therapy. Pathologic MR findings persisted in 14 patients (51.9%). Cardiac sarcoidosis remission was judged to be mainly the result of resolution of acute inflammatory processes. ^{68}Ga-DOTATOC PET/CT identified 1 patient with regions of raised tracer uptake that correlated well with acute inflammatory changes assessed on MR imaging. The authors noted the fact that after ~2 y, previous cardiac sarcoidosis persisted in only slightly more than half of patients,

with no cardiac deaths, and that ^{68}Ga-DOTATOC PET/CT facilitated visualization of acute myocardial inflammation.

ESC Heart Failure

Long-Term Cardiac Dysfunction and Pediatric DTC

In the December issue of *Thyroid* (2017;27:1481–1489) Klein Hesselink, from the University Medical Center (Gröningen, The Netherlands), and researchers from a consortium of medical centers and hospitals in The Netherlands reported on a study of long-term survivors of pediatric differentiated thyroid cancer to determine the incidence of cardiac dysfunction and atrial fibrillation, the effect of selected treatment-related variables, and correlations between cardiac dysfunction and plasma biomarkers. The study included 66 asymptomatic adult survivors ≥5 y after pediatric diagnosis (84.6% women, 15.4% men; median age at diagnosis, 16 y; median follow-up, 17 y after treatment) and 66 sex- and age-matched controls. Each participant underwent assessment with echocardiography, plasma biomarkers (*N*-terminal probrain natriuretic peptide, high-sensitive troponin-T, and galectin-3), and 24-h Holter electrocardiography. Diastolic dysfunction was defined as an early diastolic septal and/or lateral tissue velocity <2 standard deviations from mean age-adjusted reference data. The authors identified diastolic dysfunction in 14 asymptomatic survivors (21.2%). One patient's left ventricular ejection fraction was <50%. The overall diastolic function of survivors was lower than that of controls. Older age and larger waist size were correlated with decreased diastolic function. None of the biomarkers, thyrotropin levels, or cumulative administered radioiodine dose were correlated with diastolic dysfunction. The authors concluded that although "systolic function is unaffected, diastolic dysfunction is frequently observed in asymptomatic long-term survivors of pediatric differentiated thyroid cancer, which may suggest early cardiac aging."

Thyroid

MBF and Cardiac Allograft Vasculopathy

Bravo, from the Brigham and Women's Hospital and Harvard Medical School (Boston, MA), and colleagues from Massachusetts General Hospital (Boston), Brown University Alpert School of Medicine (Providence, RI), and the Ottawa Cardiovascular Center (Canada) reported on December 8 ahead of print in the *European Heart Journal* on the incremental diagnostic and prognostic value of myocardial blood flow (MBF) to standard myocardial perfusion imaging (MPI) with PET for detection of cardiac allograft vasculopathy. The study included 94 orthotopic heart transplant patients (prognostic group), including 66 who underwent invasive coronary angiography and PET within 1 y of transplantation (diagnostic group). PET evaluation included semiquantitative MPI, quantitative MBF, and left ventricular ejection fraction. PET cardiac allograft vasculopathy severity scores (0–3) were modeled on criteria from the International Society for Heart and Lung Transplantation. Follow-ups for a median of 2.3 y monitored patients for major adverse events (death, retransplantation, acute coronary syndrome, and hospitalization for heart failure). The sensitivity, specificity, and positive and negative predictive values of PET perfusion imaging alone for detection of moderate-to-severe cardiac allograft vasculopathy were 83%, 82%, 50%, and 96%, respectively. When assessments of left ventricular ejection fraction and stress MBF were added, the corresponding values improved to 83%. 93%, 71%, and 96%. Twenty major adverse events were documented on follow-up, with an annualized event rate of 5%, 9%, and 25% in patients with normal, mild, and moderate-to-severely abnormal cardiac allograft vasculopathy, respectively, on PET severity scores. The authors concluded that "Multiparametric cardiac PET evaluation, including quantification of MBF, provides improved detection and gradation of cardiac allograft vasculopathy severity over standard myocardial perfusion assessment and is predictive of major adverse events."

European Heart Journal

PET/CT in Sepsis of Unknown Origin

On December 4, ahead of print in *Critical Care Medicine*, Fort et al. from the Hôpital Lyon Sud/Hospices Civils de Lyon and the Centre Hospitalier Pierre Oudot Bourgoin Jallieu (both in France) reported on 2 critically ill patients in whom the researchers assessed the benefit and feasibility of early PET/CT in identifying undiagnosed sepsis. The patients were admitted with suspected sepsis and altered mental states. All initial bacteriologic samples were negative, which led to suspicions of underlying malignant hemopathy. PET/CT imaging then showed underlying infectious foci in both patients. Within 48 hours, both developed a clearly identified sepsis linked to the described PET/CT foci, with resulting positive outcomes from this early identification. The authors concluded that the fact that PET/CT precisely detected deep foci of infection about 48 hours before clinical symptoms suggested its potential utility for intensive care patients with sepsis of unknown origin.

Critical Care Medicine

Reviews

Hwang et al. from Johns Hopkins University/School of Medicine (Baltimore, MD) provided a current overview of "Molecular imaging of the autism spectrum disorder" on December 12 ahead of print in the *International Review of Psychiatry (Abingdon, England)*. MacManus et al. from a consortium of Australian, German, and U.S. institutions provided an update on "Anatomic, functional, and molecular imaging in lung cancer precision radiation therapy: Treatment response assessment and radiation therapy personalization" in the December issue of *Translational Lung Cancer Research* (2017;6:670–688). A companion article in the same issue (2017;6:617–620) from Bennett Greenspan, MD, MS, from the Medical School of Georgia/Augusta University, detailed the "Role of PET/CT for precision medicine in lung cancer: Perspective of the Society of Nuclear Medicine and Molecular Imaging" (2017;6:617–620).