Nuclear Oncology: Diagnosis and Therapy

I. Khalkali, J. Maublant, and S. Goldsmith, eds.

Philadelphia, PA: Lippincott Williams and Wilkins, 2001, 588 pages, $159

Nuclear Oncology: Diagnosis and Therapy is a comprehensive textbook detailing the uses of nuclear imaging in the detection and management of neoplastic diseases. Its purpose is to "serve clinical nuclear medicine practitioners, and physicians such as oncologists and radiologists, in understanding the utility and practice of nuclear procedures in oncology." It certainly fulfills those objectives and exceeds most expectations.

The chapters are written by experts in the field from all over the United States, Canada, Europe, and Israel. There are 86 contributing authors. The 42 chapters are well referenced. Each stands on its own as a scholarly contribution, providing an excellent bibliography for anyone desiring further information on a topic. The first 9 chapters are the overview, with general topics such as instrumentation, radiopharmaceuticals, multidrug resistance, monoclonal antibodies, radiopharmaceutical therapy of bone metastases, pediatric nuclear oncology, cardiotoxicity, and nephrotoxicity. Chapter 2, on instrumentation, provides fundamental information about detection devices that should be useful to any trainee studying for board examinations and to practitioners. The discussion of coincidence imaging and ultrahigh-energy collimators is excellent, although developments subsequent to the publication of the book render these techniques less favorable than current PET. The many diagrams and tables provide handy guides to understanding current instruments. Table 2.5 lists particular specifications for various PET devices and is useful for comparison across vendors.

I particularly appreciate Chapter 7, Pediatric Nuclear Oncology, by Connolly, Drubach, and Treves. It contains useful information for anyone performing pediatric nuclear medicine. Table 7.2 lists the doses of various radiotracers used on children, along with a minimum administered dose. Particular emphasis is placed on neuroblastoma, the most common extracranial nonhematologic malignancy in children. The other tumors covered extensively are osteosarcoma and lymphoma. Although leukemia is the single most common type of malignancy in children, patients afflicted with leukemia are uncommonly evaluated by nuclear techniques. Bone scans of 2 patients with acute lymphoblastic leukemia are included and are a reminder that a child with this disease may present with a limp or bone pain.

The remaining 31 chapters focus on particular applications. In most of the disease categories, there is a chapter on PET imaging and, if relevant, on radionuclide therapy. Not only does the book cover imaging of the primary tumor and metastases but also techniques that assist in the management of the patient: for example, lymphoscintigraphy in breast cancer and in melanoma, hepatic artery pump evaluation for the treatment of primary or metastatic tumors of the liver, and cerebrospinal fluid and shunt imaging. Parathyroid scintigraphy is well covered. The different techniques that have been used over the years are detailed, and several excellent examples of sestamibi parathyroid images are provided. Our institutional experience differs in that we find that SPECT is often quite useful, particularly the 3-dimensional rotating projection images, in separating thyroid from nearby parathyroid uptake and in helping the surgeon determine the depth of the parathyroid gland for cases in which a limited, directed operation is contemplated.

Most of the images are quite good, representing the state of the art at the time the chapters were submitted. A few PET images are not attenuation corrected. Many of the PET images contain correlative anatomic images that strengthen the confidence in the interpretation.

Chapter 36 is a concise summary of the work on gallium and lymphomas of Drs. Front and Israel. It is especially useful because their precise acquisition parameters are included, thus enabling others to replicate the high-quality images demonstrated. Both adrenal cortical and adrenomedullary scintigraphy are discussed in Chapter 37 by Dr. Gross. The role of NP59 (a radiolabeled cholesterol analog) in "benign" disorders of the adrenal cortex, such as Cushing's syndrome and primary aldosteronism, is reviewed along with its role in the evaluation of the patient with an incidentally discovered adrenal mass. Imaging of pheochromocytoma with metaiodobenzylguanidine is discussed.

I enjoyed reviewing this book and have found it useful for helping to train our residents and fellows in the use of radionuclides for imaging and treating various diseases. It should be a part of radiologic and nuclear medicine libraries worldwide and is especially helpful to staff, fellows, residents, and medical students participating in the care of patients with tumors.

Because of the rapid advances in this field, hardcover books can quickly become out of date. This book is still quite current. However, the authors and publishers should consider a CD version with periodic updates. In addition, specific protocols for each type of study would be a useful addition for those who wish to transform the information in the textbook into tangible increases in local image quality.

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