
Preface

Radionuclide and Hybrid Bone Imaging

In most nuclear medicine departments the isotope bone scan remains the most frequently requested and performed investigation. However, over the years the way in which it is applied in clinical practice has changed dramatically. Originally, its use was almost exclusively in malignancy, and while this remains the most important application, there are now numerous and ever increasing indications for its use in benign disorders. As is so often the case in nuclear medicine, the great strength of the bone scan is its ability to identify functional change before structural change, and therefore the bone scan is often positive at a time when other investigations such as X-ray or CT will be negative.

Anyone working in the field of medicine will be aware of the dramatic pace of change in technology, but even accepting this, what has happened in the field of imaging in recent years has been truly remarkable. The introduction of positron emission tomography (PET) has dramatically impacted on oncological practice, for example, it is now difficult to imagine how one could optimally manage patients with lung cancer or lymphoma without having access to staging PET scans. For PET, FDG is the universal tracer, and in general, this is exquisitely sensitive for the detection of bone metastases, but there are exceptions to this, for example, FDG performs relatively poorly in the identification of metastatic prostate cancer. Another PET tracer F18 fluoride can provide extremely high quality bone scan images and it is predicted that in the not too distant future this will become the routine method for imaging the skeleton. The most dramatic advance however has been the development of hybrid imaging systems. These combine the strengths of the various imaging modalities, for example, the functional aspect of nuclear medicine with the anatomical detail of CT. This is best established with PET/CT, and nowadays there is essentially no such thing as PET alone. More recently tomographic nuclear medicine systems (SPECT) have been combined with CT technology to provide SPECT/CT systems. While these are not yet widely available, they are already having a dramatic impact on our diagnostic ability, and there seems little doubt that SPECT/CT will become the routine way to carry out nuclear medicine studies in the not too distant future.

Identifying pathology in the skeleton is extremely important and as has been outlined above there have been dramatic changes in recent years as to how this may be achieved. This book will comprehensively cover all

the clinical aspects and also the basic science as it relates to bone, the imaging modalities available and the various radiopharmaceuticals that are used. These topics will be addressed by a distinguished faculty of clinicians and scientists who have national and international reputations in their fields.

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