Letter to editor

The Remarkable Applications of Nuclear Medicine in Orthopedic

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TO THE EDITOR

Nuclear Medicine is a form of scientific technology that gets more and more evolved over the last decades. With the use of advanced technologies, such as computerized-camera, PET and PET/CT, new generation PCs and new radiopharmaceuticals, it contributes to primary and safe diagnosis of various diseases. In Orthopedic, the use of Nuclear Medicine regards either the diagnosis or the facilitation of the therapy of many diseases. Periarticular infection and aseptic prosthesis loosening remain the most common and serious complications of total hip arthroplasty and total knee arthroplasty. Single-Photon Emission Computed Tomography (SPECT) and PET with computed tomography (SPECT/CT and PET/CT) provide additional information and increase diagnostic accuracy [1,2]. Also, Dual Phase 18F-fluoridePET/CT(DPFP) has a considerable result in differentiating septic from aseptic loosening of hip prostheses. DPFP may be employed before revision arthroplasty to evaluate implant for loosening and sepsis in loosened implant [3]. In regard to osteomyelitis and implant-associated infections, 18F-FDG PET identifies, with high sensitivity, the presence of osteomyelitis in patients with nonspecific clinical symptoms of infection [4]. As far as Orthopedic in children and young adults is concerned, 18F-fluoride PET/CT is useful for assessing the skeleton in metabolic bone diseases and evaluating benign skeletal lesions such as osteoid osteoma [5]. Even in the field of Orthopedic and Oncology, Nuclear Medicine gives undeniable critical help. In Tumor-Induced Osteomalacia (TIO) the only curative therapy is the resection. However, they are extremely difficult to be detected with conventional imaging modalities. Along with this, clinical studies show that Gallium-68 DOTANOC PET/CT can be used as the first imaging modality in such patients [6,7]. Furthermore, with the help of FDG PET/CT, Osteoid Osteomas (OOs), which are bone tumors that rarely occur in the cervical spine, can be confidently removed with no iatrogenic injury (injury of the vertebral artery, leakage of cerebrospinal fluid, infectious complications and neurological injury) [8]. In addition, static 18F-fluoride PET is a highly sensitive imaging modality for detection of benign and malignant osseous abnormalities and lytic and early marrow-based metastases, by identifying their accompanying reactive osteoblastic changes [9]. It has already been found since 2005, that 99mTc(V)-DMSA scan can identify, with high sensitivity, the metastases of osteosarcoma [10]. Last but not least is the large contribution of Nuclear Medicine in the field of Orthopedic and Nuclear Medicine’s clinics, should be sponsored to examine the absolute superiority of the Nuclear Medicine’s modalities to conventional techniques.

REFERENCES


