Multiple inflammation foci as a cause of undiagnosed fever: value of whole body ^{99m}Tc(V)-DMSA scintigraphy

To the Editor: The Hell J Nucl Med has printed an article comparing technetium-99m pentavalent-dimercapto succinic acid (^{99m}Tc(V)-DMSA) as an effective agent diagnosing acute bone and joint infection [1]. We now report that ^{99m}Tc(V)-DMSA can identify foci of infection in a case of fever of unknown origin. ^{99m}Tc(V)-DMSA, as a tumor-seeking agent, has been developed by Yokoyama et al. in 1981 [2] and many other related studies have followed [3-5]. We performed ^{99m}Tc(V)-DMSA whole body scintigraphy (WBS) in a 60 years old female patient admitted to our hospital with fever, fatigue, and right leg pain. Clinical diagnosis was cellulitis. Staphylococcus aureus was detected in blood cultures and treatment with antibiotics was initiated. After two days, the patient had joint pain, cough and dyspnea. Pneumonia and septic arthritis were diagnosed, antibiotic treatment was modified, but fever continued. A whole body scintigraphy was performed 4-5h after the intravenous administration of 740MBq of freshly prepared ^{99m}Tc(V)-DMSA using a dual head gamma camera (Siemens, E-Cam Dual Head, USA). The scan revealed increased tracer uptake in the right sternoclavicular region, the right lateral iliac wing, the left major trochanter and, the lower lumbar vertebrae (Fig. 1). Magnetic resonance imaging (MRI) of the lumbar spine-pelvis and computerized/tomography (CT) of the thorax were performed and multiple abscesses were shown in the right lateral gluteal region in an area of 8x2.5cm (Fig. 2) and the right sternoclavicular joint, in an area of 2.5x2cm (Fig. 3). In addition, appearance concordant to spondylodiscitis, an anterior epidural phlegmon at the level of L3-S1 vertebrae and a lesion concordant to bursitis in the left major trochanter were observed. All abscesses were drained but the patient was operated because there was no local improvement and neurologic symptoms appeared.

Serious pyogenic infection as a cause of undiagnosed fever is common [6]. The most widely and also currently used radionuclide agents for the detection and location of pathology in patients with undiagnosed fever are gallium 67 (^{67}Ga-C) citrate, labeled leucocytes and recently fluorine-18 fluorodeoxyglucose (^{18}F- FDG) [7]. Recently, uptake ^{99m}Tc(V)-DMSA by inflammatory tissues has been reported [4, 5]. It is suggested that

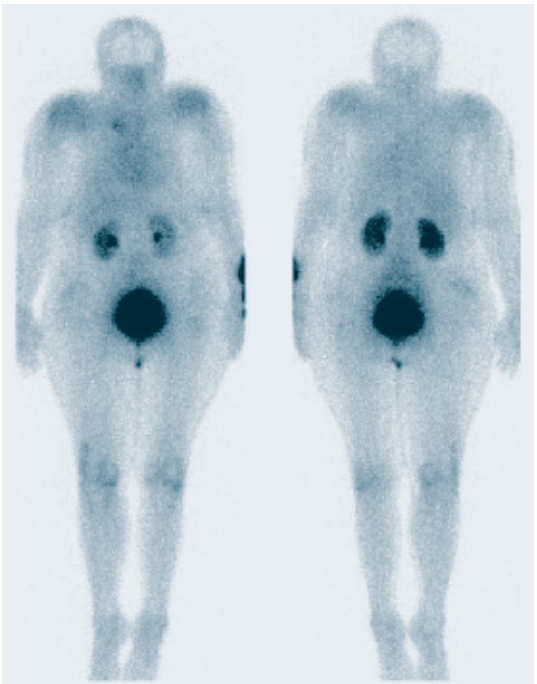

Figure 1. Whole body ^{99m}Tc(V)-DMSA scintigraphy shows increased tracer uptake in the right sternoclavicular region, right lateral iliac wing region, left major trochanter and lower lumbar vertebrae.

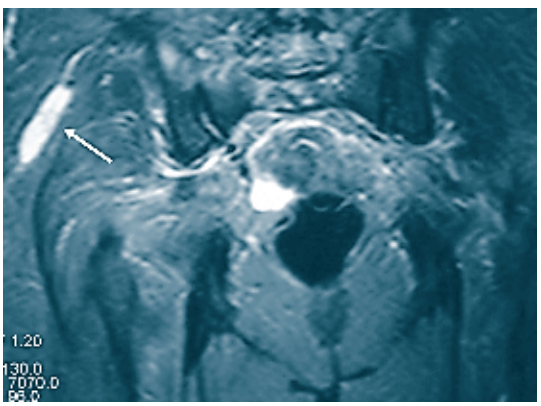

Figure 2. Weighted-T2 MRI scan of the pelvis shows a hyperintense lesion in the right lateral gluteal area with dimensions: 8×2.5cm. Corresponding to an abscess.

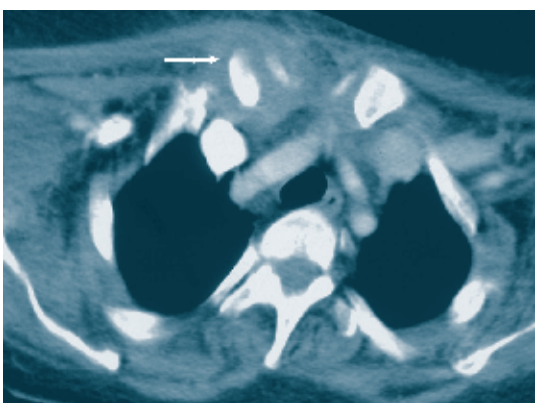

Figure 3. Thorax CT demonstrating an inflammatory lesion in the right sternoclavicular joint area.

^{99m}Tc(V)-DMSA scintigraphy is a useful alternative to ^{67}Ga-C scintigraphy in the detection of intra-abdominal abscesses and inflammatory bowel disease [8, 9]. Compared with conventional inflammation imaging agents, i.e. ^{67}Ga and labeled leucocytes, ^{99m}Tc(V)-DMSA has superior characteristics such as it is easy to prepare, it has a lower cost and lower radiation dose, and provides results within a shorter period. Although the mechanism of accumulation has not yet been completely clarified, it is suggested that ^{99m}Tc(V)-DMSA infiltrates into the interstitial space of inflammatory lesions because of increased capillary permeability [10]. It has been demonstrated that the main transport protein of ^{99m}Tc(V)-DMSA is albumin [11]. Physiological uptake has been demonstrated in breast tissues, kidneys, nasal mucosa and the blood pool. Because of normal renal excretion, a localized lesion in the kidneys and urine bladder could not be demonstrated. If localizing infection signs are present, radiologic imaging modalities such as CT or MRI are preferred because they provide more accurate information of the local extent of soft tissues lesions [12]. Scintigraphic techniques permit WBS and are particularly useful in identifying multifocal involvement. Thus, CT or MRI guided biopsy can then be done to elucidate the nature of the lesions. This case shows that ^{99m}Tc(V)-DMSA WBS is useful as a screening technique in searching inflammatory lesions.

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