Journal of Clinical and Medical Images

Case Report ISSN 2640-9615 |Volume 5

Traditional Medicine- Related Pitfalls and Artifacts on Bone Scintigraphy

Deeksha Shetty, Naima Al Balushi, Mazin Al Battashi and Mustafa Al Nassari

Department of Nuclear Medicine and molecular imaging center, Royal Hospital, Muscat, Oman

***Corresponding author:**

Deeksha Shetty,
Department of Nuclear Medicine and molecular imaging center, Royal Hospital, Muscat, Oman,
Tel:00968 -24627090 / 24627070,
E-mail: deeksha_5@hotmail.com

Received: 19 Nov 2021
Accepted: 02 Dec 2021
Published: 08 Dec 2021
J Short Name: JCMI

Keywords:

Traditional medicine; Three phase bone scan; Artifacts

Citation:

Deeksha Shetty, Traditional Medicine- Related Pitfalls and Artifacts on Bone Scintigraphy. J Clin Med Img. 2021; V5(19): 1-3

1. Abstract

Three phase bone scan is performed routinely to identify bone and joint abnormalities in patients with suspected acute osteomyelitis with or without septic arthritis. However, abnormalities detected on bone scan may not always represent disease. We present two cases where the use of traditional medicine by the patients creates unusual pitfalls and artifacts. In addition it highlights the clinical relevance of SPECT-CT in differentiating uncommon artifacts.

2. Introduction

Bone scan is one of the most common and oldest examinations among all nuclear medicine procedures [1]. Three phase bone scan is a routine investigation when evaluating acute osteomyelitis with or without septic arthritis. After the intravenous injection (IV) and the initial distribution through the whole body by simple perfusion, the radiotracers used commonly, i.e. 99mTc-labelled diphosphonates such as hydroxyl methylene diphosphonate (HDP) and methylene diphosphonate (MDP) in a standard dose of 600MBq-740MBq(16.2mCi-20mCi), diffuse into the extracellular space. Due to its affinity to calcium, diphosphonates are then bound in a simple physicochemical way called chemo-adhesion. The regional skeletal uptake is determined both by the initial perfusion and the metabolism of the bone mainly by the osteoblasts [2]. While the sensitivity of this imaging procedure is high, various technical and procedural artifacts should be kept in mind when interpreting positive scan findings [3].

3. Case Number 1

21 years old male known to have sickle cell disease (SCD) present with acute onset of fever and back pain was referred to nuclear medicine department to rule out acute osteomyelitis of the lumbar spine.

Patient was administered 740MBq (20 mCi) of Tc99m HDP following which flow and blood pool images were acquired of the lower back under the gamma camera (Symbia Intevo, Siemens; Germany). Delayed images where acquired at 2 hrs post injection along with whole body images. The blood flow, blood pool and delayed images were unremarkable. SCD changes were noted in thoracic and lumbar spine vertebral bodies and the spleen.

Persistent well-defined Photopenic defect was noted superimposing the right sacral bone anteriorly in the blood flow and blood pool (Figure1.A). However, the same Photopenic defect was also noted in the delayed images but more superior than in the early images (Fig1.B). Hence, SPECT-CT of the pelvis was performed, which revealed high density metal in the large bowel with clumping of meal in right iliac fossa creating attenuation artifact in the right sacral bone (Figure1.C and D).

Clinical history revealed patient had ingested herbal medicine which contained mercury the night prior to the scan.

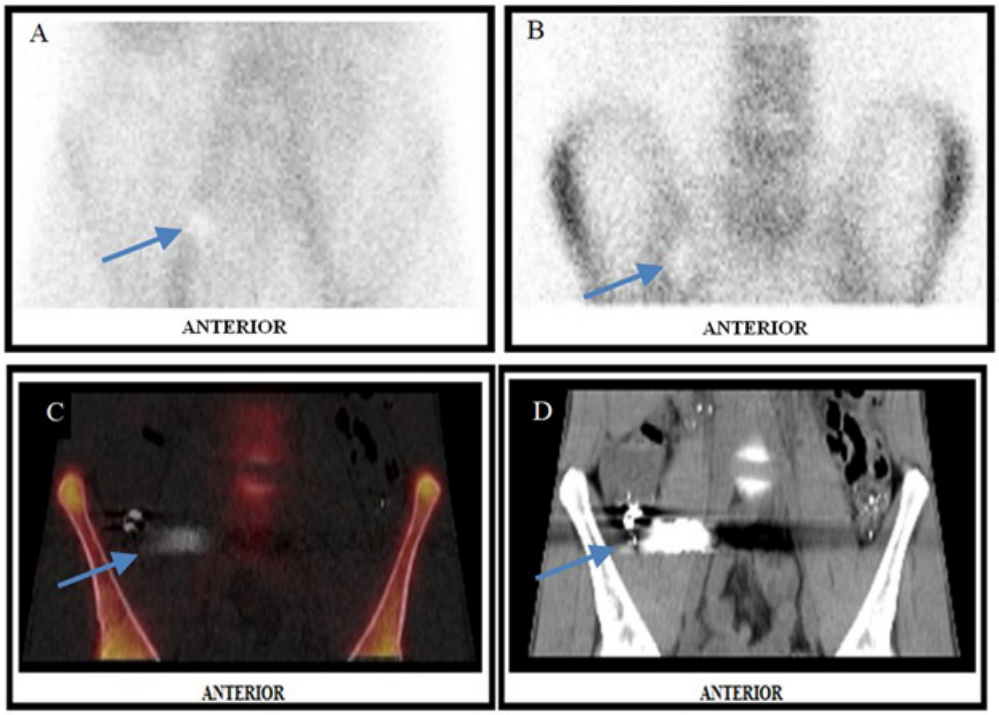

Figure 1: Blood pool (A) and delayed images (B) with photon deficient area (blue arrow). Plain CT of pelvis (C) and SPECT/CT images (D) revealed high density metal in the large bowel loops.

4. Case Number 2

34 years old male with acute onset of severe pain in bilateral ankle joints and soles of both feet with no history of recent trauma was referred for bone scan to rule out active arthritis. Patient was administered 740MBq (20 mCi) of Tc99m MDP following which flow and blood pool images were acquired of the feet under the gamma camera (E-cam, Siemens; Germany). Delayed images where acquired 2hr post injection along with whole body images. The blood flow, blood pool and delayed static of ankle and feet were unremarkable. However, the delayed whole-body scan revealed incidental focal increased radiotracer uptake in the left side of the skull and the SPECT images of the skull localized the radiotracer uptake to be in the left temporal bones (Figure 2 A&B). The recent CT brain images in the PACS were reviewed and the bone widow of the skull revealed lytic lesion with sclerotic margin in the left temporal bone as shown in (Figure 2 C). The patient was interviewed again and he revealed that he had a history of "kaiy" performed to his left side of the skull as treatment for chronic head ache few years back.

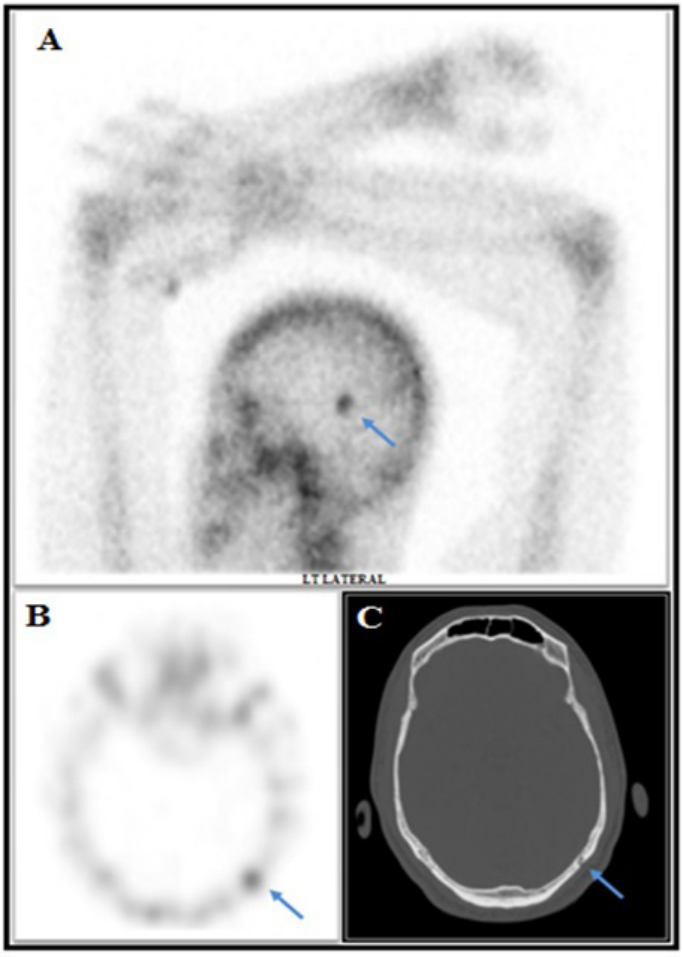

Figure 2: Lateral static skull image with focal radiotracer uptake in the left side (A). SPECT images of the skull with focal radiotracer uptake in the left occipital bone (B) (blue arrow). Axial bone widow of CT showing lytic lesions with sclerotic margin on the left occipital bone (C).

5. Discussion

Traditional medicine as defined by WHO is "the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness"[4]. It has been noted that 80% of population from the developing countries use such traditional services either for treatment, prevention of disease and or maintenance of good health [5]. The major areas of Arab traditional therapy are herbal, kaiy (also called Wasim) and cupping [6].

In the first case where the patient has used herbal medicine which is known to contain elemental mercury has shown a photon deficit area on the bone scan. Photon-deficient regions or cold areas on bone scanning have been reported in a variety of conditions. Reduction in the vascular transport of radionuclide to the bone structure as occurs in sickle cell sludging, trauma, infarction and tumor obstruction of the vascular supply-might result in the bone infarction of the affected region [7]. In view of sickle cell disease, the first differential diagnosis for photon deficient area is bone infract as infarction is a debilitating and significant complication of sickle cell disease and it may occur anywhere in the skeleton. But since the photon deficient area had moved upward from blood pool imaging to delayed imaging, bone infarct was not the main possibility and the SPECT-CT revealed heavy metal clumped in the large bowel loop overlapping the right side of the sacrum.

In the second case, the patient performed "kaiy" on the head few years back for chronic headache. The ancient Arabs had great faith in the therapeutic value of fire, applied in techniques such as "kaiy" and this technique became an Arabic tradition. Arab "Kaiy" therapists use metal rods, heated over a fire until red hot [6]. These are then placed on a specified skin location for a few seconds. The number of cauterizes in one session varies between one and seven and more [5]. This particular patient had the "kaiy" done one on his left side of the head which appears as hot spot on the bone scan many years later.

6. Conclusion

Many people in developing countries use alternative or traditional therapies before seeking medical advice [6]. Hence, we would like the emphasis the need of taking complete history from patients including if patient is taking any herbal medication and old trauma from any procedure done for pain relief in traditional way old or new. These cases also highlight the importance of the questioner / interview of the patients prior to bone scan and the clinical relevance of SPECT/CT imaging in differentiating uncommon artifacts.

References

1. Agrawal A, Purandare N, Shah S,Rangarajan V. Metastatic mimics on bone scan: “All that glitters is not metastatic”. Indian J Nucl Med 2016; 31: 185-90.
2. Guido M, Weiner, Lars Jenicke, VikaM. ller, Karl H. Bohuslavizki: Artifacts and non-osseous uptake in bone scintigraphy.Imaging reports of 20 cases. RadiolOncol. 2001; 35(3): 185-91.
3. Anish Bhattacharya, BhagwantRai Mittal, Vikas Prasad, Baljinder Singh. Tc99m MDP Bone Scan in Low Backache – is SPECT Necessary? IJNM. 2006; 21(1): 25-26.
4. Traditional Medicine: Definitions”. World Health Organization. 2008-12-01.
5. Mona Kamal Farid& Abdulla El-Mansoury. Kaiy (traditional cautery) in Benghazi, Libya: complications versus effectiveness. The Pan African Medical Journal – ISSN. 1937; 8688.
6. K-E A ABOU-ELHAMD: Kaiy as traditional therapy for pain: is it helpful or a myth? The Journal of Laryngology & Otology, 1 of 3.
7. Shiv M. Gupta, AnantapurPanduranga, Margaret Buckley, Thomas W. Crucitti, and Nilo E. Herrera: Significance of Photon-Deficient Areas in Radionuclide Bone Scans. J Nucl Med Technol. 1980; 8: 208-210.