



Bladder Hernia Mimicking Bone Metastasis: Case Report with Literature Review

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Abstract

Inguinal Bladder Hernia (IBH) is an infrequent clinical condition. The majority of reviewed cases in the literature with bladder hernias are asymptomatic and are usually diagnosed incidentally in imaging studies or during inguinal hernia repair. Few cases of bladder hernias detected during routine nuclear medicine studies have been reported in the literature, most of them concerning FDG PET scan. To the best of our knowledge, this is the third case identified in the English literature from incidental findings of IBH on bone scan.

Introduction

Reported first by Levine in 1951 as scrotal cystocele, Inguinal Bladder Hernia (IBH) is an infrequent clinical condition [1]. The majority of cases have no evident symptoms, but require pressure on the groin to aid urination, which make the preoperative diagnosis of IBH a real challenge [2]. The majority of reviewed cases in the literature with bladder hernias are asymptomatic and are usually diagnosed incidentally in imaging studies or during inguinal hernia repair [2-4]. Few cases of bladder hernias detected during routine nuclear medicine studies have been reported in the literature [5]. Prompt differentiation of this entity is important in such clinical situations as these can mimic bone metastasis in a bone scan or in an FDG PET scan [5]. The first case was reported in 2012, by Shagos et al. [5]. Ji et al. [2] presented in 2016, the second case of an incidental finding of IBH in a 99mTechnetium-Methylene Diphosphonate (99mTc-MDP) Single-Photon Emission Computed Tomography/Computed Tomography (SPECT/CT), for a 72-year-old gentleman with a history of prostate cancer with high prostate specific antigen levels and single uptake in the right inguinal region. To the best of our knowledge, this is the third case revealing IHD in a bone scan.

The present case report identified an incidental bladder hernia mimicking inguinal metastasis in a 90-year-old patient highly suspected for bone metastasis.

Case Presentation

A 90-year-old gentleman who presented with multiple bilateral large lung nodules in keeping with unknown malignant neoplastic process. For bone assessment, the patient underwent 99mTc-MDP SPECT/CT for examination of bone metastasis. Routine whole-body SPECT images were acquired between the top of the skull and the feet 120 min subsequent to an intravenous injection of 740 MBq 99mTc-MDP.

The whole-body images showed a focal intense MDP uptake in the right inguinal region, more observed on the anterior views, worrisome of metastatic bone lesion (Figure 1).

The SPECT-CT images of the pelvis showed the increased 99mTc-MDP uptake, which appeared separate from the main bladder activity in the trans-axial, coronal and sagittal SPECT images. The concurrent low dose CT of the same area indicated an inferior tongue-like extension of the bladder into the right inguinal region, which was diagnosed as an inguinal bladder hernia. Fused SPECT/CT axial images showed the circular accumulation of 99mTc-MDP in the medial right groin and the well-defined walls that connect the accumulation to the bladder (Figure 2). Ultimately, the patient was considered to free from osteoblastic bone metastases.

Discussion

Bladder hernia is an infrequent clinical condition in the clinic, occurring in less than 4% of all inguinal hernias [4,5]. The majority of patients with such disease are usually asymptomatic and are in the most of cases diagnosed incidentally in imaging studies or during inguinal hernia repair [2-5]. Few cases of bladder hernias detected during routine nuclear medicine studies have been reported in

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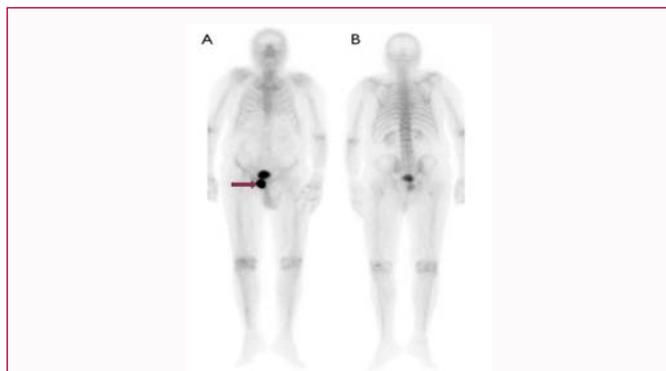


Figure 1: Whole-body sweep images showed focal intense methylene diphosphonate uptake (arrow) in the right inguinal region seen on the anterior view (A), but not on the posterior view (B), which was suspected to be a metastatic lesion.

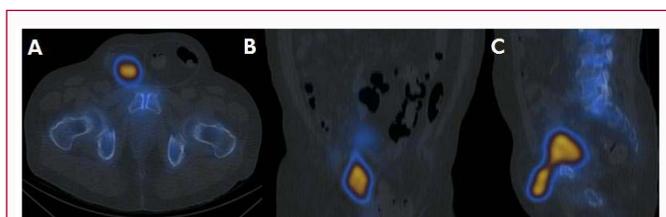


Figure 2: Trans axial (A), coronal (B), sagittal (C) Fused SPECT-CT images revealed increased ^{99m}Tc -MDP uptake in the right inguinal region, which appears separate from the main bladder activity.

the literature [5]. Prompt differentiation of this entity is important in such clinical situations as these can mimic bone metastasis in a bone scan or in an FDG PET scan [5]. There are only two case detected in ^{99m}Tc -MDP SPECT/CT bone scan, reported respectively in 2012 and 2016 [2,5].

In fact, many unexpected extraosseous soft-tissue uptake has been observed on bone scintigraphy since its introduction in the 1970s [6-8]. It is imperative that the interpreting physician make proper analysis, and reporting of these extraosseous findings, because they may alert the referring physician to previously undetected disease processes [9,10].

However, the planar imaging of extraosseous radiotracer uptake is limited by a lack of anatomic correlation and localization, as in our case, and it usually not easy to define that uptake as extra-osseous based only on 2D images [11]. To be more confident, the SPECT provides 3D information regarding the depth and spatial location of the activity [11]. Hybrid SPECT/CT adds precious anatomy localization when applied to ^{99m}Tc -MDP bone scans. Fused images have a powerful diagnostic tool that improves diagnostic interpretation [11]. The combination of functional images proved by the SPECT with detailed anatomic provide by the concurrent low dose CT allows precise localization of the abnormal uptake and can improve specificity by distinguishing benign from malignant osseous lesions [12-14].

Conclusion

The present study re-demonstrates that Hybrid SPECT/CT applied to bone scintigraphy allows precise anatomy localization and confirmation of radioactivity in unexpected bio-distributions within unexpected organ structures, aiding confident diagnostic interpretation. When planar imaging combined with clinical history is non-diagnostic, either SPECT with correlative cross-sectional imaging or SPECT/CT can often add precious value and lead to a specific diagnosis. The combination of the functional and the anatomical tools has an emerging role in the best characterization of any radioactivity when deployed in a problem-solving capacity.

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