Bladder hernia in the inguinal canal mimicking pubic metastasis on [^{99m}Tc]Tc-MDP and [^{99m}Tc]Tc-HYNIC-PSMA whole body scans

Case Report

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ABSTRACT

A 73 y/o male with first presentation of urinary retention from two months ago referred to our department by an urologist for prostate cancer staging. The patient had gleason score of 5+4 and total PSA of 79. He underwent [^{99m}Tc]Tc-MDP and [^{99m}Tc]Tc-HYNIC-PSMA scans on two different days. The bone study revealed diffuse uptake in sacrum and a focus of abnormal [^{99m}Tc]Tc-MDP activity in the right SI joint. Another focus was also noted in right pubic region best seen on anterior projection which later on SPECT/CT was confined to a bladder diverticulum with tracer accumulation protruding into the right inguinal canal forming a hernial sac. Following a few days, [^{99m}Tc]Tc-HYNIC-PSMA scan was carried out and depicted high uptake in sacrum and right pubic region as well. The uptake was again localized to the bladder hernia on dedicated SPECT/CT acquisition. The findings denotes an important differential diagnosis of the pubic metastases as well as added value of SPECT/CT imaging in aforementioned scans.

Key words: [^{99m}Tc]Tc-MDP; [^{99m}Tc]Tc-HYNIC-PSMA; Bladder hernia; Prostate cancer

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INTRODUCTION

Bladder diverticulum is common in urological investigators, however in clinical practice it's herniation to inguinal canal is asymptomatic and mostly diagnosed incidentally during imaging or surgical repairs [1]. Bladder hernia is accounted for up to four percent of the cases with inguinal hernia [2]. Several imaging modalities have reported this anomaly in ultrasonography, computed tomography, positron emission tomography and SPECT imaging [1-5]. To the best of our knowledge, no study has yet reported a bladder originated inguinal hernia identified in two different modalities on the same time. Here, we report an interesting case of bladder hernia and describe the findings observed by [^{99m}Tc]Tc-MDP and [^{99m}Tc]Tc-HYNIC-PSMA as well as the prime role of SPECT-CT to correctly diagnose with this abnormality.

CASE PRESENTATION

A 73 y/o male with new onset urinary retention of two months duration, referred to our department by an urologist for prostate cancer staging. The Gleason score and total PSA were 5+4 and of 79, respectively. [^{99m}Tc]Tc-MDP and [^{99m}Tc]Tc-HYNIC-PSMA scans were scheduled and undertaken on two days apart (Figures 1 and 2).

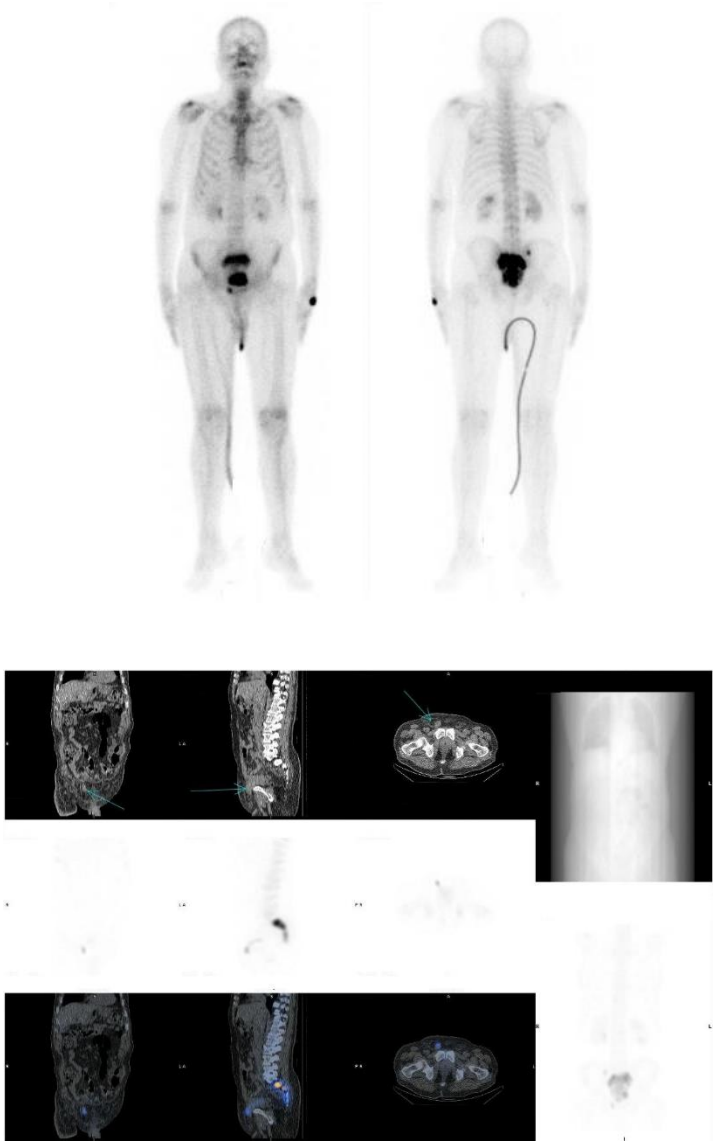

Fig 1. After IV administration of 740 MBq (20 mCi) of [^{99m}Tc]Tc-MDP, whole body and SPECT/CT images from the thoraco-abdominopelvic region was performed three hours later by dual-head variable angle gamma camera (E.CAM, GE healthcare) with LEHR collimator (using Tc-99m photopeak with 20% window). The images demonstrated a focal zone of activity in the right pubic region which was compatible with bladder hernia in right inguinal canal on CT slices (arrows). Planar and SPECT/CT views are shown.

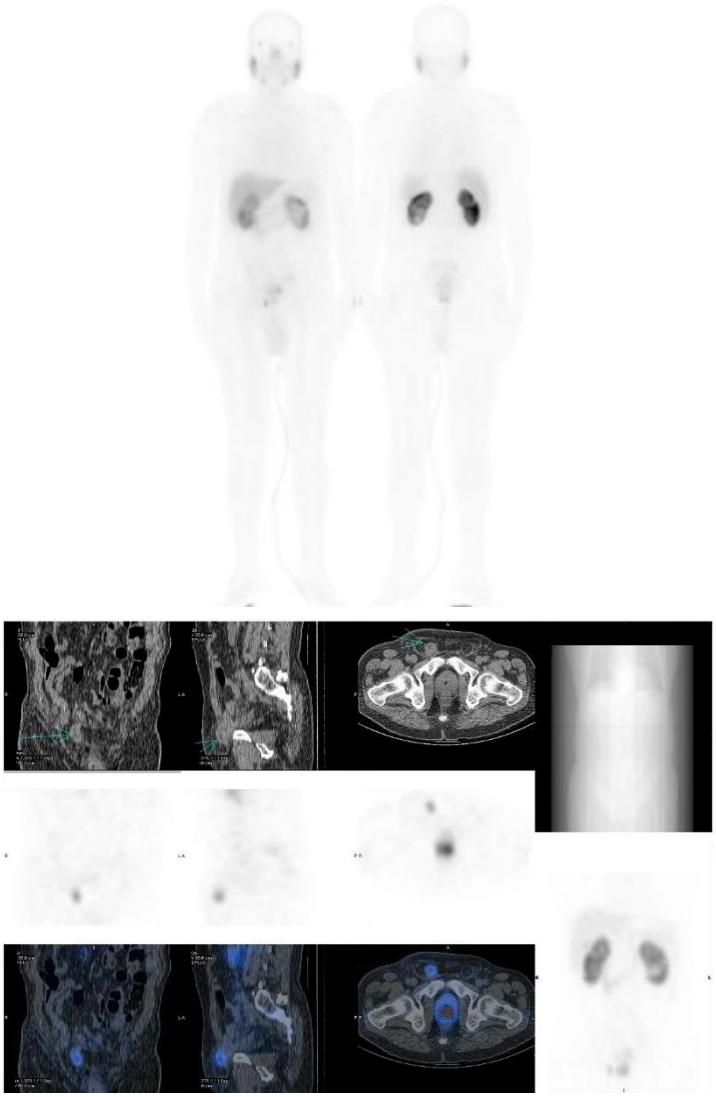

Fig 2. The same protocol for acquisition was followed four hours after IV injection of 740 MBq (20 mCi) of [^{99m}Tc]Tc-HYNIC-PSMA for further evaluation. The same pattern simulated pubic metastasis. Planar and SPECT/CT views are shown.

Foci of diffuse uptake in sacrum and the right SI joint were noted on [^{99m}Tc]Tc-MDP scan. Another focus was also appreciated in right pubic region best seen on anterior projection which later on SPECT/CT was confined to a bladder diverticulum with tracer accumulation protruding into the right inguinal canal forming a hernial sac. The following days, [^{99m}Tc]Tc-HYNIC-PSMA scan was carried out and depicted high uptake in sacrum and right pubic region as well. The uptake was again localized to the bladder hernia on dedicated SPECT/CT acquisition. The findings denotes an important differential diagnosis of the pubic metastases as well as added value of SPECT/CT imaging in aforementioned scans.

DISCUSSION

Bladder diverticulum is a common urologic findings and its prevalence may reach to 31.6% in men [6]. High clinical suspicion must be paid to elderly, male and obese patients, however, solely 7% of bladder hernias are diagnosed preoperatively [7], so facing this anomaly especially in prostate cancer patients seems unavoidable. Diversity in diverticulum position can be falsely contributed to different pelvic metastasis such as pubis [8], SI joint [9] on bone scan, [68Ga]Ga-PSMA-11 PET/CT [10] or 2-[18F]FDG PET/CT [11-12] even mimicking a pelvic [13] or abdominal [14] metastasis or a soft tissue mass [15]. Normal bio-distributions of tracers leads to tracer accumulation within bladder in which unexpected bladder diverticulum leads to false confirmation of radioactivity in near structures The simplest method to rule out osseous metastasis is acquisition of a lateral view on bone scan. In this case we also carried out [^{99m}Tc]Tc-HYNIC-PSMA scan in which the lateral view did not help. This is probably where the SPECT/CT imaging is next best step to prevent false

positive findings. Hybrid SPECT/CT reemphasizes the precise anatomy localization in structures and consequently confident diagnostic interpretation.

CONCLUSION

Our findings denotes an important and not uncommon finding which can mimic pubic metastases and highlights added value of SPECT/CT imaging in aforementioned scans.

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