Interesting Image
Mol Imaging Radionucl Ther 2023;32:171-174 DOI:10.4274/mirt.galenos.2023.27037

Urinary Bladder Carcinoma Demonstrated on Bone Scintigraphy and SPECT/CT Images

Kemik Sintigrafisi ve SPECT/BT ile Gösterilen Üriner Mesane Karsinomu

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Abstract

Bone scintigraphy with Tc-99m-diphosphonate analogs are widely used in staging, restaging, and monitoring the therapy effectiveness of various cancer types. Bone-seeking agents are excreted through urination, resulting in the visualization of either anatomical abnormalities or pathological conditions of the kidneys and bladder. We present a case of a 63-year-old man with urinary bladder carcinoma depicted on whole body planar and single-photon emission computed tomography/computed tomography images.

Keywords: Bone scintigraphy, SPECT/CT, urinary bladder carcinoma, nuclear medicine

Öz

Tc-99m-difosfonat analogları ile kemik sintigrafisi, çeşitli kanser türlerinin evrelemesinde, yeniden evrelemesinde ve tedavi etkinliğinin izlenmesinde yaygın olarak kullanılmaktadır. Kemik arayan ajanlar idrar yoluyla atılır, bu da böbreklerin ve mesanenin anatomik anormalliklerin ya da patolojik durumlarının görselleştirilmesini sağlar. Bu yazıda, mesane karsinomu tüm vücut düzlemsel ve tek foton emisyonlu bilgisayarlı tomografi/bilgisayarlı tomografi ile gösterilen 63 yaşında bir erkek hastayı sunuyoruz.

Anahtar kelimeler: Kemik sintigrafisi, SPECT/BT, mesane karsinomu, nükleer tıp

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Received: 20.09.2022 **Accepted:** 08.01.2023

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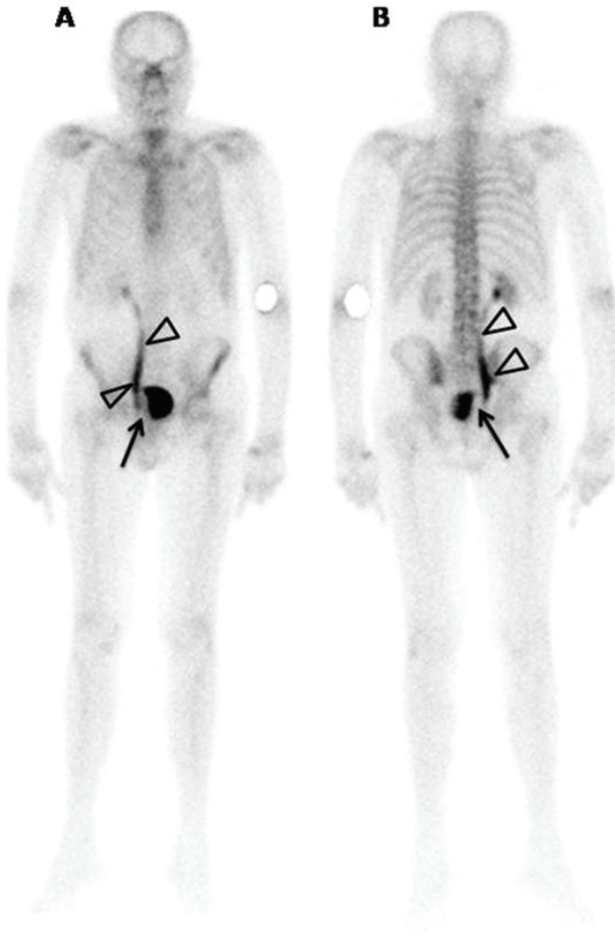


Figure 1. A 63-year-old man was admitted to the urology department of our hospital due to recent macroscopic hematuria and extremely low hematocrit levels. From his past medical history, he had been diagnosed with non-invasive urothelial carcinoma (high grade) seven years ago, for which he underwent transurethral resection with complementary Bacillus Calmette-Guerin intravesical therapy. Few weeks before his admission, he underwent routine cystoscopy in an outside facility, and he was informed that it showed urothelial papillomas, but he denied any therapeutic intervention at that time. Because of his prior history of urothelial carcinoma, an abdomen-pelvis computed tomography (CT) examination and bone scintigraphy was ordered. A whole-body scan was obtained 2 h after intravenous administration of 20 mCi (740 Mbq) Tc-99m methyl diphosphonate. Anterior (A) and posterior (B) images showed mild inhomogeneous radiopharmaceutical uptake in the lumbar spine, without having the typical appearance of osteoblastic metastatic osseous lesions. Moderately increased tracer accumulation was also observed in the cervical spine and joints of upper extremities, related to degenerative disorders. In the pelvic region, a cold photopenic area occupying the right portion of the urinary bladder was noticed (arrow). Additionally, dilatation and tracer retention was demonstrated in the right ureter, especially in the lower third (arrowheads).

Urinary tract abnormalities, such as filling defects of the urinary bladder, related to the presence of either intrinsic or extrinsic lesions have been previously reported on bone scintigrams. De Geeter and Goethals (1) in 2010 described three cases with similar appearance of the urinary bladder owing to carcinomas. Contrary to the above-mentioned reports, there are examples with intense tracer accumulation of urothelial carcinomas, pertained to tumor calcification (2,3). A case of complete absence of urinary bladder visualization caused by obstruction has also been mentioned (4). In male patients, regions with decreased tracer accumulation at the base of the urinary bladder, known as "inverted cups", have been attributed to prostate enlargement and surgical resection (5). Clots, hematomas, and ureterocele are some other possible explanations of cold lesions inside the bladder (6,7). Pelvic masses, such as colon tumors, can lead to the bladder defect formation by exerting external pressure (7,8). To ascertain the origin of our findings, a pelvic single-photon emission computed tomography (SPECT)/CT examination was performed.



Figure 2. On coronal SPECT images (A), a photopenic region, possessing part of the right side of the urinary bladder (orange arrows), with concomitant ureteral dilatation and tracer retention, especially in the lower third, was observed (black arrow). Additionally, a smaller cold region was depicted on the left part of the bladder (green arrow). The concurrent low-dose CT images (B) indicated an inhomogeneous appearance of the urinary bladder with the presence of large, hyperdense lesions on the left and right portion involving the right vesico-ureteral junction. Fused SPECT/CT images (C) revealed that our findings in the urinary tract system, as shown on bone scan, were caused by the existence of urinary bladder neoplasms (red arrows).



Figure 3. Furthermore, comparison with the enhanced coronal CT images confirmed the findings of fused SPECT/CT images (orange arrows). Conclusively, urinary tract abnormalities are an unexpected but possibly finding on bone scintigrams. Hybrid SPECT/CT technology providing additional anatomical information, represents a powerful tool in the correct and precise diagnostic interpretation of extraosseous findings on bone scintigraphy.

Ethics

Informed Consent: Written informed consent was obtained.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: S.A., X.X., P.R., D.B., Concept: S.A., C.S., Design: S.A., C.S., Data Collection or Processing: P.R., D.B., Analysis or Interpretation: X.X., C.S., Literature Search: S.A., C.S., Writing: S.A., C.S.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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