Interesting image

Diagnostic dilemma of urinary leak vs. perirenal abscess on skeletal scintigraphy: The added value of SPECT/CT and renal scintigraphy

Dilema de diagnóstico de fuga urinaria versus absceso perirrenal en la gammagrafía esquelética: el valor añadido de SPECT/TC y gammagrafía renal

T.K. Jain a, R.K. Basher a,∗, B.R. Mittal a, A. Bhatia b, S.K. Singh c, A. Bhattcharya a

a Department of Nuclear Medicine, PGIMER, Chandigarh 160012, India
b Department of Radiodiagnosis, PGIMER, Chandigarh 160012, India
c Department of Urology, PGIMER, Chandigarh 160012, India

A 60-year-old male patient with prostate carcinoma was subjected to 99mTc-methylene diphosphonate (MDP) skeletal scintigraphy to assess for whole body skeletal metastasis before surgery. Patient also had a severe left flank pain along with fever and increased white blood cell count since 20 days. After three hours of intravenous injection of 740 MBq of 99mTc-MDP, whole body bone scan was acquired in anterior and posterior views (Fig. 1a and b) that showed normal physiological tracer uptake in whole skeleton except oblique linear increased tracer uptake (arrow) in the left lower abdomen. SPECT/CT images (c–f) revealed a tracer avid well defined thick walled lesion in posterior peri-renal space, enclosed by Zuckerkandl’s fascia. After clinical and scintigraphic correlation, this was considered to be peri-renal abscess. To rule out renal pathology, 99mTc-EC(ethylenedicysteine) renal dynamic scintigraphy also performed. After combined intravenous injection of 180 MBq 99mTcLLEC and 40 mg frusemide, sequential flow, uptake and delayed images were acquired. The scintigraphic images (a–e) revealed normal functioning of both kidneys with nonobstructive

Fig. 1. A 60-year-old male skeletal scintigraphy images (a) anterior and (b) posterior showed normal physiological tracer uptake in whole skeleton except oblique linear increased tracer uptake (arrow) in the left lower abdomen giving appearance of left ureteric leak. SPECT/CT images transaxial (c, d) and coronal (e, f) revealed a well defined mass of low attenuation with a thick, irregular wall in posterior left peri-renal space, enclosed by Zuckerkandl’s fascia showing increased tracer uptake (arrow).

* Corresponding author.
E-mail address: drrajender2010@gmail.com (R.K. Basher).

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drainage. There was no tracer activity collection in left renal fossa during the entire study. The final impression of bone scan using SPECT/CT was left perirenal abscess with no definite scan evidence of skeletal metastasis. Patient had undergone ultrasound guided aspiration followed by culture sensitivity examination of left perirenal collection. The culture examination was positive for Escherichia coli. Patient also received three weeks antibiotic course and improved symptomatically. $^{99m}$Tc-MDP skeletal scintigraphy is commonly performed for detection of altered skeleton metabolism. $^{99m}$Tc-MDP is predominantly excreted by the kidney with half life of 3–4 min in normal renal function. About 78% of injected dose freely diffuses out from vascular compartment to extracellular spaces. There is expansion of extracellular fluid due to any pathology causing altered tracer dynamics resulting in increased $^{99m}$Tc-MDP tracer uptake. Abscess in early stage is a combined process of plasma exudation with leukocytes infiltration in surrounding tissue so hyperemia and local edema at the periphery of the abscess are responsible for the enhanced diffusion and retention of $^{99m}$Tc-MDP. Chronic abscess commonly has calcification in the necrotic or proliferating fibrous tissue results in $^{99m}$Tc-MDP deposition. In our case, the appearance of radiotracer ($^{99m}$Tc-MDP) in the left perirenal abscess mimicked upper ureteric leak on planar bone scan. To rule out ureteric leak, which may be a sequel of distal obstruction, renal dynamic scintigraphy is commonly used to confirm the fluid collection to be urinoma as a collection of tracer activity. In our case, renal dynamic scintigraphy did not reveal abnormal tracer activity in renal fossa till three hour delayed images (Fig. 2).

The final impression was left perirenal abscess with no definite scan evidence of skeletal metastasis. Therefore, present case highlights the combined utility of SPECT/CT and renal dynamic scan to confirm the abnormal tracer activity in renal fossa in bone scan.

![Fig. 2.](image) To rule out renal pathology $^{99m}$Tc-EC(ethylene dicysteine) renal dynamic scintigraphy images flow (a). uptake (b), pre and post void (c, d) and delayed (e) revealed normal flow of both kidneys with preserved cortical tracer uptake. Minimal pooling of tracer activity was noted in bilateral renal pelvis in dynamic images which cleared adequately in post void images. No significant tracer collection was noted in bilateral renal fossa in delayed three hours images.
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References

