

## Hybrid SPECT/CT as a diagnostic modality in suspected urinoma with ambiguous planar Tc99m EC renal scintigraphy

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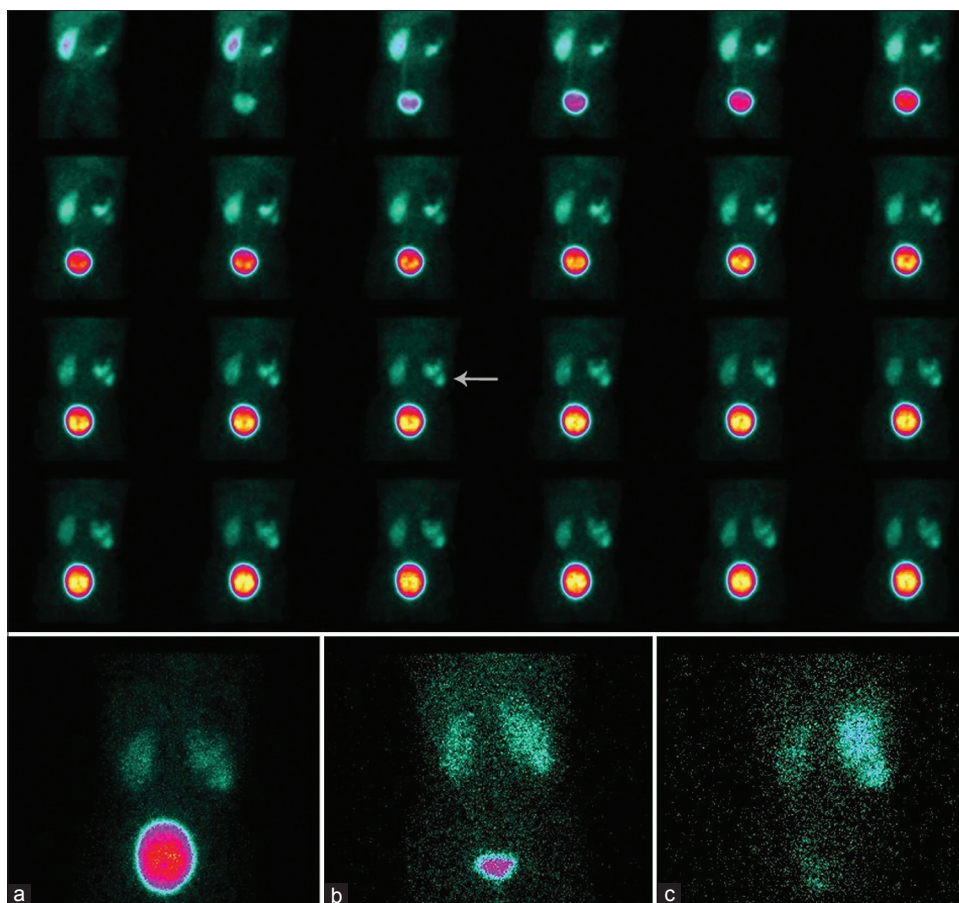
We report a case of urinary leak where planar renal scintigraphy was inconclusive, but hybrid SPECT/CT helped in accurate diagnoses. An 8-year-old female child presented to the urology department with a history of left flank pain over 3 months. Ultrasonography (USG) and intravenous pyelography (IVP) were suggestive of pelvi-ureteric junction obstruction (PUJO). Tc-99m ethylenedicysteine (EC) scan findings were also consistent with PUJO. Subsequently, the child underwent modified Anderson-Hynes pyeloplasty on left side. She remained asymptomatic for 1 month after which she started having dull boring pain in the left flank and painful micturition. Biochemical investigations revealed normal level of blood urea nitrogen, serum creatinine, and electrolytes. Urine culture was sterile. The abdominal USG showed a large cystic collection in relation to the moderately hydronephrotic left kidney with normal right kidney. Subsequently Tc-99m EC renal scintigraphy performed in anterior projection showed a large photopenic area in the upper half of left kidney with good tracer uptake in lower part during the dynamic phase of the study. The photopenic area showed gradual accumulation of tracer [Figure 1] suggesting left kidney hydronephrosis. Another focus of tracer uptake was seen inferolateral to the left kidney which gradually increased in size till the end of the study. However, whether this tracer accumulation was part of the hydronephrotic kidney or extrarenal collection could not be confirmed. Subsequently, the patient underwent hybrid SPECT/CT imaging [Figure 2] which localized the second focus of tracer uptake to an abnormal extrarenal collection inferolateral to the lower pole of the kidney communicating with the left kidney. Based on these findings a diagnosis of urinoma was made.

Urinoma is a collection of extravasated urine in the abdomen or pelvis resulting from disruption of the urinary collecting system at any level from the calyx to the urethra. Injuries to the collecting system is the most frequent cause and can be either traumatic or

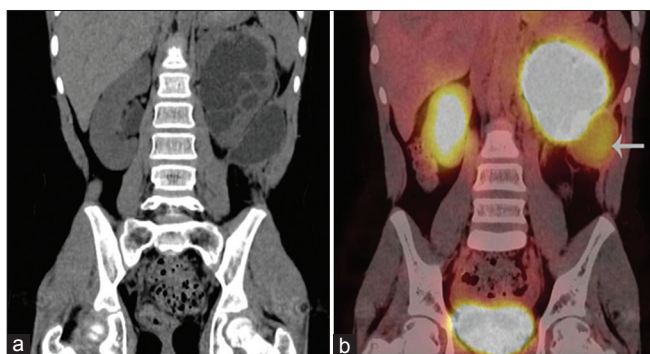
rarely iatrogenic during surgical or percutaneous procedures, for example, pyelolithotomy, pyeloplasty, ureterolithotomy, vaginal or abdominal hysterectomy, rectal dissection, or percutaneous urological interventional procedures.<sup>[1]</sup> Though rare, they may occur spontaneously due to a distal obstruction, for example, a ureteric calculus<sup>[2]</sup> or a papilloma of the renal pelvis<sup>[3,4]</sup> causing forniceal rupture. Anatomical imaging, such as CT and USG, has a limited role in ascertaining the origin and nature of fluid collections in the abdomen and pelvis.<sup>[5]</sup> Scintigraphy with Tc99m diethylene-triamine-pentaacetate (DTPA) or other renal agents can be used to confirm the fluid collection to be urinoma.<sup>[6,7]</sup> Special situations where scintigraphy are of great help are in patients who cannot receive intravenous contrast material due to increased serum creatinine level, patient allergic to the contrast material, and have received a renal transplant. Moreover, IVP is relatively insensitive in the diagnosis of renal injuries and urine leaks and may demonstrate normal findings in over 30% of cases of significant renal injury.<sup>[8]</sup> It also has disadvantages of high radiation exposure and cannot be performed in patients with impaired renal functions. Though renal dynamic scintigraphy has been widely used in detecting urinary leaks and urinoma, planar imaging may show equivocal results further adding to the confusion like in the present case. SPECT/CT may be more useful in exact localization of such collections.<sup>[9]</sup> In the present case, SPECT/CT was helpful in the diagnosis of the urinoma and differentiating hydronephrotic component of the kidney from the urinoma. It also served the purpose of establishing the site of the urine leak and provided the dimensions of the urinoma, which helped in planning further surgical management.

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**Figure 1:** Tc99m ethylenediacysteine dynamic renal scintigraphy in anterior projection showing a focus of abnormal tracer activity in the region of lower pole of the left kidney (arrow head); (a) pre-void, (b) post-void, and (c) delayed static image at 3 h show persistence of the tracer activity near the lower pole of the left kidney



**Figure 2:** Coronal projections (a) computed tomography (CT) image showing abnormal fluid collection near the lower pole of the left kidney, (b) Hybrid single-photon emission CT (SPECT)/CT showing tracer accumulation in the collection (arrow head) suggesting urinoma

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