The value of $^{99m}$Tc-DTPA renal scintigraphy in the evaluation of post-traumatic abdominal fluid collection

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A patient with a post-traumatic retroperitoneal urinoma is presented. On admission, there was a clinical suspicion of retroperitoneal hematoma and ultrasonography (US) was performed which showed a hypoechogenic fluid collection suggesting retroperitoneal hematoma. In order to determine the nature of the fluid, radionuclide angiography and renal scan were performed successively with $^{99m}$Tc-DTPA. Demonstration of urinary leakage into the mass in the delayed renal scintigraphic images suggested a urinoma. At laparotomy, total transection of the left ureter in the uretero-pelvic region was found and the diagnosis of urinoma was confirmed.

Key words: post-traumatic abdominal fluid collections, $^{99m}$Tc-DTPA renal scintigraphy, ultrasonography

INTRODUCTION

Differential diagnosis of post-traumatic abdominal fluid collection is important for the selection of appropriate therapy. Although computerized tomography (CT) and US can detect abdominal fluid collection, it is not always easy to establish the nature of the fluid by using these techniques. However, $^{99m}$Tc-DTPA renal scintigraphy may be a useful diagnostic test in cases in which urinoma is suspected.1,2 This is shown especially in transplant patients having postoperative fluid collection.

This case report was presented to show the diagnostic value of radionuclide techniques in the differential diagnosis of posttraumatic abdominal fluid collection.

CASE REPORT

A 42-year-old male patient who had a traffic accident 1.5 months previously, was referred to our hospital with a suspected diagnosis of retroperitoneal hematoma. The chest radiograph showed a homogenous density in the left 1/2 lower lung field without a parabolic upper contour (Fig. 1). The abdominal ultrasound showed a massive retroperitoneal hypoechogenic lesion, displacing the left kidney and the spleen (Fig. 2) which was suggestive of retroperitoneal hematoma. A radionuclide abdominal angiography was ordered to rule out vascular leakage. Radionuclide angiography was performed with $^{99m}$Tc-DTPA, in order to determine whether the hypoechogenic mass represents a hematoma or an urinoma. After an intravenous bolus injection of 370 MBq $^{99m}$Tc-DTPA, serial dynamic anterior view images (1 frame/second) are obtained for 64 seconds with a Toshiba GCA-501S gamma camera, and no vascular leakage was found (Fig. 3). However, anterior and downward displacement of the spleen was evident. The perfusion of the right kidney was normal, but the left kidney could not be evaluated because of the superposition of the splenic activity. There was a photon deficient area surrounding the splenic activity extending to the thorax. Static renal images (Fig. 4) showed that the left kidney had lost its normal size and anatomic appearance. Abnormal accumulation of the radiotracer gradually increased below the left kidney in 14 and 19 minute frames,

Received December 2, 1991, revision accepted March 23, 1992.

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suggestive of urinary leakage. A Delayed image at 1 hour (Fig. 5) showed diffuse accumulation of radioactivity into the large hypoactive area. This finding indicated that the mass was an urinoma. At laparotomy total transection of the left ureter was found in the ureteropelvic region. The left retroperitoneal mass which had displaced the spleen anteriorly and the left diaphragm upwards proved to be a urinoma containing 3,000 ml of urine.

DISCUSSION

Urinomas are encapsulated collections of urine.\textsuperscript{9} Frequently they result from an abdominal trauma, but they may occur iatrogenically or, rarely spontaneously.\textsuperscript{4,5} Usually urinomas occur about one month after an abdominal trauma caused by striking with or bumping against a blunt object. In our case, the urinoma was detected 1.5 months after the trauma. Urinomas are usually localized in the perirenal and pararenal regions. When located perirenally, its shape is globular, but urinomas located in the anterior or posterior pararenal region show a tendency to extend either cranially or caudally. In our case, the urinoma was located in the posterior pararenal region and extended into the thorax. When untreated, urinomas can cause complications such as perinephric abscess, local retroperitoneal fibrosis, hypertension and hydronephrosis. Although percutaneous drainage is a satisfactory treatment in patients without obstructive uropathy or renal dysfunction, nephrectomy may be necessary in cases whose ipsilateral renal function is significantly reduced.

Differentiation of posttraumatic abdominal fluid collection is important for selecting appropriate therapy. Abdominal US and CT are important radiologic techniques in the diagnosis of abdominal fluid collection, but it is not always possible to suggest the content of the fluid collections since hematomas, urinomas and lymphoceles usually have nonpathognomonic patterns. It has been shown that radionuclide techniques are especially useful in the differential diagnosis of abdominal fluid collections which occur after renal transplantation.\textsuperscript{7,8} These
Fig. 4 Posterior renal images show small and displaced left kidney and an abnormal accumulation of radioactivity (arrow) suggestive of urinary leakage.

Fig. 5 Delayed image at 1 hour indicates a urinoma (small arrow heads) and impairment of left renal (arrow) function.

Techniques might also be useful in the differential diagnosis of posttraumatic abdominal fluid collection. With the help of renal scintigraphy, it may be possible to differentiate a urinoma from a hematoma and to evaluate the function of the kidney at the same time.

This case report illustrates the value of noninvasive radionuclide renal scintigraphy after blunt abdominal trauma in the evaluation of pararenal abdominal fluid collection together with the assessment of renal function.

REFERENCES


