

# Intraperitoneal Leakage of Technetium-99m-DTPA Following Renal Transplantation: A Sign of Chylous Ascites

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A 7-yr-old girl developed persistent ascites following renal transplantation. **Methods:** Renal scintigraphy periodically performed to monitor renal function of the transplanted kidney showed increased  $^{99m}\text{Tc}$ -DTPA in the abdominal cavity on delayed imaging. **Results:** Paracentesis demonstrated a cloudy yellow, odorless fluid which was identified as chylous ascites, an extremely rare complication of abdominal vascular surgery. **Conclusion:** Technetium-99m-DTPA in the peritoneal cavity following renal transplantation should be recognized as a sign suggestive of chylous ascites.

**Key Words:** technetium-99m-DTPA; renal transplant; chylous ascites

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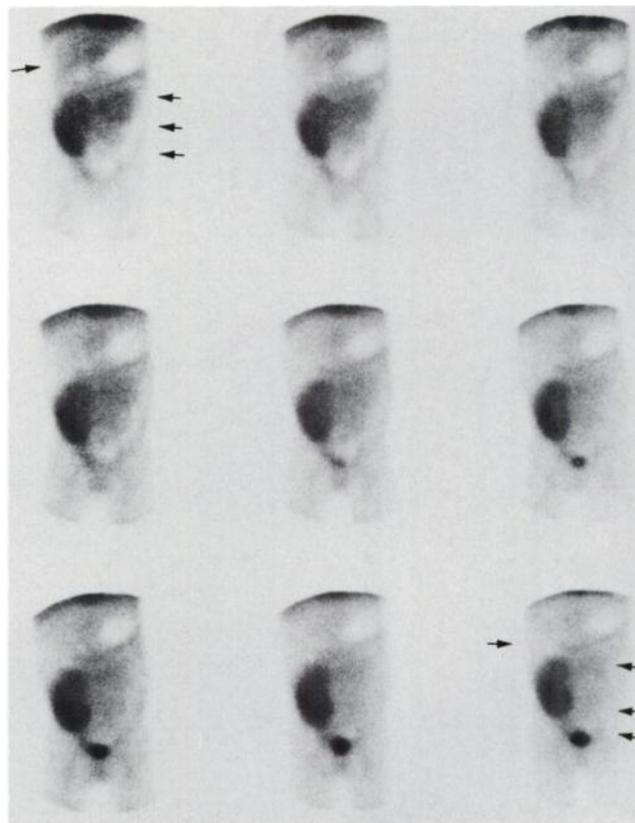
**C**omplications of renal transplantation include surgery-related defects such as insufficient vascular anastomosis, urinary leakage and lymphocele, usually occurring in the early postoperative period. Radionuclide studies are useful in monitoring renal function of transplanted kidney as well as identifying these complications (1,2). This manuscript reports the scintigraphic findings in a patient with chylous ascites following renal transplantation.

## CASE REPORT

A 7-yr-old girl underwent transplantation with a kidney from a live related donor (mother). The renal artery was directly anastomosed side-to-end to the inferior portion of the abdominal aorta and the renal vein was anastomosed to the iliac vein. Following surgery, the patient developed atelectasis of the left lung and congestive heart failure. On the seventh postoperative day, the patient developed a mild fever, leukocytosis and oliguria. Acute rejection was diagnosed based upon clinical symptoms and laboratory results, although clinical complications improved with conservative therapy. Subsequently, ascites were observed.

Renal scintigraphy using  $^{99m}\text{Tc}$ -DTPA was performed periodically to evaluate renal function in the transplanted kidney. The

kidney maintained good function immediately post-op until symptoms and signs of rejection occurred. The scintigrams showed a halo of activity in the left inferolateral region and the right subphrenic region in the abdomen on the eighth postoperative day which persisted and became worse on follow-up images. These photon deficient areas faded to obscurity and finally became equal to surrounding background radioactivity with time (Fig. 1). A delayed image at 3 hr postinjection demonstrated  $^{99m}\text{Tc}$ -DTPA in the peritoneal cavity (Fig. 2). This was considered most likely to be due to urinary leakage although other etiologies such as extravasation of blood were considered. Retrograde cystography showed no contrast leakage through the bladder and ureter. Technetium-99m human serum albumin (HSA) scintigraphy was per-



**FIGURE 1.** Sequential scintigrams obtained on the 15th postoperative day. Photon defect areas in the abdomen are filled with radioactivity.

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**FIGURE 2.** A delayed image 3 hr after injection showed radioactive collection in regions corresponding to halo areas demonstrated in Figure 1.



formed to identify whether the ascites were due to plasma extravasation. This study showed peritoneal activity persisting to the 24-hr post-injection image (Fig. 3).

Paracentesis demonstrated a cloudy yellow, odorless fluid. Laboratory examination of the fluid revealed a total protein of 3.6 mg/dl, BUN of 45 mg/dl and creatinine of 0.9 mg/dl. Cytology showed a 40–50 RBC/field and 5–10 WBC/field and there were no bacteria. Therefore, a diagnosis of chylous ascites was made. Twenty days following the operation ascites decreased with conservative treatment. The patient was discharged 30 days after the operation.

## DISCUSSION

Chylous ascites is an extremely rare clinical condition infrequently encountered following abdominal surgery of vascular reconstruction (3–6) and during CAPD (7). Because chylous ascites is uncommon and usually subclini-

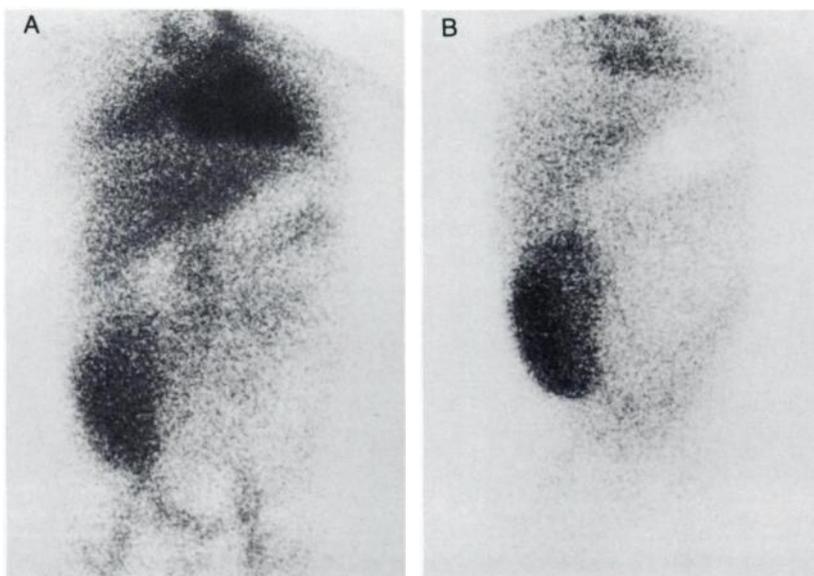
cal, its prevalence and etiology are difficult to define (8). In this case, chylous ascites were related to the extraordinary surgical manipulation to the abdominal aorta.

Although  $^{99m}\text{Tc}$ -DTPA accumulates in some pathological situations outside the genitourinary system (9), it is not usually encountered in ascites. The scintigraphic findings of halolike distribution filled over time (1). Technetium-99m-HSA demonstrated that this was due to transudation of circulating plasma components. If chylous ascites had been suspected, radionuclide lymphoscintigraphy might have provided definitive information (10,11). Diagnosis was eventually made based upon examination of the ascites fluid.

Leakage of  $^{99m}\text{Tc}$ -DTPA into the intraperitoneal cavity may be a sign suggestive of chylous ascites and should be considered a possible diagnosis in patients undergoing renal transplantation requiring extraordinary surgical manipulation to the abdominal aorta.

## REFERENCES

1. Kirchner PT, Rosenthal L. Renal transplant evaluation. *Semin Nucl Med* 1982;12:370–378.
2. Dubovsky EV, Russel CD. Radionuclide evaluation of renal transplants. *Semin Nucl Med* 1988;18:188–198.
3. Bradham RR, Gregone HS, Wilson R. Chylous acites following resection of an abdominal aortic aneurysm. *Am Surgeon* 1970;30:238–240.
4. Williamson C, Provam JL. Chylous ascites following aortic surgery. *Br J Surg* 1987;74:71–72.
5. Williams RA, Vetto J, Quinones BW, Bongard FS, Wilson SE. Chylous ascites following abdominal aortic surgery. *Ann Vasc Surg* 1991;5:247–252.
6. Ablan AJ, Littoy FN, Freeark RJ. Postoperative chylous ascites: diagnosis and treatment. *Arch Surg* 1990;125:270–273.
7. Porter J, Wand WN, Oliveira DB. Chylous ascites and continuous ambulatory dialysis. *Nephrol Dial Transplant* 1991;6:659–661.
8. Browse NL, Wilson NM, Russo F, Al-Hassan H, Allen DR. Aetiology and treatment of chylous ascites. *Br J Surg* 1992;79:1145–1150.
9. Datz FL, ed. *Gamuts in nuclear medicine*, 2nd edition. Norwalk, CT; Appleton & Lange: 1987:279.
10. Baulieu F, Baulieu JL, Alison D, Barsotti J, Itti R. Use of lymphoscintigraphy in traumatic chylous ascites. *Lymphology* 1987;20:93–95.
11. Gregg DC, Wells RG, Sty JR. Lymphoscintigraphy. Chylous ascites and lymphocele demonstration. *Clinic Nucl Med* 1988;13:300.



**FIGURE 3.** Scintigrams with  $^{99m}\text{Tc}$ -HSA at 5.5-hr (A) and 24-hr (B) postinjection. Increased radioactivity is observed in the 24-hr postinjection image in the same regions seen in Figure 2.