TABLE 2. SERUM UIBC VALUES FOR FEMALE AND MALE C_3H MICE

	N	UIBC values* μg/dl ± s.d.
Female	38	172 ± 89.6
Male	14	252 ± 29.8

* Statistically significant, $p < 0.05$, Student's t-test.

diation) cause increased urinary excretion of gallium and decreased tumor uptake (5). Any decrease in the number of available serum iron-binding sites for gallium could likewise result in decreased levels of gallium in blood and greater availability of "free" gallium for uptake in bone. The administration of stable gallium has been shown to cause similar effects (6) while scandium, another competitor for serum binding sites, has also been reported to cause increased urinary excretion of gallium as well as decreased whole-body retention (7).

We conclude that the apparent cause of sexual differences in tissue uptake of gallium is the reduced numbers of serum binding sites for gallium in females. This results in a shift of gallium uptake primarily from blood to bone.

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FOOTNOTE

* Res-O-Mat Iron Kit, Mallinckrodt Nuclear.

REFERENCES

1. HAYES RL, BROWN DH: Biokinetics of radiogallium. In *Nuklearmedizin: Fortschritte der Nuklearmedizin in klinischer und technologischer Sicht.* Pabst HW, Hor G, Schmidt HAE, Eds. Stuttgart/New York, Schattauer Verlag, 1975, pp 837–848
2. LARSON SM, RASEY JS, ALLEN DR, et al: A transferrin-mediated uptake of gallium-67 by EMT-6 sarcoma. I. studies in tissue culture. *J Nucl Med* 20:837–842, 1979
3. LARSON SM, RASEY JS, ALLEN DR, et al: A transferrin-mediated uptake of gallium-67 by EMT-6 sarcoma. II. studies in vivo (BALB/c mice): concise communication. *J Nucl Med* 20:843–846, 1979
4. MUNRO HN, LINDER MC: Ferritin structure, biosynthesis, and role in iron metabolism. *Physiol Rev* 58:317–396, 1978
5. BRADLEY WP, ALDERSON PO, ECKELMAN WC, et al: Decreased tumor uptake of gallium-67 in animals after whole-body irradiation. *J Nucl Med* 19:204–209, 1978
6. HAYES RL: The medical use of gallium radionuclides: a brief history with some comments. *Semin Nucl Med* 8:183–191, 1978
7. HAYES RL, BYRD BL, CARLTON JE, et al: Effect of scandium on the distribution of ^{67}Ga in tumor-bearing animals. *J Nucl Med* 12:437–438, 1971 (abst)

Ga-67 Scanning during Peritoneal Dialysis

Radiogallium scanning (Ga-67 citrate) is a clinically useful procedure for identification of suspected occult inflammatory foci (1,2). Patients on long- or short-term peritoneal dialysis are more susceptible to infection, which is principally related to the dialysis procedure (3,4). Once generalized peritonitis or catheter infection is ruled out, identification of the suspected infection site could become a difficult task, and in such cases, radiogallium scanning may be considered beneficial (5).

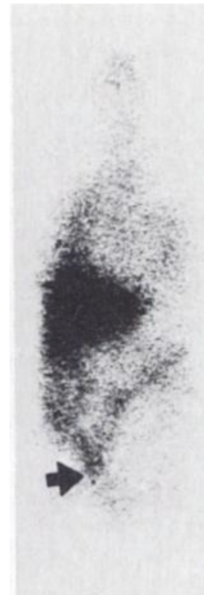

FIG. 1. Anterior view of head and torso at 72 hr after i.v. injection of 3 mCi of Ga-67 citrate, showing diffuse lung uptake, bowel activity, and uptake at dialysis catheter site (arrow).

Before we can use this technique to obtain clinically useful positive or negative information, two questions must be answered. How does peritoneal dialysis affect the tissue distribution of radiogallium? What percentage of the tracer will be dialyzed? We recently had a case that enabled us to provide answers, at least for this patient.

A 64-year-old white woman with otherwise unremarkable medical history was transferred to the University Health Center for the management of acute renal failure secondary to ethylene glycol intoxication. Peritoneal dialysis was started and continued. During the course of the dialysis she became febrile and initially did not respond to antibiotic therapy. A radiogallium scan was performed to rule out an occult infection site. After intravenous injection of 3 mCi of Ga-67 citrate, peritoneal dialysis was interrupted for 6 hr, and during the next 40 hr frequent samples of dialysate and two blood samples were obtained. Total-body scans obtained up to 144 hr after Ga-67 injection showed a good count

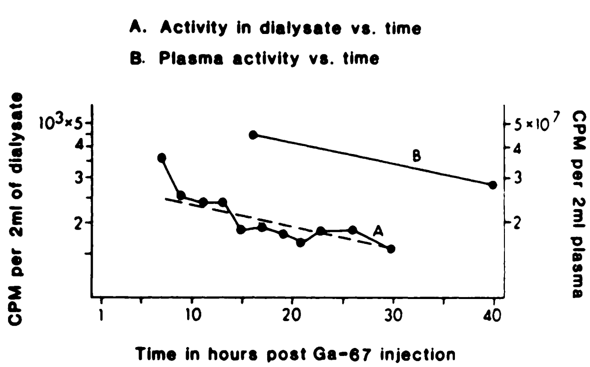

FIG. 2. Time course of Ga-67 activity in dialysate (curve A) and plasma (curve B).

rate, mild diffuse lung accumulation, and some uptake at the site of the dialysis catheter (Fig. 1). The peritoneal cavity showed no excess radiogallium uptake. Recovery of Ga-67 from the dialysate was 0.57% of the dose in the first 12 hr after administration and 0.66% during the second 12-hr period. Plasma activity was 1.4% of the dose per liter at 16 hr and 0.9% at 40 hr. Gallium-67 activity in the dialysate is plotted against time in Fig. 2. Plasma clearance of Ga-67 by peritoneal dialysis was 0.7 ml/min, so a negligible quantity of radiogallium is cleared by peritoneal dialysis. A likely explanation is that radiogallium is protein-bound; as shown by Marlette et al. (*6*) in a group of hemodialysis patients, only small quantities of radiogallium remain free to be dialyzed from the plasma. In their study, 0.5-8% of the injected dose of radiogallium was removed by hemodialysis. They emphasized, however, that the most reliable quantitation in their study was the one performed with ultrafiltration, in which 0.5% of the injected dose was dialyzed. This agrees with our results of 0.57 and 0.66% removal in two successive 12-hr periods of peritoneal dialysis.

These data demonstrate the feasibility of Ga-67 scanning in patients on peritoneal dialysis.

While this investigation was going on the patient became afebrile. No definite cause for her fever has been found.

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REFERENCES

1. SILVA J, JR, HARVEY WC: Detection of infections with gallium-67 and scintigraphic imaging. *J Infect Dis* 130:125-131, 1974

2. THADEPALLI H, RAMBHATLA K, MISHKIN F, et al: Correlation of microbiologic findings and ^{67}gallium scans in patients with pulmonary infections. *Chest* 72:442-448, 1977

3. ROXE DM, ARGY WP, FROST B, et al: Complications of peritoneal dialysis. *South Med J* 69:584-587, 1976

4. KOLMOS HJ, ANDERSEN KEH: Peritonitis with *Pseudomonas aeruginosa* in hospital patients treated with peritoneal dialysis. *Scan J Infect Dis* 11:207-210, 1979

5. KUMAR B, COLEMAN RE, ALDERSON PO: Gallium citrate (Ga-67) imaging in patients with suspected inflammatory processes. *Arch Surg* 110:1237-1242, 1975

6. MARLETTE JM, WAI MA K, SHAFER RB: Effect of hemodialysis on gallium-67 citrate scanning. *Clin Nucl Med* 5: 401-403, 1980

In-111 DTPA Detection of Cerebrospinal Fluid Leakage from the Thoracic Spine

Scinticisternography is of value for the location of a leak of cerebrospinal fluid in rhinorrhea or otorrhea (*1,2*). In addition, there are reports of contrast myelography demonstrating posttraumatic dural diverticula, cysts, and fistulae from the spinal canal (*3,4*). In our literature search we were unable to find a reported diagnosis of a cerebrospinal fluid leak involving the spinal canal by the intrathecal administration of a radiopharmaceutical.

Our case was a 24-year-old woman who was involved in an automobile accident a few weeks previously. At that time she presented with blunt injuries to the head and abdomen and a flail chest. She was referred for a cisternogram after a neurosurgical consultation for symptoms of orthostatic headaches, dizziness, and nausea, which were relieved by recumbency.

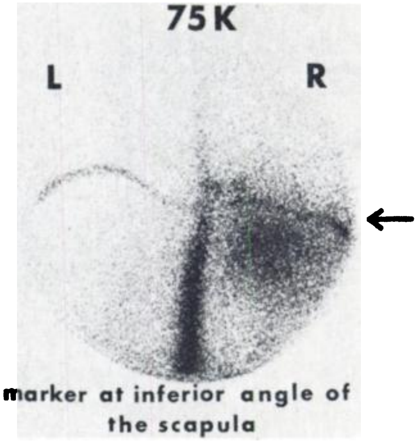

FIG. 1. Escape of radiopharmaceutical is noted from lower thoracic spine. No significant activity was seen in intracranial cisterns.

In the routine views the In-111 DTPA study showed no significant activity reaching the intracranial cisterns. A scan over the spinal canal demonstrated tracer loss from the lower thoracic spine (Fig. 1).

Following the cisternogram, tomograms of the thoracic spine were performed and revealed a previously unsuspected fracture involving the posterior elements, with subluxation ("chance fracture," Fig. 2).

A contrast myelogram also showed escape of the contrast material into the right posterior hemithorax (Fig. 3).

This case demonstrates the location of a transdural escape of radiopharmaceutical in a patient with a history compatible with a cerebrospinal fluid leak through tears in the arachnoid space and dura. It also shows that the use of scinticisternography need not be limited only to cases of cerebrospinal fluid rhinorrhea or otorrhea.

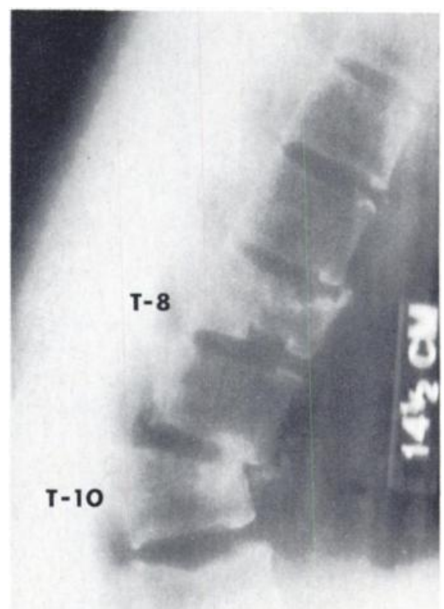

FIG. 2. There is compression of T-8, T-10, and T-11, and anterior subluxation of T-9 on T-10.