

Renal Flow Studies After Abdominal Aortic Aneurysmectomy and Axillo-Bifemoral Bypass Graft: Case Report

Margaret M. LaManna and Philip S. Yussen

The Medical College of Pennsylvania, Philadelphia, Pennsylvania

Vascular disorders affecting the kidneys are either acquired or congenital. Included in this category are common multiplicity of renal arteries, the rare arteriovenous malformation, stresses due to fibromuscular disease or atherosclerosis including abdominal aortic aneurysms, arterial thrombosis, venous thrombosis, and infarction (1). In contrast to the group of cystic and neoplastic kidneys where scintigraphic or pathologic anatomy are not diagnostic, scintigraphic or pathologic anatomy in vascular disease is often diagnostic by nuclear medicine techniques (2). The authors present an interesting case of evaluation of acute renal failure in a patient after abdominal aortic aneurysmectomy and axillo-bifemoral bypass graft.

CASE REPORTS

The patient is a 61-yr-old male admitted with fever, shortness of breath, and left lower quadrant abdominal pain. Blood cultures were positive for salmonella. The patient continued to spike temperatures, and the abdominal pain increased. A laparotomy was performed and a 13-cm abdominal aortic aneurysm was resected and a left axillo-bifemoral bypass graft performed. The patient received six units of packed red blood cells and eight units of fresh frozen plasma. Intra-operative hypotension was noted. Post-operatively, the patient's creatinine increased from 0.6 to 2.2mg/dl. The urine output had significantly diminished. A renal flow study (Fig. 1) was performed. Examination of the study demonstrated the site of aortic aneurysm resection (large arrow) and the left axillo-bifemoral bypass graft (small arrow). The kidneys were normal in size, position, and configuration. There are no areas of increased or decreased vascularity identified. Immediate and

five-minute posterior images were also then taken (Fig. 2). There was delayed transit of the radiopharmaceutical bilaterally (Fig. 3) and there was no evidence of hydronephrosis or obstruction. These findings were in keeping with ATN, and the patient's renal function improved over the course of the ensuing post-operative period.

DISCUSSION

In the case of an aortic aneurysm, the location of the aneurysm is critical in determining the degree of blood flow through the renal arteries. The aortic aneurysm may be proximal, mid or distal. In the case of a dissecting aortic aneurysm, acute renal failure may result from direct involvement of the renal arteries (vascular obstruction), from ATN caused by renal ischemia, or following the use of contrast agents. In such cases, substantial perfusion with either ^{99m}Tc -DTPA or hippuran coupled with prolonged transit time (cortical retention) is sufficiently diagnostic of ATN (3-4). The case presented illustrates the prolonged transit time attributed to ATN which occurred after intra operative hypotension following an abdominal aortic aneurysmectomy and axillo-bifemoral bypass graft. The nuclear study was vital and diagnostic in evaluating this patient.

REFERENCES

1. Tauxe WN, Dubovsky EB. *Nuclear medicine in clinical urology and nephrology*. Norwalk, CT: Appleton-Century-Crofts; 1985:113, 223-224.
2. Bell EG, McAfee JG, Makhuli ZN. Medical imaging of renal diseases—Suggested indications for different modalities. *Semin Nucl Med* 1981;11:105-127.
3. Freeman LM, Meng CH, Richter MW, et al. Patency of major renal vascular pathways demonstrated by rapid blood flow scintiphotography. *J Urol* 1971;105:473-481.
4. Hennessy WT, Pollack HM, Banner MP, et al. Radiologic evaluation of the anuric patient. *Urology* 1981;18:435-445.

For reprints contact: Margaret M. LaManna, M.D., Director, Nuclear Medicine, Deborah Heart and Lung Center, Trenton Road, Browns Mills, NJ 08015.

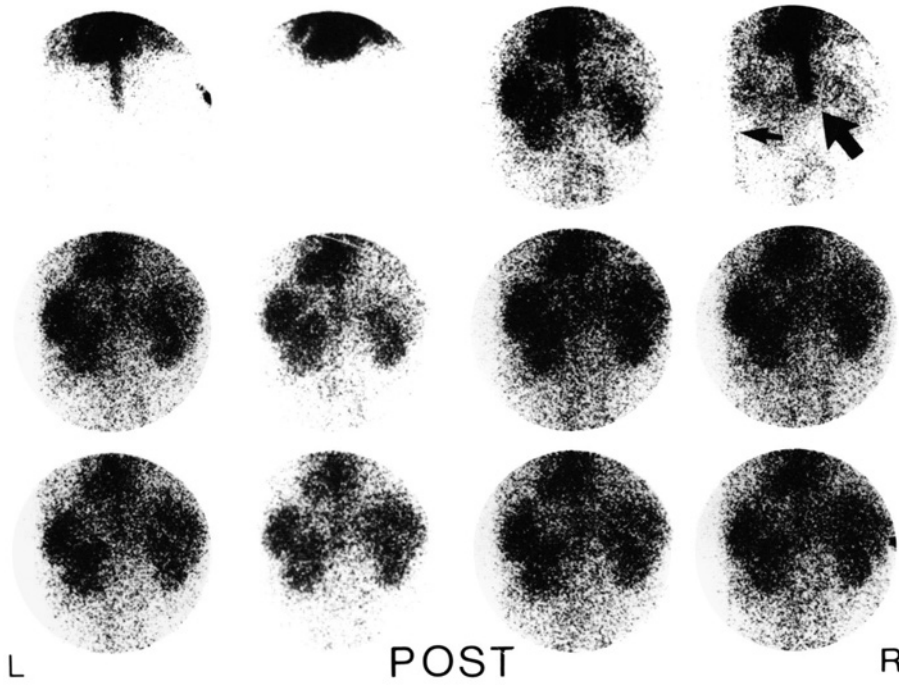


FIG. 1. Sequential scintiphotos of the abdomen were obtained in the posterior projection following the i.v. administration of 15 mCi of ^{99m}Tc -DTPA. Examination of the study demonstrated symmetric renal perfusion. The kidneys are normal in size, position, and configuration. There are no areas of increased or decreased vascularity identified. There is abrupt cutoff of the abdominal aorta (large arrow) at the site of aneurysmectomy. A faint linear streak of isotope is noted on the left (small arrow) indicating the site of axillofemoral bypass grafting.

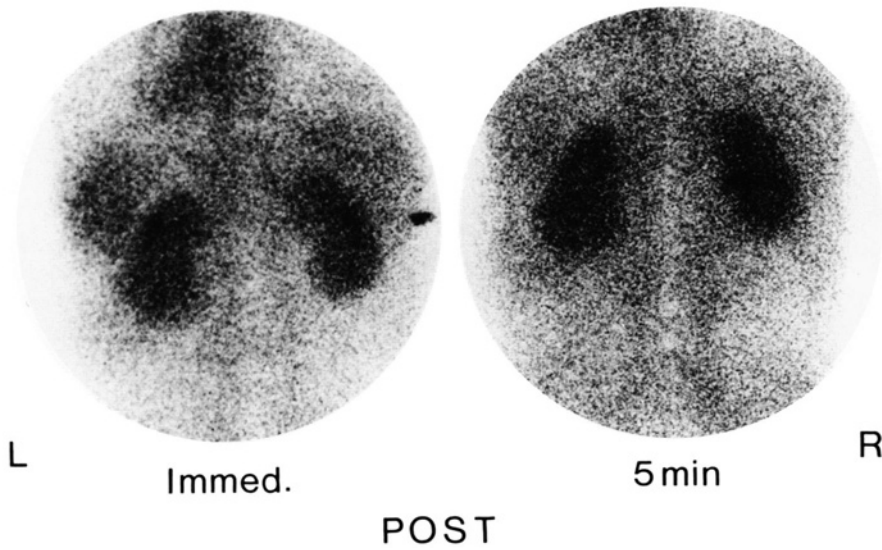


FIG. 2. Immediate and five-minute posterior images.

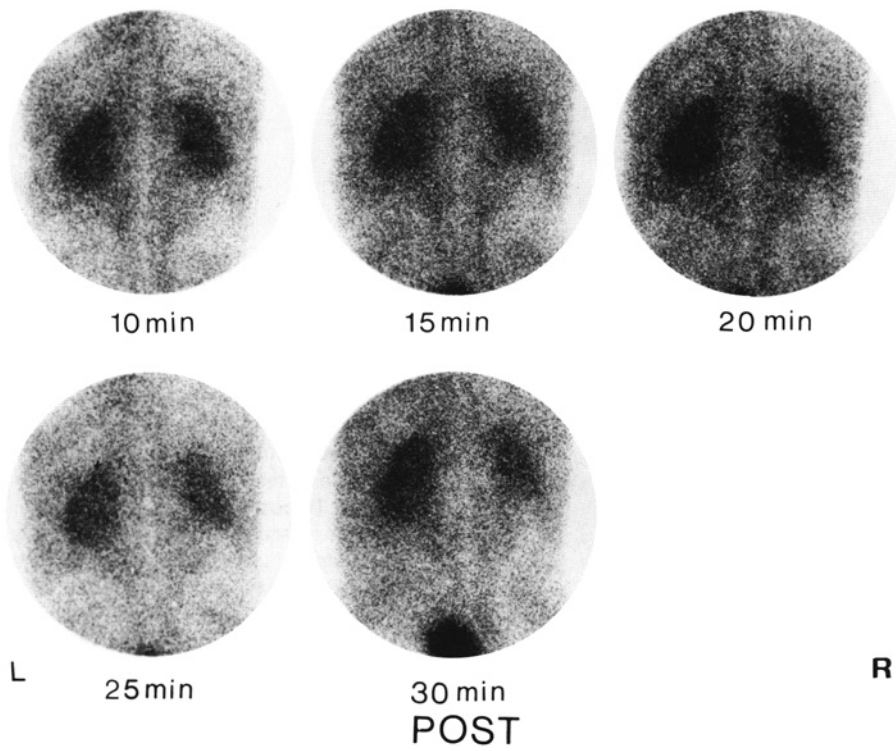


FIG. 3. Sequential static images. Examination of the study demonstrates delayed transit of the radiopharmaceutical into the pelvicaliceal collecting systems more marked on the right. There is no evidence of mechanical obstruction or hydronephrosis. The bladder is visualized.