

# Molecular imaging may be best for capturing renal transplant complications

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For more than 15,000 Americans each year, a kidney transplant can mean a new lease on life without dialysis, but complications following surgery are not uncommon. A recent study presented at SNM's 57th Annual Meeting suggests that the use of both physiological and structural images acquired from single photon emission computed tomography and X-ray computed tomography (SPECT/CT) hybrid imaging can help clinicians to better diagnose and treat patients suffering from a number of renal-transplant associated complications.

"SPECT and CT fused images provide both functional and anatomical information about the kidney, which provides better diagnostic capability and greater confidence to our physicians," said Shashi Khandekar, administrator of the nuclear medicine department, Cleveland Clinic, Cleveland, Ohio. "We are becoming more technologically savvy and we strongly feel that as more and more clinicians use hybrid SPECT/CT imaging, technologists also need to be prepared and acquire all of the necessary qualifications for this technology."

The study combined SPECT and CT imaging techniques to provide an in-depth portrait of the biological processes of renal function. Traditionally, physicians have used two-dimensional planar imaging to evaluate post-renal transplant complications, which include urinary leak, infection and transplant non-viability or kidney failure. However, a recent retrospective study conducted by the Cleveland Clinic showed that three-dimensional SPECT/CT hybrid imaging is ideal for imaging these and

other disease states. Employing SPECT/CT imaging may even answer clinical questions that could otherwise have led to further imaging studies, invasive biopsies and delayed treatment for the patient.

The retrospective study involved 12 renal transplant cases, in which 10 patients were suspected of having a urinary leak, one patient showed evidence of kidney failure and one patient was thought to have a transplant-associated infection. After traditional planar imaging, all patients were scanned using non-circular SPECT imaging and low dose non-contrast [CT imaging](#) using a hybrid SPECT/CT system. The use of SPECT/CT with Tc99m-MAG3, an imaging agent taken up by the kidneys and used to evaluate [renal function](#), helped clinicians positively identify urinary leaks for 7 of the 10 patients when fused imaging revealed fluid outside the anatomical confines of the patients' urinary system. The molecular imaging technique was also able to successfully identify [kidney failure](#) using the same agent, and infection was detected in one patient injected with In-111 labeled WBC, an agent that helps image leukocyte activity associated with the body's immune response.

Provided by Society of Nuclear Medicine

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