Research published in the June issue of the *Journal of Nuclear Medicine* suggests that radiolabeled recombinant tissue plasminogen activator can perform double duty for evaluations of deep vein thrombosis: It can diagnose the presence of DVT and distinguish between new and old thrombi. Peer-reviewed reports in the May medical literature reflect the growing value of medical imaging for diagnosing, assessing, and guiding the treatment of cardiovascular disease.

Deep vein thrombosis

**Aging of acute deep vein thrombosis measured by radiolabeled Tc-99m-rt-PA**
*JNM 2007;48(6):873-878*

Previous studies have determined that recombinant tissue plasminogen activator (rtPA) labeled with technetium-99m is a good choice for identifying deep vein thrombosis. The diagnostic power of rtPA for this role stems from its proclivity to bind to the C-terminal lysine residue on fibrin. The number of fibrin sites is thought to decline as the thrombus ages, suggesting that Tc-99m-rtPA can calculate thrombus age as well. Hematologists Dr. Timothy Brighton and Julia Janssen and nuclear physician Dr. S. Patrick Butler, all associated with St. George Hospital in Sydney, Australia, put the theory to the test using 64 patients with acute symptomatic DVT. Ultrasound and rtPA SPECT were used to diagnose DVT. The examinations were repeated on days 7 and 30 to monitor changes. Ultrasound identified residual thrombus in 46 of 55 patients with known thrombus after seven days and 29 of 44 patients on day 30. From the Tc-99m-labeled rtPA studies, enhancement was apparent in 33 patients after seven days and none of the 44 after 30 days. The findings suggest the technique can distinguish fresh thrombi from old, an important consideration for DVT treatment.

**Pulmonary vein ablation**

**Detection of pulmonary vein and left atrial scar after catheter ablation with three-dimensional navigator-gated delayed enhancement MR imaging: initial experience**
*Radiology 2007;243:690-695*

Researchers at Beth Israel Deaconess Medical Center undertook a preliminary prospective trial to determine whether delayed-enhancement MRI can depict scar caused by radiofrequency ablation of the left atrium in patients with atrial fibrillation. Based on experience with 23 patients, Dr. Dana Peters and colleagues found that delayed enhancement is well-suited for the role. No enhancement delay was evident in the atrial or pulmonary vessel wall preablation. But after ablation, investigators observed a delayed enhancement pattern in the left inferior pulmonary vein in all patients. Average involvement was 88% of the circumference. A relationship between delayed-enhancement wall thickness and the inverse of the time interval from ablation was identified.

**In-stent restenosis**

**Usefulness of 64-slice multislice computed tomography coronary angiography to assess in-stent restenosis**
*J Am Coll Cardiol 2007;49:2204-2210*

In a multicenter prospective study of 182 patients with previous coronary artery stent placement, European investigators found that 64-slice MSCT accurately diagnoses in-stent restenosis. Because of its 99% negative predictive value, 64-slice CT can be relied on for excluding in-stent restenosis. Quantitative coronary angiography was used as a standard of reference for the presence of 50% or more in-stent restenosis. Fourteen (7.3%) stented segments were excluded because of poor image quality. The modality correctly identified 19 of the 20 significantly restenosed stents. Dr. Jeroen J.
Adenosine stress

**Adenosine stress protocols for myocardial perfusion imaging**
*J Nucl Cardiol 2007;14:415-416*

The American Society of Nuclear Cardiology affirmed its longstanding recommendation favoring the six-minute infusion protocol for adenosine stress myocardial perfusion imaging. The ASNC's Quality Assurance Subcommittee for Laboratory Quality, chaired by Dr. Benjamin D. McCallister, recognized the four-minute adenosine protocol as a reasonable alternative to the six-minute approach, however. The subcommittee recommended tracer be injected two minutes after adenosine injection begins and allowing two minutes for circulation time. The report noted that variations of this protocol extending beyond four minutes are acceptable, provided that adenosine infusion is continued for at least two minutes after tracer injection. About one million patients undergo adenosine stress myocardial perfusion imaging annually. The subcommittee's paper is a response to the growing popularity of abbreviated adenosine protocols.

Renal artery stenosis

**MDCT angiography of the renal arteries in patients with atherosclerotic renal artery stenosis: implications for renal artery stenting with distal protection**
*AJR 2007;188:1652-1658*

Percutaneous transluminal renal angioplasty is becoming first-line therapy for ostial atherosclerotic renal arterial stenosis. Clinical outcomes have been inconsistent, possibly because of distal embolization from plaque material displaced during stent deployment. Distal protection offers a possible solution, though no approved device exists. Off-label use of devices designed for coronary and carotid use has been frustrated by anatomical differences between renal, coronary, and carotid arteries. In this study of 108 patients, Dr. Adam D. Talenfeld and colleagues in the interventional radiology division of Mount Sinai Medical Center in New York identified substantial patient-to-patient variation in the lengths and diameters of renal arteries themselves. The findings suggest that most commercially available distal protection devices do not accommodate renal artery anatomy for renal angioplasty.

Dilated cardiomyopathy

**Diagnostic accuracy of multidetector computed tomography coronary angiography in patients with dilated cardiomyopathy**
*J Am Coll Cardiol 2007;49:2044-2050*

Using 16-slice CT, cardiology researchers at the University of Milan in Italy determined that MSCT is a safe and accurate alternative to coronary angiography for differentiating idiopathic and ischemic dilated cardiomyopathy. Dr. Daniele Andreini and colleagues compared coronary artery MSCT and x-ray angiography for two patient groups. One involved 61 patients with DCM of unknown origin; the control group involved 139 patients with normal cardiac function but indications for coronary angiography. Ten complications arose during conventional angiography for patients in the first group. Feasibility of coronary artery visualization with MSCT was 97.2% with diagnostic assessment possible for 863 of 888 segments. MSCT also identified the 44 normal and 17 pathological cases diagnosed with conventional angiography. The sensitivity and specificity rates were 99% and 96.2% respectively. Sensitivity and specificity rates in the control group were 86.1% and 96.4% respectively.

Coronary artery calcification

**Risk factors for the progression of coronary artery calcification in asymptomatic subjects: Results from the multi-ethnic study of atherosclerosis (MESA)**
*Circulation 2007;115:2722-2730*

Based on serial coronary artery calcium measurements from 5756 program participants, the first large multiethnic study on CAC found that Caucasians have a higher incidence of and progression rates for CAC than healthy African American, Hispanic, or Chinese volunteers. The incidence of newly detected coronary artery calcium averaged 6.6% per year across the whole cohort. The median
annual change in CAC for those with existing calcifications at baseline was 14 Agatston units for women and 21 Agatston units for men. Most traditional cardiovascular risk factors were associated with both the risk of developing new coronary calcium and increases in existing calcification. These risk factors included, age, male gender, white race/ethnicity, hypertension, body mass index, diabetes mellitus, glucose, and family history of heart attack.

Disclosures:

Source URL: http://www.diagnosticimaging.com/articles/tc-99m-rtpa-spect-determines-age-deep-vein-thrombosis

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