



NEWS from SOUTHTOWNS RADIOLOGY

SPRING 2010

Welcome to *The Inside View*, brought to you by Southtowns Radiology. Each quarterly issue will offer updates on the latest trends and practices in medical imaging. In this issue, our physicians will share expert observations on the ABC's of patient-friendly abdominal MRI, the basics of Peripheral Arterial Disease, advantages of Cardiac Computed Tomographic Angiography, and a discussion about the recent mammogram controversy. If you prefer to receive our newsletter electronically, please e-mail Cathy Fitzgerald at [cfitz@southtownsradiology.com](mailto:cfitz@southtownsradiology.com).



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**MRI TECHNOLOGY**

**The ABCs of Patient-friendly MRI of the Abdomen**

**Dr. James Fitzgerald**

MRI has become an increasingly utilized means of evaluating disease processes in the abdomen. Early difficulties with motion artifact and low resolution have been largely overcome with improvements in imaging techniques and better coil designs. Numerous studies have demonstrated MRI of the abdomen to be both specific and sensitive in diagnosing and characterizing pathology in this area.

MRI has many advantages when compared to CT scan. First, no ionizing radiation is used. This is particularly important in younger patients and those that are pregnant. For lesions which require follow-up, the cumulative radiation dose of serial CT scans can be avoided. Because no ionizing radiation is used, IV contrast-enhanced images can be obtained in multiple phases (arterial, portal venous and delayed) in all patients. With CT radiation, dose is multiplied by the number of phases and can be quite high.



Further, tissue contrast is better. MRI is better than CT in its ability to demonstrate lesions which are similar in density. Fat or water suppression and relative signal weightings can be used to further increase conspicuity of lesions and improve characterization.

The IV contrast agent (gadolinium) can often be used in patients allergic to CT scan dye. The incidence of allergy and nephrotoxicity is much lower than that of CT scan dye.

MRI of the abdomen has many currently accepted uses. These include but are not limited to:

- Clarify indeterminate masses identified on CT or Ultrasound.
- Evaluate indeterminate cystic lesions in the kidneys and pancreas.
- Differentiate adrenal metastasis from adenoma.
- Stage certain malignancies.
- Evaluate diffuse liver disease (fatty infiltration, hemochromatosis, etc.).
- Surveillance for hepatoma in patients with cirrhosis/hepatitis C.
- MRA/MRV to evaluate the arterial and venous structures (including portal vein).
- MRCP to evaluate the biliary ducts and gallbladder.
- Diagnosis of appendicitis in pregnant patients with indeterminate ultrasound.

The standard MRI abdomen protocol can be performed in 25–30 minutes and evaluates all of the previously mentioned indications. For most patients, an MRI scan is safe and well tolerated. A small number of patients are claustrophobic but sedation is available. Certain patients cannot be scanned, particularly those with internal pacer/defibrillators, cochlear implants, certain aneurysm clips and breast tissue expanders. Other implants may be relatively contraindicated and will be reviewed by the technologist. These include middle ear prosthesis, surgical clips, neurostimulators and orthopedic implants.

In summary, MRI of the abdomen has become an acceptable adjunct and occasional alternative to CT without ionizing radiation. I predict its use will grow exponentially over the next decade.

## VASCULAR &amp; INTERVENTIONAL RADIOLOGY

## Peripheral Arterial Disease: What It is and How to Treat It

## Dr. Al Benedicto

Peripheral arterial disease (also known as PAD) is a common malady that affects the arteries to the limbs. Atherosclerosis is the most common disease affecting the lower extremity arteries. The process starts at the endothelial level resulting in vascular injury. The injury results in an inflammatory response and fatty deposition. Repeated insults to the vessel results in scar and plaque deposition that eventually leads to scarring and narrowing of the vessel. Narrowing in the blood vessels compromises blood flow in the circulation bed it delivers, whether it is in the heart or the legs.

PAD is very prevalent even in those people who do not have symptoms. Risk factors that increase your chances of having PAD include: Age | Smoking | Obesity | Being male | Hyperlipidemia | Diabetes | Hypertension | Family history

Most patients with PAD have multiple risk factors. The typical patient also presents with diffuse disease in a bilateral distribution. There is a predilection for significant disease processes to affect the vessels at branch point, in particular the distal aorta, common iliac, external iliac, distal superficial femoral, and tibial arteries.

Many of our patients present a variety of symptoms. We classify patients based on the following five categories:

- Asymptomatic – Patients without symptoms
- Classic claudication – Extremity pain confined to the lower leg muscle reproducible with exercise to a determined distance and relief with rest.



- Atypical leg pain – Extremity pain in the lower legs that is exercise-induced but is not reproducible at a determined distance, alleviated with rest, or by limiting daily activity.
- Critical Limb Ischemia – Resting leg pain, nonhealing ulcer or gangrenous tissue.

- Acute Limb Ischemia – The five P's which threaten the viability of the limb are: Pain | Pulselessness | Paralysis | Paresthesia | Pallor

The diagnosis of PAD can be determined with a patient's medical history and physical examination as the initial steps. Based on those two factors, the diagnosis can be confirmed with ankle/toe brachial index, pulse volume recording, ultrasonography, computed tomography/magnetic resonance angiography, and contrast angiography.

The scope of treatment is composed of lifestyle modification (weight loss, exercise and smoking cessation), blood and lipid control, and surgical or endovascular revascularization.

Southtowns Radiology is proficient in all of the previously-mentioned imaging modalities. We can provide a timely diagnosis and devise a treatment plan to address the patient's symptoms. In addition, our vascular and interventional radiologists are experts in diagnosing and treating PAD. We have more than 50 years of combined experience in our vascular section. Our interventional radiologists have undergone an intense training process lasting over 13 years to achieve expertise in the field.

## BREAST CANCER SCREENING

## Despite the news, Screening Makes Sense for Patients 40 Years and Older

## Claudia Fosket MD

Breast cancer is the second-leading cause of death among women but its rate has decreased by almost 30% since 1990. Regarding the recent controversy involving screening mammography, the facts are irrefutable. At least seven controlled studies have shown that screening mammography has resulted in a statistically significant decrease in breast cancer mortality for women aged 40 years and older. Therefore, there is no question that we need to continue with our screening of women age 40 and older. It is important to note that 70-80% of women who develop breast cancer have no family history. Clearly, screening only women with increased risk would result in many undiagnosed cases of breast cancer.

Digital mammography is one of the most recent advances in breast imaging. Although it uses conventional X-rays, the images are captured on a special electronic detector (similar to those used in digital cameras) which is then converted to a digital image to be viewed on a computer monitor. This allows manipulation of the image with contrast, brightness and magnification not available with film screen mammography. It also gives the radiologist more tools to detect early cancers. In many cases, this also makes the need for repeat images unnecessary. Studies have shown that digital mammography was superior to film screen mammography in detecting early cancers in women with dense breasts (those under the age of 50). It is also easy to incorporate the CAD (a computerized second look) into the system seamlessly.

Computerized storage of these images gives us the ability to view them from multiple sites within the system, thus allowing our colleagues to render second opinions quickly. Studies are not lost and the comparison of several old studies is no longer cumbersome.

## CARDIOLOGY

## The Advantages of Cardiac Computed Tomographic Angiography

## Dr. Gerald Joyce

Cardiac Computed Tomographic Angiography (CCTA) has evolved rapidly over the last several years. With the advancement of equipment and techniques, the peer-reviewed literature has filled with articles documenting its diagnostic accuracy and its cost-effectiveness. CCTA is no longer an "investigative technique." CCTA has arrived, and is a well understood and accepted weapon in the fight against cardiac disease.

Which patients are candidates for CCTA? A paper published by a group consisting of members from eight separate medicinal societies, including the American Colleges of Cardiology and Radiology, defined the current accepted Appropriateness Criteria for CCTA. The majority of patients who are candidates for CCTA fall into one of the following categories:

- Acute chest pain syndrome, with intermediate Framingham risk criteria
- Patients with equivocal stress tests
- Suspected coronary artery anomaly
- Possible cardiac mass

Which patients are not candidates for CCTA?

- Asymptomatic patients
- Patients with acute chest pain and low or high Framingham risk criteria
- Patients with atrial fibrillation, contrast allergy, or renal insufficiency

CCTA is the only technique outside of conventional angiography that allows direct visualization of the coronary arteries. Studies confirm that CCTA is as accurate at excluding coronary artery disease (98-99%) as catheter angiography. This is done at lower risk to the patient, at a substantially lower cost, and potentially the same or lower radiation dose as conventional angiography.

CCTA is not a test that can be performed at any CT scan facility. It is a technically demanding study to perform and interpret properly. It should be performed on a CT of 64 slice capacity or greater, and by an experienced and accredited team of technologists and physicians. All of this is available to you and your patients here at Southtowns Radiology.

Patient preparation instructions for CCTA:

- Please do not eat four hours prior to appointment.
- Please do not drink any caffeine for 24 hours prior to your appointment.
- You may drink a minimal amount of water and take prescribed medications.
- Please do not take Viagra, Cialis, or Levitra for 48 hours prior to your appointment.
- Please do not smoke the day of your appointment.
- Please do not participate in any heavy exercise before your appointment.
- Arrive 30 minutes prior to your scheduled appointment time.
- Please bring your script, insurance card, and any previous cardiac testing such as stress test, or angiogram.
- Please make sure your doctor has blood work within last six months which must include a BUN Creatinine blood test.

What Patients Can Expect the Day of the Test:

Patients will be asked to change into a gown taking off everything from the waist up. Please, no earrings or necklaces. They will then be taken into a resting room where a nurse will insert an IV and take vital signs.

Optimal result of a CCTA exam requires that a patient's heart rate be 50-60 beats per minute. In order to achieve this, the patient may be given a beta blocker to reduce heart rate. After they are given the medication they will rest for 30-60 minutes to allow the beta blocker to take effect. Heart rate and blood pressure will be monitored again by the nurse. If the heart rate is at the optimal rate, we will begin the test.

The technologist will take the patient into the CT room.

The patient will lie on a table on their back and electrodes will be applied. Before the scan, a nitroglycerine tablet will be given. Next, contrast dye will be injected via IV. During the injection the patient may feel a warm sensation or an urge to urinate. The dye highlights blood vessels for the CCTA pictures. During the scan the patient will be asked to stop breathing (for about eight seconds) while the pictures are taken. The actual CCTA scan usually takes about 15 minutes to complete.

What to Expect After the Test:

Patients will be able to resume normal activity. They are encouraged to drink plenty of fluids throughout the day. Patient results will be forwarded to your office. Patients will then receive their results from the ordering physician.

## Our Wealth of Services

High Field & Open MRI | Multi-Slice & 64-Slice CT Scanning | Digital Mammography | 3D & 4D Ultrasound | Bone Densitometry | Breast Biopsy Minimally Invasive Special Procedures | PET/CT Scanning | Routine X-Ray & Fluoroscopy | Treatment of Varicose Veins | Uterine Fibroid Ablation Canadian Patients | Women's Services