MRI Spectroscopy Enhances Diagnoses of Brain Disorders

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Although MRI has greatly increased the neuroradiologist's ability to differentiate benign from neoplastic processes, there are still lesions which cannot be diagnosed using anatomic imaging (see Figures 1 and 2). These indeterminate abnormalities must be followed, and are a source of patient anxiety. Occasionally, the inability to differentiate tumor from other benign processes can even result in incorrect treatment or unnecessary brain biopsy.

MRI spectroscopy is an in vivo assay of important biochemicals within a tissue. Spectroscopy analyzes the relative concentrations of different chemicals within a brain sample. The results are recorded as a spectra. Unlike the anatomic images we are accustomed to seeing, the spectrum is a series of peaks: each peak is the unique signature of an important brain constituent. Not unexpectedly, brain neoplasms typically have very different chemical constituents than normal brain and inflammatory diseases. Recent literature also suggests that spectroscopy can differentiate neurodegenerative processes such as Alzheimer’s disease and mesial temporal sclerosis from normal brain.

Currently, well established indications for MR spectroscopy of the brain include brain tumor diagnosis, monitoring glioma response to therapy (especially radiation), ischemic encephalopathy and brain abscess. Future indications for spectroscopy may include dementia evaluation and epilepsy.

MRI spectroscopy is currently offered at the Raleigh MRI Center and West Raleigh MRI facilities of Wake Radiology.

Figure 1. The T2 weighted image demonstrates a right brainstem lesion in a young woman with new left sided weakness and numbness. Initial diagnostic considerations included glioma or demyelinating disease.

Figure 2. Single voxel spectrum obtained from the right pontine lesion. The spectroscopic findings are more suggestive of active inflammation rather than tumor. Symptoms improved without therapy and a follow up MRI six months later demonstrated new periventricular lesions confirming the diagnosis of multiple sclerosis.
Musculoskeletal imaging encompasses a broad spectrum from conventional radiographs for the injured or painful extremity to advanced resonance imaging requiring intra-articular fluoroscopic-guided injections of contrast, in order to outline cartilaginous structures prior to the scan.

Plain films require little explanation and have been available for over 100 years since the initial discovery of the “x” ray by Wilhelm Roentgen in Germany. Fluoroscopy involves evaluating bony structures while observing the patient actually moving the structure. We use fluoroscopy guided injections to help orthopedists localize the cause of pain and to help predict the success of certain operative procedures such as joint fusions. We also use fluoroscopy to guide joint injections to relieve pain in known arthritic or otherwise painful areas.

CAT (computed axial tomography) allows more extensive evaluations of injuries in order for an orthopedic surgeon to make the appropriate decision of whether surgery will be beneficial and to help plan preoperatively. It is also useful in complex bones (pelvis, shoulder, facial bones, etc.) to demonstrate injuries not visible with conventional radiographs. Advances in computers now allow for 3-D reconstructions providing even more insight for treatment. CAT scans are also used to guide injections for therapy in unusually difficult to localize joints such as the sacro-iliac joint or the facet joints (small joints in the posterior aspect of the spine).

MRI (magnetic resonance imaging) has been the biggest breakthrough in musculoskeletal imaging due to its ability to not only image the bone and marrow more sensitively but in its ability to demonstrate soft tissue structures such as the cartilage within the knee and muscles. Shoulder, knee and spine MRIs are now common diagnostic procedures utilized to delineate abnormalities which may require surgical intervention. Injection of MRI contrast agents directly into the joint such as the shoulder or hip can depict injuries previously only seen by arthroscopic surgery. Myelograms, which were once used to evaluate disc herniations and required injections of x-ray dye around nerve roots, have also been virtually replaced by lumbar spine MRI examinations.

Thus, musculoskeletal imaging covers the gamut of simple radiographs to advanced CAT with 3-D reconstructions to magnetic resonance imaging. The most important feature of all musculoskeletal examinations is coordination between the referring doctor and the radiologist, as well as the availability of state-of-the-art equipment operated by highly trained technologists in order to appropriately tailor the examination for the patient.

Wake Radiology Introduces New Breast Cancer Detection Tool

Wake Radiology will significantly enhance its mammography capability with the R2 ImageChecker Computer Aided Detection (CAD) system. The R2 assists radiologists in analyzing mammographic images for suspicious regions that may be indicative of cancer.

The ImageChecker CAD system’s specialized processing software allows a more comprehensive analysis of images that may suggest a cancer. The R2 CAD system will be installed in Wake Radiology’s outpatient imaging centers in North Hills, West Raleigh, Cary and Village Radiology in Chapel Hill by the end of this year, said managing partner Dr. Robert E. Schaaf.

During 2001, 192,000 new cases of breast cancer were estimated to occur among women in the United States. “We look to the addition of the R2 system to help us provide better and more comprehensive service to our mammography patients,” said Dr. Schaaf.
Public Learns CPR Techniques from Wake Radiology

Wake Radiology was a primary sponsor and hosted an informational booth at the first annual CPR for Family and Friends, held at the Raleigh Entertainment and Sports Arena on August 3rd. The event attracted several hundred members of the public.

The event was organized by The American Heart Association (AHA) with a campaign theme, “Strengthening the Chain of Survival,” which focused on the important role the general public can play in saving the lives of heart attack victims by quickly calling 911 and administering CPR.

Wake Radiology provided information on cardiac calcium scoring, which is a new, painless, non-invasive test that can determine if one is at risk of developing coronary artery disease, a leading cause of heart attacks. In addition, the public was educated about the risk factors for stroke. Wake Radiology volunteers provided brochures on Carotid Doppler Ultrasound, which is used to determine the amount of blood flow to the brain.

Wake Radiology Diagnostic Imaging, Village Radiology Consultants, Raleigh MRI and Wake Radiology Oncology Services participate with the following plans:

- Aetna US Healthcare
- AHA (American Healthcare Alliance – they use MedCost’s network)
- Alliance PPO (a MAMSI product)
- Blue Cross and Blue Shield – all plans
- CCN
- CIGNA HealthCare – all plans
- Doctors Health Plan
- Duke Health Direct
- Health Care Savings
- MAMSI Life & Health PPO
- MedCost – all plans
- Medicaid
- Medicare
- Optimum Choice of the Carolinas Inc.
- OCCI – a MAMSI product
- PARTNERS National Health Plans of North Carolina, Inc.
- TRICARE
- UnitedHealthCare of North Carolina, Inc.
- UnitedHealthCare Insurance Company
- United Medicare+Choice
- Wellpath/Coventry (**Wake Radiology Oncology Services only)

Note: Patients who are in a plan that we do not participate with can be seen on an out-of-network basis. A patient can choose this option with a higher deductible and/or higher co-insurance. We will be glad to contact the insurer to get eligibility and benefit coverage if requested.

Wake Radiology continues to align its managed care contracts with those of its referring physicians. If there are additional plans that we should consider, please call Michele Jackson at (919) 788-7904 or fax to (919) 789-4461, or email mjackson@wakeradiology.com.

Andrew Kennedy, MD, is New Director of Wake Radiology Oncology Services

Wake Radiology welcomes Dr. Andrew Kennedy as director at Wake Radiology Oncology Services PLLC, located at 300 Ashville Avenue in Cary. The Oncology Services center was the first freestanding cancer treatment center in the Triangle, and offers cutting-edge technology and state-of-the-art diagnostic and radiation treatment services.

Dr. Kennedy joins the practice from the Department of Radiation Oncology at the University of Maryland School of Medicine where he served as associate professor and residency program director.

“The recruitment of Dr. Kennedy enhances the capability of Wake Radiology Radiation Oncology Services and underscores our dedication to the highest quality cancer treatment,” said Dr. Robert Schaaf, Wake Radiology’s managing partner.

Prior to his work at the University of Maryland, Dr. Kennedy served as assistant professor and clinical director in the Department of Radiation Oncology at East Carolina University. He is board certified by the American Board of Radiology.

Dr. Kennedy attended and interned at Loma Linda University School of Medicine in Loma Linda, CA. He was chief resident in Radiation Oncology at the University of North Carolina at Chapel Hill School of Medicine.
The “Triangle We Care” program is an exclusive program designed to benefit both Triangle residents as well as a select group of outstanding business professionals. Exclusive member professional businesses are background approved, guarantee your satisfaction, adhere to a code of ethics and care about you and your community. Wake Radiology is the only radiology provider included on the preferred list. To find out more, visit www.wral.com and click on “Triangle We Care.”

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