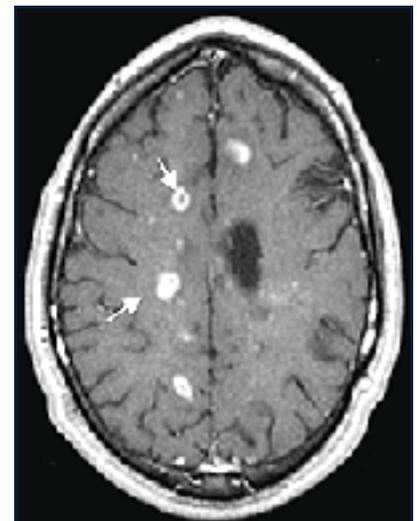


MRI
MULTIPLE
SCLEROSIS

Contrast-Enhanced MRI Shows Efficacy of MS Treatment

In a new study published in the *New England Journal of Medicine*, 104 patients with relapsing-remitting multiple sclerosis were randomly assigned to receive two doses of either a placebo or intravenous rituximab. Their responses to treatment were monitored at 12, 16, 20, and 24 weeks after treatment using contrast-enhanced MRI, with the number of gadolinium-enhancing lesions as a marker of treatment response. The authors found that patients who received rituximab had both a decrease in the number of lesions and reduced numbers of new lesions as compared to the placebo group. The results were sustained up to 48 weeks. The group who received rituximab also has had fewer clinical relapses. **Conclusion: Contrast-enhanced MRI showed that administration of rituximab in MS patients decreases the number of lesions. These patients also had fewer clinical relapses.**¹



MRI of the brain following gadolinium, demonstrating enhancement of MS lesions.

MRI
CONTRAST

Contrast-Enhanced MRI: What You Need To Know

- **What is contrast?***
 - o A contrast agent is a substance that, when inside the patient's body, highlights certain organs or structures and makes them easier to see
- **Types of contrast**
 - o Intravenous (injected into a patient's vein)
 - o Enteric
 - Administered orally or rectally to see the gastrointestinal tract
 - o Intra-articular
 - Contrast may be injected into a joint cavity to outline the structures
- **Intravenous (IV) contrast**
 - o The term "contrast-enhanced" MRI or CT refers to intravenous contrast
 - o After being injected into a vein, it localizes to blood vessels and all areas of the body that receive a blood supply
 - o Allows a radiologist to assess for abnormalities in blood vessels, structural abnormalities of organs, and abnormal tissues (like tumors) that either receive too much or too little blood supply

- **MRI intravenous contrast: gadolinium**

- o The IV contrast agent most widely used for MRI is gadolinium, a rare earth element
- o A relatively small amount of gadolinium is administered because it is a powerful contrast agent (about 5 to 20cc)
- o Safety issues
 - Allergic reactions
 - The incidence of allergic reactions to gadolinium is very low (less than 0.1%)
 - The incidence of serious allergic reactions to gadolinium is extremely rare (about 0.005%)²
 - Nephrogenic systemic fibrosis (NSF)*
 - NSF, also known as nephrogenic fibrosing dermopathy, is a rare disease first recognized in 1997 and first characterized in 2000
 - Until May 2007, only about 215 cases had been reported
 - Recently, a strong link has been found between administration of gadolinium-based contrast and development of NSF
 - NSF is only seen in patients with renal insufficiency who receive gadolinium
 - It causes severe skin fibrosis, and may lead to fibrosis of other organs and death

- **MRI intravenous contrast: uses**

- o Detection of tumors and tumor response to therapy
- o Detection of areas of inflammation
- o Evaluation of blood vessels
- o Evaluation of blood flow to a bone, for avascular necrosis

*Also see Volume 1, Number 9



New MRI Technique Can Non-Invasively Detect Early Osteoarthritis

Glycosaminoglycans (GAG) are molecules that serve vital functions in cartilage and intervertebral discs. Basing their approach on the fact that the proton groups in GAG molecules are not tightly bound, researchers from New York and Tel Aviv Universities found that GAG can demonstrate an MRI signal that is different from surrounding tissue. Thus, a chemical exchange saturation MRI (gagCEST) can non-invasively and directly measure the concentrations of GAG in an area. This could allow detection of osteoarthritis at an early stage that may not otherwise be detectable, and could also “help to indicate early interventions for degenerative disc disease.”³

Conclusion: A new MRI technique can non-invasively detect very early osteoarthritis or vertebral disc degeneration.⁴

SOURCES

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