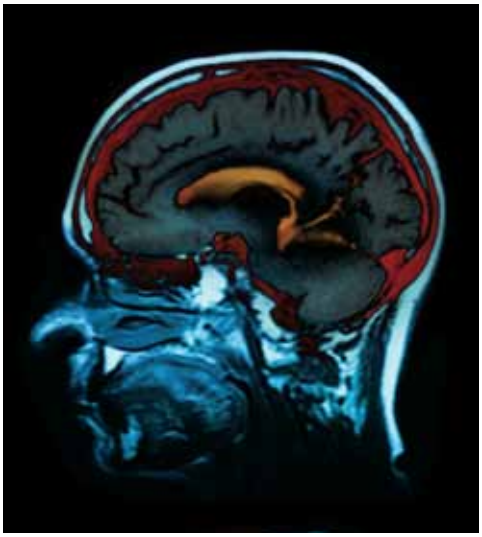
Susceptibility Weighted Imaging



What is SWI?

Susceptibility Weighted Imaging (SWI) is a cutting-edge technology that uses extremely high-resolution imaging to detect damage to the brain caused by microhemorrhages, shearing and diffuse axonal injuries. The technology was originally developed to map the brain's venous architecture.

This high-resolution imaging allows medical professionals to see even the smallest lesions in the brain. By exploiting the susceptibility differences between tissues, SWI's high-resolution enhanced-contrast imaging maps areas of the brain that exhibit venous blood, hemorrhage and iron storage.

Why is it useful?

This technology has the potential to help medical professionals provide more precise diagnoses for a wide range of neurological disorders and injuries. It also paves the way for better long-term studies with patients.

What does it do?

SWI is effective in detecting brain abnormalities due to head trauma, stroke, tumors, hemorrhages, multiple sclerosis and Alzheimer's disease.

For example, SWI can display images of hemorrhages in the brain for those suffering from stroke. It may also be able to pinpoint the origin of the stroke itself and identify the exact location of the at-risk tissue. Although the specific reason SWI is able to capture these images is still being explored, it may be due to increased venous blood volume or reduced oxygen-saturation levels in the tissue.

This technology also offers improved detection of tumors in the brain. Since aggressive tumors tend to have a rapidly growing network of blood vessels with frequent microhemorrhages, SWI's sensitivity to venous blood and blood products makes it possible to detect these hemorrhages and identify the boundaries between the tumor and healthy tissue. This imaging technique also has the capacity to capture changes in blood flow within the brain caused by tumors or aneurysms. It may be the future in determining the status of a brain tumor and predicting its expansion into the surrounding tissue.

It has already proven useful in detecting abnormalities in patients with Sturge-Weber disease when conventional MRI methods revealed none.

While iron content in the basal ganglia of the brain is normal, SWI can indicate abnormal iron content levels in this area of the brain linked with Alzheimer's Disease or other neurodegenerative disorders. It promises to be an extremely useful tool in identifying multiple sclerosis by detecting lesions and demonstrating the presence of iron in the gray matter.

This new imaging technology offers medical professionals and researchers more precise and well-defined images of the brain that could prove useful in the diagnosis and treatment of brain injury and neurological disorders. We hope to hear more from Wayne State and other centers about this exciting new breakthrough in medical imaging. ❖

References:

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SWI *continued*

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