HARRIS ORTHOPAEDICS AND SPORTS MEDICINE

Magnetic resonance imaging (MRI)



What is an MRI?

Magnetic resonance imaging (MRI) is a test that uses a magnetic field and pulses of radio wave energy to make pictures of organs and structures inside the body. In many cases, MRI gives different information about structures in the body than can not be seen with an X-ray, ultrasound, or computed tomography (CT) scan.

For an MRI test, the area of the body being studied is placed inside a special machine that contains a strong magnet. Pictures from an MRI scan are digital images that can be saved and stored on a computer for more study. The images also can be reviewed remotely, such as in a clinic or an operating room. In some cases, contrast material may be used during the MRI scan to show certain structures more clearly; this is called an MRI arthogram.

Related Docoments: A Patient's Guide to MRI athrogram

Why It Is Done

MRI is used to find the cause of ongoing, unexplained joint pain, swelling, or abnormal movement of your joint. It may be done alone or before other tests, such as MRI arthrogram, CT, or arthroscopy.

An MRI is used to:

• Find problems in your joint capsule, ligaments, cartilage (including tears, degeneration, or disease), and the bones in the joint. In your shoulder, an MRI arthorgram is preformed rather then an MRI, it may be used to help find rotator cuff tears and the cause of a frozen shoulder.

(Photo to the right: of the low back)



How to Prepare

Before your MRI test, tell your health professional and the MRI technologist if you:

- Are allergic to any medicines. The contrast material used for MRI does not contain iodine. If you have a known allergy to the contrast material used for MRI, tell your health professional before having the test. Sometimes the benefits of having this test may outweigh the risks.
- Are or might be pregnant.
- Have a pacemaker, artificial limb, any metal pins or metal parts in your body (especially in the eyes), metal heart valves, metal clips in your brain, metal implants in your ear, tattooed eyeliner, or any other implanted or prosthetic medical device (such as a medicine infusion pump).
- Have had an accident or work around metal. This increases the possibility that you have metal fragments in your head, eyes, skin, or spine. An X-ray may be taken first, to see if you can have the MRI test.
- Had recent surgery on a blood vessel. In some cases you may not be able to have the MRI test.
- Have an intrauterine device (IUD) in place. An IUD may prevent you from having the MRI test done.
- Become very nervous in confined spaces. You need to lie very still inside the MRI magnet, so you may need to have the test done with open MRI equipment. It is not as confining as standard MRI machines. You may need medicine to help you relax.

How to Prepare continue...

- Have any other health conditions, such as kidney problems or sickle cell anemia, that may prevent you from having an MRI using contrast material.
- Wear any medication patches. The MRI may cause a burn at the patch site.
- You may need to arrange for someone to drive you home after the test, if you are given a medicine (sedative) to help you relax.

Please be sure your doctor and the MRI staff are aware of any of these conditions. If you have any questions, be sure to ask!

What the Radiology Department Needs to Know

- Do you have diabetes or take metformin (Glucophage) for your diabetes?
- Do you have asthma?
- Are you being treated now for any kind of infection?
- Do you have a history of claustrophobia?
- Have arthritis that is bothering you at the time of your test?
- Do you have any metal in your body such as a pacemaker, aneurysm clips, artificial heart valves, hearing aids, medication pumps, dentures, orthopedic items such as pins, rods, wires, plates, and/or any shrapnel or gun shot fragments?
- For women, are you using an IUD or diaphragm, breastfeeding an infant, pregnant or suspect that you are pregnant?

How is it done?

The X-ray table may feel hard and the room may be cool. And the MRI is Very loud, but the MRI staff will give you ear plugs to help cut down on the loud noise.

A magnetic resonance imaging (MRI) test is usually done by an MRI technologist. The pictures are usually interpreted by a radiologist. But some other types of doctors can also interpret an MRI scan.

You will need to remove <u>all</u> metal objects (such as hearing aids, dentures, jewelry, watches, and hairpins) from your body because these objects may be attracted to the powerful magnet used for the test. You may be asked to wear a hospital gown if you are wearing clothes that have metal buttons/zippers; it is best to wear sweatpants type material with draw strings vs. pants with buttons/zippers. You'll need to remove any metal objects, such as jewelry, that might interfere with image results. Other things that need to be removed are credit cards or ATM cards with scanner strips on them because the MRI magnet may erase the information on the cards.

How is it done continue...

During the test you will lie on your back on a table that is part of the MRI scanner. The table will slide into the space that contains the magnet. A device called a coil may be placed over or wrapped around the area to be scanned. A special belt strap *may* be used to sense your breathing or heartbeat. This triggers the machine to take the scan at the right time.

Some people feel nervous (claustrophobic) inside the MRI magnet. If this keeps you from lying still, you can be given a medicine (sedative) to help you relax. Some MRI machines (called open MRI) are now made so that the magnet does not enclose your entire body. Open MRI machines may be helpful if you are claustrophobic, but are not available everywhere. The pictures from an open MRI may not be as good as those from a standard MRI machine. See pictures of a standard MRI machine and an open MRI machine below.

Inside the scanner you will hear a fan and feel air moving. You may also hear tapping or snapping noises as the MRI scans are taken. You may be given earplugs or headphones with music to reduce the noise. It is very important to hold completely still while the scan is being done. You may be asked to hold your breath for short periods of time.

During the test, you may be alone in the scanner room. But the technologist will watch you through a window. You will be able to talk with the technologist through a two-way intercom.

If contrast material is needed, the technologist may put it in an intravenous (IV) line in your arm. The material may be given over 1 to 2 minutes. Then more MRI scans are done.

An MRI test usually takes 30 to 60 minutes, but can take as long as 2 hours.



Standard MRI machine

Open MRI machine



How does it feel?

You will not have pain from the magnetic field or radio waves used for the MRI test. The table you lie on may feel hard and the room may be cool. You may be tired or sore from lying in one position for a long time.

 \underline{If} a contrast material is used, you may feel some coolness and flushing as it is put into your IV. In rare cases, you may feel:

- A tingling feeling in the mouth if you have metal dental fillings.
- Warmth in the area being examined. This is normal. Tell the technologist if you have nausea, vomiting, headache, dizziness, pain, burning, or breathing problems.

Risks

There are no known harmful effects from the strong magnetic field used for MRI. But the magnet is very powerful. The magnet may affect pacemakers, artificial limbs, and other medical devices that contain iron. The magnet will stop a watch that is close to the magnet. Any loose metal object has the risk of causing damage or injury if it gets pulled toward the strong magnet.

Metal parts in the eyes can damage the retina. If you may have metal fragments in the eye, an X-ray of the eyes may be done before the MRI. If metal is found, the MRI will not be done.

Iron pigments in tattoos or tattooed eyeliner can cause skin or eye irritation.

An MRI can cause a burn with some medication patches. Be sure to tell your health professional if you are wearing a medication patch.

After Your MRI

You may leave the department right after your MRI and all your questions have been answered.

Obtaining Your Test Results

The findings from your test are reviewed and interpreted by the radiologist. These results will be given to your referring doctor, who will also interpreted the reading share them with you during your follow-up visit. After your doctor has seen the condition of your joint area, further treatment with medicine, physical therapy, or surgery may be recommended.

* References available upon request