



BREAST MR IMAGING

Magnetic Resonance Imaging (MRI) is a method of imaging the human body using a powerful magnet and radio waves. X-rays are not used. To date, there are no known long-term effects on human tissues resulting from this technique. At North Shore Radiology we have been using MRI since 1996.

During MRI scanning the tissues are "excited" by radio waves, and in turn emit weak radio signals from which we can reconstruct images of the organs. MRI provides unique information because it shows the chemical nature of tissues in the body more sensitively than X-rays or ultrasound.

MR Breast lesion detection

MRI of the breast is a well established technique for the evaluation of breast lesions. On campus we have been using MRI for breast since 1995. An injected contrast agent – Gadolinium linked to a complex, biologically safe molecule (Gadolinium for short) – is used in this technique. The Gadolinium leaks from any new tiny blood vessels. These occur in rapidly growing tissue, such as cancer. With this contrast-enhanced MRI, virtually all breast cancers enhance (that is, become brighter as a result of the leaked Gadolinium). However, certain non-cancerous breast lesions can sometimes enhance just like cancers. Occasionally, even the normal glandular tissue can enhance in a similar pattern.

Because MRI is so sensitive to the presence of cancer, it has great potential to help in patients when we are unsure of the diagnosis or if we have not been able to exclude or confirm the presence of cancer. Many of these enhancing lesions need to be further assessed by percutaneous biopsy.

On occasion there is a lesion which is worrisome for cancer but which cannot be detected by any other means: examination by the breast surgeon, mammography or ultrasound, even if they are performed with the knowledge of where the MR detected lesion lies in the breast (the so-called “second-look” or focused ultrasound). In that situation, in order to biopsy the correct spot it is necessary to perform the biopsy after being guided to that spot by a short repeat MRI study. This would only be performed after discussion with the patient and the treating team on another day.

Breast MRI will often demonstrate the extent of breast cancer before surgery more accurately than other imaging techniques. Its use may thus minimise the need for repeated operations in some patients.

MRI is a complementary investigation in breast problems. It does not replace clinical examination or the other

means of investigation such as mammography or breast ultrasound. It is very important that the previous investigations and their results be available to correlate with the findings of the MRI study. **Please ensure that you bring previous examinations of the breasts to the MRI examination.**

What Will Happen To Me?

To image the breasts optimally, we use a special apparatus called a breast surface coil. On our MRI scanner this is a low padded plastic platform block with two holes in it, into which the breasts hang while you lie face down (see figure below).

A picture of the coil we use for MRI scanning of the breast. You will lie face down with your breasts hanging into the holes at the top of the coil. Your head will rest on a soft pad. The breasts are lightly compressed by plastic plates from the sides.



So that the contrast agent can be injected in mid-scan without moving you, you will have a plastic cannula placed into a vein before we start. After being positioned comfortably, you will be moved into the magnet bore head first on a sliding table.

The MRI scanner bore is equipped with a microphone and speaker, so our MRI radiographers can talk to you during the examination and listen to your responses.

You will also be given a small alarm button which you can press at any time for assistance. Rarely, some patients are

claustrophobic in the MRI unit. You must warn us of severe claustrophobia well beforehand.

During the scan, you will hear a banging noise which is normal in MRI scanning. It is important that you do not move during the “loud” periods as movement spoils the images and may make the study non- diagnostic.

After preliminary scans, you will be injected with a contrast agent into your vein. A set of scans will then be performed very rapidly and repeated several times. A final set of scans will be performed over a few minutes and the procedure will then finish. The overall time you will spend in the magnet will be up to 40 minutes. On occasion we will need to perform an ultrasound after the MRI to clarify the MRI findings. There is a lot of analysis involved in the MR Study and the second look ultrasound will usually be booked for a separate appointment, on another day.

What if I am severely claustrophobic?

If you require sedation for the scan (only if you are very claustrophobic), you will need to contact us prior to your appointment so that the appropriate booking is made. You will be required to come to the study fasted for six hours and you must have someone drive you home.

You may like to bring a partner or friend to help you through the scan; they are welcome to sit in the scan room with you and can talk to you between scan sequences.

Both you and any companion must be able to go into the strong magnet field in the MRI room. Uncommon types of surgery and electronic equipment such as cardiac pacemakers may prevent you from having a MRI. The safety questionnaire we ask you to complete will allow us to check on these.



After the scan

The information generated in this study is complex and the analysis of the information may take a few hours. It will not be immediately available. The results will be sent to your doctor.

What Can Go Wrong?

There are some problems and situations that may arise because of the MRI scan.

These include:

- A rare adverse reaction to the MRI contrast agent. Extremely rarely, a reaction may be severe enough to be life-threatening in 1 in 100,000 cases and may even lead to death in 1 in 1,000,000 cases. Any reaction to this contrast agent is, in our experience of thousands of injections, exceedingly uncommon.
- The MRI scan may not clarify the diagnosis or may even be misleading in an occasional instance.
- The MRI scan may detect a previously unsuspected abnormality. If this is the case, the findings and treatment will be discussed with you.

Conversely, the MRI scan may incorrectly be suspicious for breast cancer in a small number of cases, which could lead to an additional biopsy.

Any More Questions?

This sheet may not answer all questions for every patient. If you have any further questions about any part of the MRI scan, please ask for more information. You may think of questions later — please feel free to ask them at any time.



Cover Image >

The NSR facility. The patient lies on the MRI scanner table, to be moved into the bore of the magnet. For breast MRI the patient would be lying on their front with their head almost at the opening of the tunnel.



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