

PATIENT GUIDE TO INTERPRETING YOUR SHOULDER MRI

Edward G McFarland MD

Jacob Joseph BA

Kyubo Choi

Why this guide to MRI of the shoulder?

We are writing this guide to help patients understand the MRI report which they often get from the radiologist. We have found that these reports are confusing for patients as the MRI often lists many things which may or may not have anything to do with the patient's symptoms or problem. We have created this guide to reassure them that many of the findings on the MRI reported by the radiologist are just things people get as they get older and may not be anything to worry about. However, any findings that are of a concern to you should be discussed with your doctor. This guide is not intended as a substitute for you speaking with your doctor.

What exactly is an MRI?

MRI stands for "Magnetic Resonance Imaging" and is a type of radiology evaluation which does not involve radiation like plain x-rays and computed tomography (CT scans). An MRI consists of a large circular magnet which creates images of the tissues in the body without radiation. While plain x-rays show bones very well (Figure 1), MRI shows the soft tissue around the bones and joints (Figure 2). The bones in your body meet at joints where they are held together by tough tissues called ligaments which run from one bone to another. The joint also has muscles around it which when they contract or squeeze to make the bone move. The muscles attach to the bone via tendons which are specialized to attach the muscle to bone.

In the shoulder there are many muscles around the joint but the ones of interest are the "rotator cuff." These are a set of muscles which start on the shoulder blade but attach to the arm bone (the humerus) by tendons (see "Patient Guide to Rotator Cuff Tendinitis). The rotator cuff tendons are fairly thick tendons (about as thick as your little finger) and wide (each one about as wide as three of your fingers). There is one rotator cuff tendon in the front of the shoulder (the subscapularis), one on the top (the supraspinatus) and two in the back of the shoulder (the infraspinatus and the teres minor). These tendons as they attach to the humerus

to form a “cuff” of tendons. As opposed to plain x-rays, MRI can let you see the rotator cuff muscles and tendons whereas x-rays cannot.

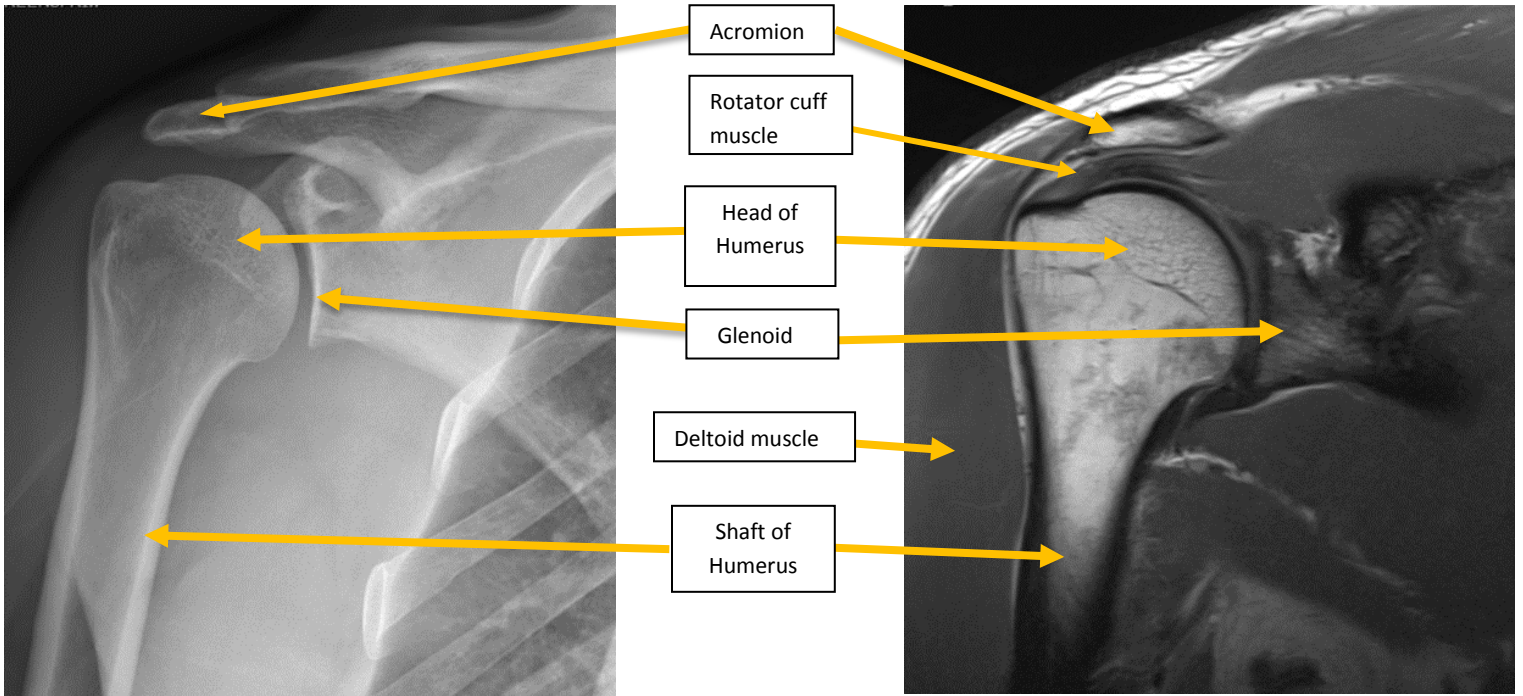


Figure 1. The example of shoulder plain x-ray shows bones very well.

Figure 2. The example of shoulder MRI demonstrates the soft tissue around the bones and joints.

Why would I need an MRI?

For many shoulder conditions the diagnosis of what is wrong with your shoulder can be made with a good history and examination of the shoulder. The first test which should be done by your provider to assess shoulder problems is a plain X-ray of your shoulder. We recommend regular radiographs be obtained and evaluated before an MRI is ordered. While occasionally some physicians order an MRI before obtaining regular x-rays, it is good practice to first get a regular x-rays as they are good for detecting fractures, arthritis or abnormal bones in the shoulder. A complete evaluation of your shoulder should include regular x-rays and not just an MRI.

How does the radiologist read the MRI?

The radiologist gets the scan on the computer and the MRI images show them different parts of the shoulder in slices. In other words, the scan is like cutting cheese in that they do not see the whole block but rather see only slices. These slices can be made to see structures from the front, the side or from the top. Each slice will show parts of the shoulder but no one slice tells the whole story. As a result, the images that the radiologist sees on the screen have to be put together in their minds to come up with an idea of what is normal and what is not. This of course takes a lot of training and shoulder MRI is known as being particularly difficult to read by radiologists. The reason for this is that the tendons and other soft tissue in the shoulder joint are complex, so not many slices cut through the structures more than a couple times. Fortunately the MRI scan can make images from different angles which gives more information to the radiologist. The radiologist looks at the images in the scan and then they describe what they see on the scan.

How does the radiologist know what is causing my problem or my symptoms?

The radiologist will look at all the structures in your shoulder MRI and describe what they see. The radiologist cannot tell if what they see is causing your symptoms or not. As a result, just because the radiologist sees some changes on your MRI it does not mean that those changes are the cause of your pain or your symptoms. The radiologist is obligated to describe what they see, so often they will comment in the report that “clinical correlation is recommended.” This means that while they see the abnormality, the doctor examining and treating you has to determine if what they see is actually the cause of your problem.

This is where reading the MRI report of your shoulder gets tricky. The report has to record any abnormality whether it is important or not, so many shoulder MRI reports sound as if your arm is going to fall off. It is important to realize that the radiologist is only reporting what he sees on the film and to not get concerned about every finding.

Also often the radiologist is not one hundred percent sure of what they see as they are only seeing certain slices of the shoulder joint. As a result, they will often report “possible lesion” or “possible tear” or “probable tear.” Whether or not the changes are important should be discussed with your physician.

Lastly, another issue with an MRI is that many structures in your shoulder change as you get more mature. These changes can be seen in your MRI. While these changes are no longer “normal,” they may be normal for your age. The radiologist is obligated to comment on these changes even though they may have nothing to do with your symptoms.

How do I know what to worry about and what not to worry about?

The ultimate way to know what to worry about is to speak with your doctor either on the phone or in an office visit. This guide aims to also help you to a certain extent understand what the radiologist means by certain phrases or diagnosis in their reports.

What about tears of the rotator cuff?

First we recommend you read a ***Patient Guide to Rotator Cuff Tendinitis*** and also a ***Patient Guide to Partial Rotator Cuff Tears*** which have a lot of important information about your rotator cuff. Those two guides will help you understand the language used to discuss your rotator cuff such as “tendinosis,” “partial tear” and “full tear.”

It is essentially normal for the rotator cuff tendons to age with the rest of your body, so that by the time you are 30 years of age the changes due to age alone in the tendons can be seen on an MRI of the shoulder. These changes are called “tendinosis” and these changes in the tendons increase every year you are alive. These changes of tendinosis are difficult to tell apart from partial tears of the rotator cuff tendons (see below).

Partial tears of the tendons are also a normal part of “maturity” and so we rarely operate upon partial tears. Partial tears are best thought of as partially rubbing through a rope so that while there is fronds of the rope hanging down it is not cut all the way through. Partial tears become increasingly common with age. Studies have shown that if you do MRI’s on the shoulders of people over 65 years of age who have never had problems with their shoulders, over 50% of people studied will have tendinosis or partial tears of the rotator cuff.^{1, 2} The radiologist will frequently read the tendons as “tendinosis or partial rotator cuff tear,” and these findings are usually normal in most instances. While some partial rotator cuff tears might cause symptoms, in most instances they are nothing to worry about.

What about a full tear of the rotator cuff?

Full tears of the rotator cuff can occur two ways. First is a traumatic tear where you fall and tear the tendon off the bone where it attaches. This is usually associated with immediate pain and maybe weakness of the shoulder. The second way it tears is that it wears out like a hole in the seat of your pants; it gradually gets thinner and thinner until there is a hole there. This kind of attritional or wear a hole type of tear is often without symptoms at all. These tears where a hole is worn in the tendon over time comes in all sizes and shapes, but they typically begin bothering you after doing too much exercise or some new activity or sometimes for no good reason. Generally speaking tears that are wear and tear type tears (also called “attritional”) occur without an injury and take years to develop.

How to treat full tears of the rotator cuff is beyond the scope of this guide (see ***Patient Guide to Rotator Cuff Tendinitis***). However, there are many factors which are considered when deciding what to do about full thickness rotator cuff tears. These include (1) the size of the rotator cuff tear, (2) the number of tendons torn, (3) if it is the dominant or non-dominant arm involved, (4) whether there is any pain or not, (5) the activity level of the person with the tear, (6) whether it keeps you from doing some activity you want to do, (7) your age, (8) the probability of the tendon healing with surgery (See a ***Patient Guide to Failed Rotator Cuff Surgery***), (9) how much the muscles have atrophied and (10) your general health. We put all of these things in a balance and decide what is best for each person. When you read your radiology report this may help you know what to consider with your physician. Not every full thickness rotator cuff tear needs surgery, so while the radiologist may report a full thickness tear, there is much more to making decisions about treatment depending upon the factors listed above.

What about a torn labrum?

To understand this diagnosis you should first read a ***Patient Guide to Labrum Tears***. The second thing you need to do is to realize that labrum tears also can be a normal consequence of aging. These labrum tears associated with aging rarely cause symptoms and do not need to be treated.

The second thing to consider is that labrum tears are very difficult to read on MRI's because the labrum is small and not very many slices can be made in through it. As a result, the radiologist has to determine if there is a labrum tear in only one to two (and at most three) slices. The radiologist will often say "possible labrum tear" or "labrum tear cannot be ruled out."

A suspected labrum tear is a very common finding on shoulder MRI and again the finding has to be understood based upon your symptoms and your history. To date no study has demonstrated that labrum tears lead to arthritis of the shoulder, so even if there is a labrum tear on the MRI you should not get too concerned until addressing it with your doctor

Labrum tears that cause symptoms in the shoulder are typically found in athletes involved in overhead sports, such as baseball players and tennis players. These labrum tears are at the top of the socket and are called "SLAP" lesions (i.e. Superior Labrum Anterior Posterior lesions). These types of labrum tears are typically treated without surgery initially.

There is another second kind of labrum tear seen when the shoulder has been dislocated out of the shoulder socket (See Patient Guide to Shoulder Instability). These tears are located in the bottom half of the socket. Sometimes the labrum appears like the shoulder has dislocated even though it has not been dislocated. Unless you have symptoms that your shoulder is coming out of the socket (subluxating or dislocating), this too is probably not an important finding.

What about arthritis of my acromioclavicular (AC) joint?

One MRI study done on people with no problems with their shoulders found that over the age of 30 years old almost every person had MRI findings of arthritis of the AC joint.³ As a result, the finding of AC joint arthritis means that you have a normal shoulder if you are over the age of 30. Fluid in the AC joint itself is also very common and does not mean that the AC joint needs any surgery. However, another study found that on MRI if there was fluid in the bones next to the AC joint (the acromion bone and the end of the collarbone) that over 80 % of people actually had symptoms due to the AC joint arthritis.⁴ Most of the time AC joint problems can be treated without surgery. Please refer to the ***Patient Guide to the AC Joint***

What about cysts in my shoulder on MRI?

There are two kinds of cysts in the shoulder area. The first are “degenerative cysts” in the bone of the arm (humerus) or the socket bone (glenoid). These are entirely normal and can be present as early as the age of 15. These cysts are areas in the bone which are about the size of a pea or less which have fluid in them, like tiny balloons inside the bone. These do not grow or get bigger and do not cause any symptoms of pain. If your MRI says you have degenerative cysts it is essentially a normal finding depending upon your age.

The second kind of cyst is also very common and is seen around the joint lining where the labrum is attached. This type of cyst is seen in a variety of joints, especially the wrist and the knee (where it is called a Baker’s cyst). They are little fluid filled sacs which can be as small as a pinhead or as large as a plum. They rarely cause symptoms unless they get very large. The symptoms of large cysts include pain, weakness and atrophy of the muscles. Unless they are causing these symptoms, synovial cysts around the joint are not treated and do not cause problems. It is uncommon to need to operate on these very often and most can be ignored.

What things should I worry about in my shoulder MRI?

There are few things in the shoulder that can maim you for life or kill you except tumors and infections. There are two kinds of tumors in the shoulder: benign and malignant. If the radiology report says that it cannot tell if the lesion is benign or malignant, usually another MRI is recommended within a few months to see if the lesion is growing or changing. However, if you have any question about a lesion and how it should be treated you should contact your doctor.

Shoulders do not get infected very often but when they do the MRI will typically show fluid (pus) in the joint and in the tissues around the joint. If your MRI says you might have an infection you should contact your doctor right away, and if you are feeling sick you should go to the nearest emergency room.

What if I do not understand the reading of some other part of the MRI?

It is very difficult to know everything about shoulder MRI or the conditions around the shoulder. We recommend you consult your doctor for questions if there is something you do not understand. Another option is to look at the Patient Guides on our website. The internet has a lot of information about shoulder conditions but that information is not always accurate. The main thing to realize is that the reading of your shoulder MRI is what the radiologist sees on the images and often those findings may have nothing to do with your symptoms. Only a history and physical examination can put the findings of an MRI into perspective and to determine if treatment is necessary.

References

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