



# The Lumbar Disc Bulge

## How important is this finding ?



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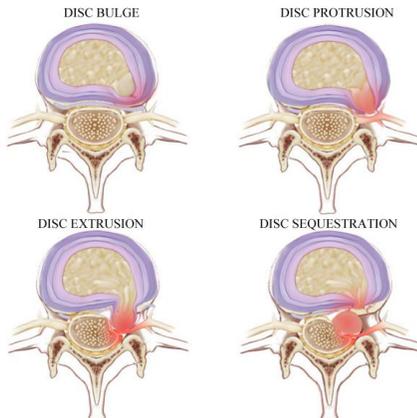
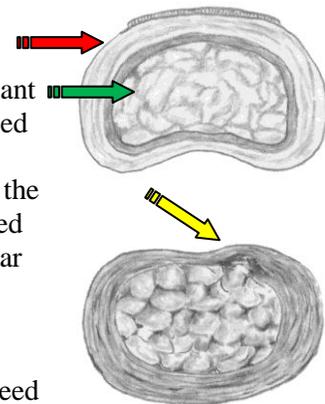
### INTRODUCTION:

I have the opportunity to consult patients with chronic neck and back pain every day of my career. It is rather common during the initial introduction to the patient for them to quickly declare “I have 7 herniated disks”. This statement is made like some kind of “badge of honor”. Regardless of how many disc herniations they declare that they have, this statement more than likely means that they have had disc bulges or protrusions identified on an MRI study obtained at sometime during the course of their journey through seeking answers for their back or neck pain. The big question is whether or not these findings of disc bulges or protrusions on MRI are important. Are these bulges or disc protrusions identified on the MRI the cause of the pain or associated disability? Even more interesting is why there are some individuals so “proud” of such a finding identified on the MRI? This article will discuss the topic of identifying a disc bulge on MRI and whether or not this finding is of critical importance. We will also address why some individuals cling to the diagnosis based on MRI findings.

### BASIC ANATOMY:



As we have addressed in numerous articles on this website the intervertebral disc has 2 basic component. The first is a series of laminated rings on the outside of the disc which provides significant structural support. These readings noted by the red arrows is called the annulus fibrosus. The Center of the disc contains complex proteins that produced a fatty-like substance within the Center of the disc. This is noted by the green arrows on the picture above. This area is called the nucleus pulposus. Over time the annulus of the disc begins to wear allowing the nucleus of the disc to push through the weekend annulus and produce a bulge. (Noted by yellow arrow)



There is some nomenclature that you will need to be familiar with. A disc bulge is a focal area of bulging noted on the disc. A disc protrusion is a focal area of bulge as noted in the picture to the right. A disc extrusion is where nuclear material has torn outside the annulus extruded into the central canal but has remained intact to the disc. A disc sequestration is when the nuclear material extruded from the disc and brakes free floating up or down often impinging against the nerve root.

## DIAGNOSTIC IMAGING IN SPINE PAIN PATIENTS:



Contained in various articles on this website I have addressed topic such as the annular fissure, annular tears, disc herniations, facet joint dysfunction and instability, and a myriad of other topics that may pertain to the production of low back pain. With the technological development of the CAT scan and later in the early 90s the MRI scan physicians have had the capacity to image the spine in patients with and without pain. In the process of obtaining these incredibly complex images of the spine

multiple pathological findings can be identified which includes various degrees and types of degenerative disc disease, changes to joints, narrowing of passageways where the spinal cord and nerves traversed through. Physicians are faced on a day-to-day basis with trying to sort out which of these findings are important and may pertain to the patient's symptoms and which are not. These findings on MRI are often interpreted by physicians, chiropractors, and other healthcare practitioners and can be misinterpreted based on the individuals background and specific educational bias. Findings on diagnostic imaging are commonly interpreted by physicians, surgeons and other practitioners and it is common place for many to relate the diagnostic findings to the patient's symptoms. Many individuals undergo interventional procedures including spinal surgery for these findings even though they may not be the actual source of the patient's pain. This can lead to failed back surgical syndrome where the patient's condition remains the same or becomes worse after surgery. This can also lead to unnecessary repeated interventional procedures such as epidural blocks, etc. when these procedures may be inappropriate. The question is whether or not you can interpret the importance of the presence of the disc bulge or protrusion in the patient is presenting with pain. First let us look at the literature discussed below.

## MRI FINDINGS IN ASYMPTOMATIC INDIVIDUALS:

Multiple studies have been performed performing MRI studies in the spine of asymptomatic individuals. The purpose of this is to determine whether or not specific findings that we often interpret as important on an MRI really is or is not a critical finding that we can correlate to a patient's symptoms. Individuals that have been completely pain-free have been noted to have disc bulges, protrusions or herniations on MRI scans and CAT scans.<sup>1-8</sup> If so many individuals can be identified with disc bulges or protrusions that are completely asymptomatic, the next logical question would be whether or not this is a risk



factor or a predisposing factor for developing a problem in the future? Studies have shown that that is not the case. Masui and his colleagues followed individuals who were treated conservatively for symptomatic disc herniations. After a period of time they did MRI studies at 2 years and 7 years. At this 7 year period of time on individuals demonstrated progressive disc degeneration; however, there was no predictive correlation between MRI findings and the continuation of pain.<sup>9</sup> They noted individuals treated successfully that were pain-free still had the presence of herniated disks! The conclusion of the study was that clinical outcome did not depend on the size of the herniation or the greater degeneration of the intervertebral disc and the minimum 7 year follow-up.<sup>9</sup>

Multiple studies have been performed by evaluating MRI studies on asymptomatic individuals as previously stated. One study demonstrated 20% of asymptomatic individuals under 60 have MRI evidence of disc herniations and 37% over the age of 65 that are asymptomatic have the presence of a disc herniation.<sup>2</sup> In the prestigious New England Journal of Medicine Jensen and Modic noted that 52% of

asymptomatic individuals demonstrated a disc bulge on MRI and 27% demonstrated a disc protrusion.<sup>1</sup> They also noted that out of their patient population they studied that were completely pain-free 14% had annular tears, 8% had facet joint arthritis and 7% had spinal stenosis yet were still asymptomatic.<sup>1</sup>

What about in high-risk occupations and individuals? Do individuals that have jobs or physical activities that involve frequent bending, twisting, heavy lifting and other high risk exposures have a greater incidence of disc bulging and thus symptomatic back pain? In a study in 1995 76% of asymptomatic high risk individuals had at least one disc herniation/protrusion or extrusion on MRI. 13% of these individuals have a severe herniation or disc extrusion and yet were still asymptomatic. 17% of these individuals demonstrated compromise of the nerve root which suggests the disc herniation approached the nerve root or disc placed the nerve root. 4% of these individuals still asymptomatic demonstrated a major compromise of the nerve root which means the nerve root was compressed and still the individuals were asymptomatic.<sup>1</sup> In these asymptomatic individuals 85% demonstrated degenerative disc disease at at least one level. The importance of this study is that disc herniation alone does not equate to low back pain and/or leg pain. The problem with MRI studies is the high false positive rate. Studies have shown that false positive rates can range from 24% to as much as 53%! More importantly the findings of protrusion, bulge, extrusion or even sequestration has a false positive rate of 60.5%!<sup>1-4,10</sup>

### WHAT DOES THIS ALL MEAN?

First of all we need to be careful about how we interpret the importance of the presence of a disc bulge or protrusion. One more interesting bit of research statistics just to finalize appointment. Another researcher found 37% of 20-year-old individuals and 96% of 80-year-old individuals have the presence of disc bulge with no symptoms. 29% of individuals at 20 years of age and 43% of those over 80 had disc protrusions. The prevalence of annular fissure was 19% at age 20 and 29% by the age of 80.<sup>11</sup>



What all of this means is that it takes a medical detective to sort out the complexities of the patient with back or neck pain. Patients presenting with back and neck pain are actually extremely complex and the subspecialty disciplines in medicine that are faced with the task of sorting this out need to employ a multidisciplinary effort and it is helpful to have a multidisciplinary background. This requires significant time on

the task which means that often times medical consultations with patients require a significant amount of time. The process of consulting patients with back pain can be a daunting task which requires often times significant time set aside for consultation. This is why it is common place for us to spend an hour and a half and sometimes more on an individual just for the initial consultation. In addition, advanced diagnostic workups are often required far beyond simple MRI or CAT scans. One needs to be able to sort out and correlate the patient's history, type, character, location, frequency and duration of pain with a very careful physical examination. The physician then needs to use the MRI to read the "clues" like in detective to see which of the findings if any identified on the MRI are important. We commonly see individuals with multiple disc protrusions that have no pain rising from the protrusions at all but rather pain arising from their sacroiliac joint or the facet joints or other sources of pain.

### WHY DO SOME INDIVIDUALS "CLING" TO THE DISC BULGE DIAGNOSIS?

I consult patients every day who have been on a journey. They have consulted countless physicians, allied healthcare practitioners, physical therapists, etc. They have received countless methods of treatment without benefit. They begin to wonder if people judge them and think they are crazy and making this up and their head. And then... an MRI study is performed demonstrating one or many disc bulges. The individual with chronic back pain or neck pain is living a nightmare and finally they have found some "objective evidence" that they actually have pain. This may be worsened by the fact that

some physicians will try to blame their symptoms on a MRI findings such as a bulging disc and further explain that since the patient has failed conservative efforts and is not a surgical candidate there is nothing more that can be done. So, when an individual begins a medical consultation stating "I have multiple herniated disks" this is simply a statement saying I have pain and I have a reason for it. It is typically my job to start the educational process and make a determination as to whether or not these findings noted on MRI are of critical importance or not.

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