



## **Damage – The potential vs the actual**

**“an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”<sup>(1)</sup>**

There it is again. Our pain definition. I'm coming back to it today for a good reason, to look at the relationship between tissue damage and pain.

Or the lack thereof.

I'm going to focus on something most of us know.

Back pain.

I am making the assumption that anyone reading this has either had experience with back pain, or knows someone who has. If you haven't, then you must be living under a rock. Or are a rock, in which case well done for being able to read this article.

Back pain affects up to two thirds of the adult population at some point during their lives<sup>(2)</sup>. As you can imagine, this means that back pain has a fairly heavy cost on the healthcare system<sup>(3)</sup>, especially with increased use of diagnostic imaging to help with diagnosis and treatment. As you can imagine, scans such as MRI's find all sorts of tissue changes in and around the spine. This can often lead to medical and sometimes surgical interventions to alleviate these symptoms.

With varying effectiveness.

It has prompted in recent years a push to reserve spinal imaging for those who fit the criteria for serious pathology (ie. someone who is unlikely to improve with timely medical intervention, normally pathology impacting on the spinal cord). Despite this many people who experience persistent pain continue to undergo scanning, usually at least an X-Ray. This isn't necessarily an issue, depending on how any results are communicated to you as the patient once you receive them.

### **Issues in the Tissues**

The main issue with imaging isn't with the search for a particular pathology, it's when it is done to look for *pain*.

**“an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”**

We've already touched a bit on how pain and damage do not correlate very well. So simply searching for some sort of abnormality as causing pain becomes a bit problematic. Pain can be experienced with and without actual damage to the tissues, but it works both ways. Damage can also be seen in the tissues with very little symptoms.

If there is something there, is it really causing the pain?

How do we know it hasn't been there for longer than the pain, and is therefore having little effect on it?  
Everything needs to be taken in context.

Here is a table people might find interesting:

### Prevalence of imaging findings in asymptomatic patients

Imaging Finding	Age (yr)						
	20	30	40	50	60	70	80
Disk degeneration	37%	52%	68%	80%	88%	93%	96%
Disk signal loss	17%	33%	54%	73%	86%	94%	97%
Disk height loss	24%	34%	45%	56%	67%	76%	84%
Disk bulge	30%	40%	50%	60%	69%	77%	84%
Disk protrusion	29%	31%	33%	36%	38%	40%	43%
Annular fissure	19%	20%	22%	23%	25%	27%	29%
Facet degeneration	4%	9%	18%	32%	50%	69%	83%
Spondylolisthesis	3%	5%	8%	14%	23%	35%	50%

Brinjikji, W..... (2015). Systematic literature review of imaging features of spinal degeneration in asymptomatic populations. *American Journal of Neuroradiology*, 36(4), 811-816. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4464797/>

What we see above is a table of imaging results from investigations conducted on asymptomatic individuals. These are people who have *no symptoms*. Yet we see what we see above.

Two of most interesting lines to me are 'disc degeneration' and 'disc bulge'.

The very first part of the table shows that 37% of people in their 20's have disc degeneration. 37%! That's more than a third. Your first thought might be that this a lot of people with degeneration, but it should really be this:

*Surely there isn't 37% of the 20-year-old population with limiting back pain?*

And you'd be right, because there isn't. Remember, all of the people in this study had no symptoms.

No pain.

So that means 37% of young people have degeneration and no pain. 30% of them have a disc bulge. Still no pain.

If we move up the other end 96% of 80-year-old have disc degeneration, and 84% have a disc bulge. Now obviously as you get older these would be more common, but remember, these people are *asymptomatic*. Even if they weren't, I'm sure 96% of 80-year-olds don't have crippling back pain.

So what's going on?

It comes back to threat.

As we've seen, whenever the body produces a pain experience, it feels there is a threat or potential danger. Which means what is actually going on structurally is only part of the picture. If you have disc degeneration in your spine, yet your body doesn't see this as a threat, why would it be worth you experiencing pain? The same would go for any disc bulge.

Quite often, if these changes happen slowly over time, then they may be seen as less threatening than something like a sudden spinal fracture, so pain is a less likely outcome.

Now that isn't to say that someone who has degenerative change of the spine, or a disc bulge, won't experience pain. It's more saying that having any of these things listed on the table show on imaging does not guarantee that is the *reason* you have pain.

### **Strange Diseases**

While I'm on the topic, I thought it would be worth touching on something which I see occasionally come through. I would have thought this would no longer be happening, but it still seems to, and I think it is quite misleading.

And that is the diagnosis of 'Degenerative Disc Disease'.

Occasionally someone comes up with an X-Ray report which has this diagnosis on it. Less than there used to be, but it still happens.

Firstly, *this is not a real thing*.

By that I don't mean degeneration doesn't happen, I just mean that it's not a *disease*.

Calling it a disease implies that it is abnormal, dangerous and likely to worsen.

You know what it is? Normal.

It is generally the normal aging of the spine. Look at the table above. 37% of 20-year-olds have degenerative discs, and that gets higher as we get older. Over this time, natural changes occur due changes in stresses on the spine and the body's response to these. Most of the time this doesn't result in pain.

The big problem I have with it is this. If you were someone who has had a bit of niggling back pain, or even some ongoing back pain, and you have an X-Ray which gives you this diagnosis, how might that affect your pain? Is it going to help? Not likely. What it might do is make you worry, it might make you change the way you move, or even develop a fear of hurting it further. If we look back at the way the brain is involved in pain, do you think it might now seem more of a potential threat?

I would think so.

I'm not saying the information isn't helpful sometimes, but it needs to be explained well and understood, often so you don't think your back is worse than it is. As Dr Stuart McGill (the Canadian Professor of Spine Biomechanics, not the cricketer) once said:

**“A ‘degenerative disc disease’ diagnosis is the equivalent of telling your mother-in-law with wrinkles that she has “degenerative face disease!”<sup>(5)</sup>.**

I feel it would be a brave (or foolish) person to do so.



**If you *do* use that line on your mother in law, don't appeal to me<sup>(6)</sup>.**

### **Further *Disc*-ussion**

Talking about ‘discs’ is probably a bit of a misleading thing in this context. In most people’s minds, intervertebral discs are quite delicate structures which, with the slightest wrong movement, may explode inside your spine in a shower of squishy goo.

I think this is partly due to the way we (myself included in the past) have described them with bad analogies.

Blown-up water balloons or jam donuts being common ones

They are much stronger than this (though I’m not sure whether they are tastier than jam donuts). Most drawings show discs sitting between the vertebrae in a sort of loose fit. In reality, they are firmly integrated with adjacent vertebrae, and are made of similar material to your ear along with some super strong ligament<sup>(7)</sup>. This means they aren’t delicate at all, and if you’ve seen people playing sport, particularly, Olympic weightlifters in action, it’s easy to see that.

They also heal just like other tissues, albeit a bit more slowly. Generally, they are always a bit tatty around the edges, and age-related changes are often indistinguishable from injury changes (7). There is a better nerve supply in the surrounding tissues than the disc itself, so danger signals are more likely to come from irritation of these tissues.

### **Back on Track**

Ok, coming back from that tangent (people who have seen would know I love a good tangent), let's talk more about the damage/pain scenario.

I've talked a lot about the back today, but this applies to many areas of the body. The shoulder is another area where we see significant tissue damage, often with little to no pain symptoms. It has been shown that structural changes are quite common in asymptomatic people<sup>(8)</sup>, and one study found asymptomatic shoulder abnormalities were found in 96% of the subjects<sup>(9)</sup>, which is a *lot*.

Now that we know all about pain, tomorrow I want to look at what we can do to *improve* pain...

## References

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