

## An Effective, Minimally Invasive Way to Treat Chronic Lumbar Pain

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Once in a while, a research paper comes along that is potentially game-changing. One [such paper](#) may change our view of chronic back pain treatment.<sup>1</sup> A group of Chinese medical doctors (Peng, et al.) conducted a placebo-controlled study in which they took a group of 136 patients with chronic lower back pain and MRI evidence of degenerative disc disease and performed discograms on them. They first excluded patients with lumbar disc herniation, canal stenosis, spondylolisthesis, instability, disc degeneration with endplate Modic changes, inflammatory arthritis, neurological disease, tumor, infection, or depression. As any good researcher should, they were very careful, very specific with their selection of patients, attempting to have a tight criterion to determine who would be the optimal candidates.

They performed a discogram on the 136 candidates, determining that 72 patients had a concordant response, thus confirmed to have discogenic pain. In this study, they divided the patients with positive discograms in half. The 36 in the treatment group were injected at the time of the discogram with methylene blue (MB), a chemical/dye commonly used in medicine and surgery. The placebo group got a saline injection and a local anesthetic into the disc.

They found 72 patients with a positive discogram, proven to have true discogenic pain. In this study, they divided the patients with positive discograms in half. The treatment group was injected at the time of the discogram with methylene blue (MB), a chemical/dye commonly used in medicine and surgery. The placebo group got a saline injection.

Here is where the results start to get amazing. In the treatment group, Oswestry scores decreased by 35.58 points out of 100. Pain levels dropped by half. Satisfaction rates were 91.6 percent. There were no adverse effects or complications in the treatment group. The results lasted at two-year follow-up. In comparison, the placebo group had minimal changes.

In a discogram, a radio-opaque dye is injected into the nucleus of the disc, usually at the level of suspicion and above and below. The doctor watches how the dye is distributed, looking for evidence of tears, looking at whether the dye is contained in the nucleus or spreads either specifically along fissures or broadly through into the posterior annulus. The more important result is the patient's experience during the discogram. Does the procedure reproduce the patient's typical pain? If so, this is considered concordant pain. As Peng, et al., explained in an [earlier 2007 article](#), "The only feature of these painful discs that is distinctive from other asymptomatic degenerated discs is the positive pain response during discography."<sup>2</sup>

Nicolai Bogduk wrote a [commentary](#) on their 2010 article.<sup>3</sup> He states, "Peng, et al., announced astounding results, unprecedented and unrivaled in the history of research into therapy of chronic

discogenic low back pain." He goes on to say, "For ridding the world of back pain, this study would be worthy of nomination for a Nobel Prize; if the results are true."

The mechanisms by which methylene blue provides long-lasting pain relief are somewhat speculative. It is injected intradermally for intractable, [idiopathic pruritis ani](#).<sup>4</sup> Methylene blue injections, combined with procaine, were used on victims from a large Chinese earthquake in 1987 for [pelvic fracture pain](#).<sup>5</sup>

Peng, et al., stated in their [2007 article](#), "Theoretically, if a drug or chemical compound could destroy the nerve endings or nociceptors ingrown into the painful disc along the tear, the rational treatment of discogenic low back pain should be aimed at disrupting the pathway of nerve conduction. Intradermal MB injection has been shown by electron microscopy to be able to destroy dermal nerve endings."<sup>2</sup> In the [discussion section](#), they state, "The underlying mechanisms of a prolonged effect may include that MB destroys nerve endings or nociceptors within discs, sustains action ascribed to the absence of blood vessels in the disc, and alleviates inflammatory response by inhibition of vasodilatation. Further evidences are required to clarify the accurate mechanisms of efficacy of intradiscal MB injection."<sup>2</sup>

They also note the [lack of side effects](#) or complications: "Although MB might leak into the spinal canal through annular tears, no side effects or complications were discovered in the group of patients treated with intradiscal MB injection. We presumed that MB may act only on nerve endings or nociceptors, because no evidence of nerve root injury was found."<sup>2</sup> They note the [long-lasting effect](#) of the single therapy and state, "Patients who respond to RX typically obtain relief within 24 hours, which is compatible with gradual denervation of the disc. This denervation appears to be enduring, for once established, the relief persists for two years."

Could the results be due to a long-term effect on inflammation within the annulus? I'll quote Bogduk's comments: "Methylene blue is an inhibitor of nitric oxide-induced guanylate cyclase and nitric oxide has been implicated in inflammatory processes of disc degeneration and discogenic pain."<sup>3</sup>

Discogenic lumbar pain is notoriously difficult to diagnose and has no gold standard of treatment. I suspect that many of our patients suffer from this or have this condition as a contributor to their problem. One of the issues is that the gold standard of diagnosis for discogenic back pain is the discogram, which continues to be controversial. Beside the question of accuracy, newer research tells us that [discograms increase the rate of degeneration](#) of previously normal discs.<sup>6</sup> If you poke a hole in a disc, bad things are likely to happen.

Carragee, et al., state, "Modern discography techniques using small gauge needle and limited pressurization resulted in accelerated disc degeneration, disc herniation, loss of disc height and signal and the development of reactive endplate changes compared to match-controls. Careful consideration of risk and benefit should be used in recommending procedures involving disc injection." Since Carragee's study was published, I have become very hesitant to recommend a discogram, as the test clearly does have potential for harm, and therapy for discogenic lower back pain has not been clear-cut.

Lots of patients have bulged or herniated discs without pain. In others, we don't really know if the bulged or herniated disc is the source of their pain. Vanharanta and other researchers attempted to establish a low-tech procedure to replace or at least guide the discogram, using [vibration over the](#)

[spinous processes](#) to determine if tenderness over the lumbar spinouses correlated with MRI and discogram results.<sup>7</sup> As far as I can determine, this research never gained much traction or led to a standard diagnostic procedure. I found their research fascinating, however, and it does correlate with the midline tenderness I find in patients that I suspect of having discogenic lumbar pain.

Who are these folks who suffer from discogenic lower back pain? The pain is usually achy, deep and hard to localize. They can have constant 8 to 10 level pain on a visual analog scale. Others are pain-free while moving, but have pain on sitting or standing. They may or may not have referred lower extremity pain, and any distal pain is usually limited to the buttock or hamstring area. These patients rarely get completely well. They develop inhibition and/or atrophy to their inner core muscles, which can be seen on an MRI (although rarely reported) and tested with functional testing. This inhibition is most likely an effect of the chronic pain.

Peng, et al., hypothesize that discogenic pain is a result of the body's unsuccessful attempts to heal the fissures and tears that occur in the degenerated disc. They are attempting to look at the histological changes, reflecting the difference in the biochemical and epigenetic response in the symptomatic degenerated disc versus the asymptomatic disc; degenerated or not. They looked at discs that were removed in various surgeries. They compared the discs that were causing pain to those that had degeneration but were not painful, and to normal discs. In a [paper from 2006](#), they stated, "The distinct histologic characteristic of the disc from the patient with discogenic low back pain was the ingrowth of vascularized granulation tissue along torn fissures, extending from the external layer of the annulus fibrosus into the nucleus pulposus."<sup>8</sup>

The procedure presented by Peng, et al., does not require new or fancy surgical equipment; nor does it introduce a new expensive medication. Discograms are not cheap, but they are widely available with existing technology.

If these results stand the test of time, how will this affect us as chiropractors? I don't really know. First, this is almost certainly not a cure for all back pain. Facet joints will still get jammed, sacroiliacs will still remain unstable or fixated, the core will still function poorly in those who sit all day, or are injured. However, if chronic lumbar discogenic pain can actually be solved, it will be great for many of our chronic pain-suffering patients. For surgeons, this study, if confirmed, will have to change surgical decision-making. Fusion hopefully will be used less frequently and artificial discs will be more limited in their application.

I also hope that this study will encourage all of us as practitioners to remember that pain itself is a huge part of the problem. We are trained to look at anatomy and to respect imaging. This study reminds us, by looking at the apparent anatomic similarity of asymptomatic and symptomatic discs, that our understanding of pain generators is still in its infancy. We all have a lot to learn.

## References

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JULY 2010