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Treatment modalities for lumbar herniated discs that cause sciatica

Abstract

Sciatic pain can be caused by herniated discs in the lumbar and sacral region, and can range in level, depending on the severity of the herniation. The severity of pain and of the herniation will dictate the proper course of treatment methods that are best for the patient. Yet, the disc herniation in sciatica does not always lead the patient to suffer from sciatic pain, however most often a disc herniation does cause some level of pain. At times the impingement of the piriformis muscle is sufficient to create the same symptomatic pain flaring that is felt in disc herniated sciatic cases. Most patients with sciatic pain will find relief within six weeks of onset, however for those that don't find relief there is a variety of different modalities that exist for pain alleviation. The differing modalities make treating sciatic pain more cumbersome. Patients must navigate multiple specialists, to determine the source and root of the sciatic pain, before the proper course of treatment can be determined. Depending on the severity of the root cause, treatment modalities can range from something as simple as dermal analgesics, to something as severe as invasive surgical procedures. It is advisable for the patient to seek medical advice from a general practitioner, whom will delineate, which other specialists are of most need. Multiple approaches will be examined in this paper such as conservative treatments and invasive treatments.

Keywords: sciatica, sciatic treatment modalities, herniated disc, disc extrusion, total disc replacement, lumbar discectomy, piriformis muscle, piriformis syndrome, herniation, conservative, invasive, corticosteroid, steroid injections, saline injections

Volume 2 Issue 1 - 2016

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Received: December 6, 2015 | **Published:** January 12, 2016

Abbreviations: DDD, disc degenerative disease; PLDD, percutaneous laser disc decrompression; TDR, total disc replacement; MRI, magnetic resonance imaging; HNP, herniated nucleus pulposus

Introduction

Sciatica is a commonly used term to indicate pain radiating from the lower back into different locations in the legs and feet; these may include pain generated from the inguinal to femoral regions as well. Sciatica is also commonly referred to as radiating leg pain, along with back pain, and a disability that can be commonly converted into a pain scale from (no pain) 0-100 (worst pain).[1] Sciatica can be caused due to nerve impingement at the lumbar-sacral nerves, and/or muscular entrapment to the piriformis muscle. Another coined term used to describe disc herniations is disc degenerative disease (DDD), and radiculopathy is more specifically defined as leg pain that causes sensory and/or motor deficits and is based on preoperative examinations.[2] "Lumbar disc herniation, defined as protusions of disc material that go outside the confines of the annular lining, is a common condition that affects the spine in young and middle-aged adults and is one of the leading causes of lower back pain and sciatica".[3] The first approach to treatment in sciatic patients is the use of conservative treatments, which commonly include: the use of dermal analgesics (pain numbing), reduction in activity, rest, physical therapy, chiropractic care, pharmacotherapy, medications, and alternative medicines, along with saline injections, or steroidal epidural injections at its' most severe.[3] If the conservative approach is of no relief, then more invasive procedures such as total disc replacement (TDR), or percutaneous laser disc decrompression (PLDD) can be called for.[4] By no means are those the only two methodologies; however they pose some of the most commonly done procedures. The most commonly used invasive treatment is epidural injections and it is thus far the most effective for short-term treatment for sciatica.[5] The level and severity of sciatic pain is dependent on the actual damage and/or impingement in the nerve of the lumbar or sacral spine. The sciatic nerve can be impinged in various locations throughout the lumbar and sacral regions, and at times can even be impinged due to gynecological complications in females, or due to muscular entrapments at the piriformis muscle. According to Peh & Renius[6] the sciatic nerve may be entrapped where it crosses the sharp inferior edge of the piriformis muscle as it leaves the pelvis-the so-called "piriformis syndromes". The cause of such an entrapment in the piriformis syndrome could be caused by prolonged squatting, immobility, hip surgery, intramuscular injections, etc.[6] A rare entrapment of the sciatic nerve could also be due to endometriosis, one such case was cited in a Case Study, where the sacral nerve was entrapped causing sciatic nerve pain of which had been misdiagnosed for quite some time until a Magnetic Resonance Imaging (MRI) demonstrated its true cause.[7] Yet another female gynecological Case Study assessed that the lumbosacral trunk is actually susceptible to pressure from any abdominal mass from the uterus and/or ovaries that could impinge the sciatic nerve.[8]

Most often sciatica symptoms due to lumbar disc herniation recede within 6 weeks to a non-disabling level,[4] however for a select few that do not attain full recovery the treatments below proceed intomonths and years depending on severity. According to Peul et al.[9] the international consensus of treatment of sciatica is to resort to surgical invasive procedures if the patient has not displayed recovery of the symptoms of radiating leg pain after at least 6weeks of conservative therapy, some wait as long as 6months of conservative therapy. This particular paper attempts to explain the various treatment modalities available to those suffering from lumbar spine disc herniations that can cause sciatica pain. The level of severity will dictate whether the individual will need invasive or non-invasive treatment modalities.

So will the type of sciatic impingement or entrapment that they may be suffering from. In nerve impingements the lumbar sacral vertebrae seem to play a more concerning role, however in entrapments of the nerve near the piriformis muscle, it seems that the muscular system is playing a far greater role than the disc herniations. So depending on which type of disturbance to the sciatic nerve is causing the symptoms, it will be in all likelihood a different treatment, and in the case where the sciatic nerve is both impinged by a disc herniation and also entrapped by the piriformis muscle, then the treatment will be more prolonged, because it will have to treat both a skeletal issue and a muscular one as well. Often times, invasive treatments may be referred during disc herniations, but are inconsistent with the severity of the herniation. Due to this it is wise to seek opinions from multiple Healthcare Practitioners such as: Primary Care Physicians, Neurologists, an Anesthesiologist Pain Management Physicians, Chiropractors, Occupational Therapists, & Physical Therapists.

Invasive procedures vs. non-invasive procedures

Invasive procedures: Epidural injections are considered one of the most commonly used invasive treatments for lumbar disc herniations and radiculitis, however there effectiveness has been called into question and lack of specific regulatory measures in the study design and in its use have made it difficult to validate as effective.[5] In a 121 randomized patient study at a private interventional pain management practice the treatment of lumbar disc herniations with steroid containing epidural injections versus non-steroidal epidural injections, it was noted that a significant margin of steroidal injected patients averaged a higher relief of back pain even after two-years after onset of symptoms with a 50% or more reduction in pain.[5] According to this very same study incorrect needle placement due to lack of fluoroscopic use might have played a role in lack of improvement. A higher rate of success is associated with epidural steroidal injections that are giving to individuals with a shorter duration of sciatica symptoms, and a higher percent of compromised disc canal compression.[10] None-the-less the use of saline injections also reduces the pain from lumbar disc herniations.[11] The use of fluoroscopic-guided epidural injections increases the opportunity for the needle to make an effective penetration of the affected area and thereby aid in the true treatment of the herniation since it goes into the correct epidural space. As a patient of epidural injections, this author would strongly advise against having this procedure done by anyone other than an Anesthesiologist specialized in Pain Management or a Pain Management Physician, or Neurologist, utilizing fluoroscopic guided techniques in the treatment of sciatica. It is inadvertently dangerous to consider any invasive procedure without proper technological use to guide the treatments effectiveness. The fluoroscopic guided technique increases effectiveness of targeting the right location, and limits endangering any other portion of your spine that is currently unaffected by the herniation. It is a technique that is meant to narrow the location of where the needle needs to be inserted to the parameters of where the herniation truly is found.

Even though corticosteroid epidural injections have been cited to show an increased pain management success rate than just saline epidural injections, the corticosteroid epidurals only demonstrate a short-term treatment for the relief of leg pain and disability, with a long-term use of pain medications and other physical therapeutic treatments.[1] The age of the patient is also an important factor in the treatment with invasive or non-invasive procedures. The younger the individual the more likely invasive procedures will be offered, due to the increasing pressure of time constraints and life activities the patient and their family wishes for them to resume. In more severe cases of herniated nucleus pulposus (HNP) where the disc slipped out of place, an even more invasive treatment than epidural injections is the use of total disc replacement (TDR).[2] TDR is advised to be a last resort, after atleast 6months of conservative therapy including epidural injections was reported.[2] Unfortunately, not every physician waits the precautioned 6months of conservative therapy, however it is advisable to look at all other alternative treatments before resorting to any such invasivesurgery as TDR. Another minimally invasive treatment other than disectomy (removal of disc), is the use of percutaneous laser disc decompression (PLDD) as a modality that relieves the intradiscal pressure by delivering laser energy to the nucleus pulposus and causing vaporization of the water content of the pulposus that reduces pressure.[4] This treatment is far less damaging than the TDR, because it leads to less damage at the muscles, bones, ligaments, and nerves. It is still an invasive treatment, but does not contain the same amount of contraindications associated with TDR. Non-invasive treatments: HNP is a very common cause of lumbar disc herniations, however other than the epidural steroidal injections which are considered a part of conservative treatment, two other factors compose a solid conservative treatment, which include: activity modification, and medications.[3] The initial treatments to lumbar disc herniations include the conservative treatments and rest, physical therapy, activity modifications, alternative medicines, pharmacotherapy, massage, chiropractic care, etc.[3] It is important to note that the treatment of lumbar disc herniations is truly an individualized approach, that needs to be evaluated by multiple Professionals and the improvement or lack thereof of the patient needs to be considered. Some people respond well to the conservative approach, others rely on more invasive procedures to find relief. Whatever your need may be, it will be reliant on the steps taken in the process of finding pain relief. A case study of 283 patients conducted to determine the overall effect of conservative treatment versus invasive treatment, concluded that no overall significant difference could be found in the disability score measured after one year after either surgical (invasive), or conservative treatments.[9] According to the study regardless of grouping in conservative or grouping in invasive modalities, after one year's completion there was an average of 95% perceived recovery from both groups.[9] Regardless of whether the procedures where surgical or non-surgical as long as you sought treatment, there was a marked improvement. One thing is true though; as a patient one must follow-up all possible leads and then sit down to assess what is the best choice for your lifestyle, current need, and situation. It is never wise to just rely on one Physicians diagnosis, at best get no less than two opinions before you rely on the diagnosis, and then further follow-up after treatments to ensure the improvement is either permanent or becoming the new norm. To properly care for oneself after invasive and/or conservative treatments, it is of utmost importance to keep track of your records, to store all viable documentation so that it can be evaluated by multiple physicians and you can feel more comfortable with the action plan created for you during and after treatment.

Acknowledgements

None.

Conflict of interest

Author declares that there is no conflict of interest.

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