



# Management of sciatica: a shared-decision

Haley N. N. Moulton, Jon D. Lurie

Dartmouth-Hitchcock Medical Center, Lebanon, NH, USA

Correspondence to: Jon D. Lurie. Dartmouth-Hitchcock Medical Center, 1 Medical Center Drive, Lebanon, NH 03766, USA.

Email: [jon.d.lurie@dartmouth.edu](mailto:jon.d.lurie@dartmouth.edu).

Comment on: Ramaswami R, Ghogawala Z, Weinstein JN. Management of Sciatica. *N Engl J Med* 2017;376:1175-7.

Received: 28 February 2018; Accepted: 13 March 2018; Published: 26 March 2018.

doi: 10.21037/amj.2018.03.13

View this article at: <http://dx.doi.org/10.21037/amj.2018.03.13>

How to best manage sciatica is not a simple question to answer. Ramaswami, *et al.* presented the case of Mr. Winston, a 50-year-old patient with low back pain radiating into his L leg with positive nerve root tension signs and a left-sided L4–L5 herniated disk (1). In managing Mr. Winston's sciatica, Dr. Ramaswami poses two options: to have surgery or to not have surgery. Given the details of the case presented, Dr. Ghogawala argues that the highest quality patient-outcomes data supports the choice of microdiscectomy, and surgical intervention will provide the most rapid relief of his symptoms. On the other hand, Dr. Weinstein argues that nonsurgical treatment would be most effective for Mr. Winston given the risks of surgical complications, and the potential benefit of exercise-based physical therapy, epidural steroid injections, or nonsteroidal anti-inflammatory medications.

Both Drs. Ghogawala and Weinstein are right. There is no single answer for how to best manage sciatica, but rather each patient's unique circumstance creates a different "right" answer. While surgery can rapidly improve debilitating symptoms, patients can also experience significant improvement with nonsurgical interventions. When choosing between surgery and nonsurgical therapy there are important trade-offs. Electing to have surgery is an effective treatment option for many patients. However, while a discectomy is a relatively common and safe procedure, there is still some risk of potentially disabling complications (2). Choosing a nonsurgical option carries minimal risk, but may be less effective. So which is the right option? How do we balance these trade-offs?

The decision of how to weigh these trade-offs is often *not* best made by a physician; it is a decision often best made by the well-informed patient in partnership with their

physician. Even if a patient meets criteria and is a candidate for discectomy, deciding whether or not to undergo surgery is a patient-centered, preference-sensitive decision (3). The best method of care is to engage a patient, such as Mr. Winston, in a shared decision-making (SDM) process.

Unfortunately our current patient-outcomes data is based on large clinical trials, and we do not have many tools to present and apply this complex data to patients in a personalized way (4). However, if a patient shares his or her goals, fears, and preferences for treatment, and if a physician explains the risks and benefits associated with each treatment option, together they can reach a decision that best suits the patient's preferences and values. Only after this SDM process is it possible to decide which treatment option to recommend for a patient. Only after a patient has been armed with knowledge about all the options available to them through an SDM-based conversation is the patient in a position to weigh the trade-offs between surgical and nonsurgical treatment. Providers cannot decide upon a treatment regimen based on a simple clinical vignette. Providers need to engage in SDM with their patients and make treatment recommendations personalized to each patient's preferences and values.

If there is no single best recommendation we can suggest to our patients, what information can we provide definitively? Presenting comprehensive, balanced data to patients is difficult because there is significantly more research and information regarding surgical interventions. The Spine Patient Outcomes Research Trial (SPORT), Maine lumbar spine study, and Weber randomized controlled trial all demonstrate that compared with those who had non-surgical therapy, patients who underwent discectomy not only had greater improvements in pain

and function one year later, but also these improvements continued to last even 8–10 years after surgery (5-7). In subgroup analyses of long-term outcomes from SPORT, those with sequestered fragments on MRI, those with higher levels of baseline back pain accompanying their radiculopathy, those with greater than 6 months of symptoms at baseline, and those who were neither working nor disabled at baseline showed a greater relative advantage from surgery (8). Although the risk of experiencing complications with microdiscectomy is low, that risk is not zero. While uncommon, dural tears (3%), wound infections (2%), and nerve injury (0.1%) were documented in SPORT patients (5). More common is the risk of requiring additional surgery; in SPORT the re-operation rate for disk herniation was about 6% at 1 year and 15% at 8 years (5), and the Maine lumbar spine study reported re-operation rates as high as 25% (6).

Far less research has been conducted on long-term improvements with non-operative care, but there is evidence that lumbar radiculopathy due to an intervertebral disk herniation can spontaneously resolve within three months of symptom onset (9). While there are a variety of non-surgical options such as physical therapy, NSAIDs, or epidural steroid injections, there is not clear evidence that these more conservative approaches reduce symptoms (10). However, some studies have shown that NSAIDs demonstrate some improvement compared with placebo groups (11), and epidural steroid injections provide short-term pain relief although the long-term response is unclear (12). In a placebo-controlled trial of epidural steroids versus saline injection for sciatica, epidural steroids provided short-term symptom relief but no long-term benefit (13). However in a trial of patient with lumbar disk herniation randomized to immediate surgery versus epidural steroid injection, half the patients in the epidural group avoided surgery with similar outcomes between the two groups at 1–3 years (14). Similar results were found in SPORT and the Dutch Sciatica Trial; of patients with disk herniation who meet rigorous criteria for surgery who are randomized to additional non-operative treatment, about half are able to avoid surgery with similar long-term outcomes between the group that got surgery initially and those who either responded to non-operative treatment or later crossed over to surgery (15,16). Despite being a frequent recommendation, there is no strong evidence to support the efficacy of physical therapy for lumbar radiculopathy in systematic reviews (10); however in SPORT, receipt of physical therapy as part of the non-operative treatment regimen was associated with a lower rate of cross-over to

surgery in the non-operative group (17).

The decision for how to best manage sciatica all comes down to the patient. For a patient that is unable to manage and tolerate his or her symptoms, who is experiencing a decreased quality of life, and who is looking for a treatment that will provide the fastest relief—perhaps surgery may be the right choice for them. For the patient that is able to manage their symptoms with the use of analgesics and non-operative interventions, perhaps their radiculopathy will resolve over time, and surgery would not be the right choice for them. As Mirza and Goodkin point out, the intention-to-treat analysis of SPORT, while difficult to interpret with regards to the effectiveness of surgery compared to non-operative treatment due to high degree of cross-over, does provide useful insight into the ability of informed patients to choose the most appropriate treatments for their particular situation (18). The randomized treatment assignment in SPORT may be considered as a surrogate for the physician's recommendation for one treatment path or another. Despite being good candidates for surgery, many patients assigned to surgery improved prior to receiving it and opted out, while others, also good candidates for surgery, were assigned to non-operative treatment but eventually decided to override the recommended treatment course and have surgery. Both intent-to-treat groups had equally good outcomes, suggesting that patients were able to choose a treatment course that worked for them independent of the recommended treatment course.

In Mr. Winston's case, he is not able to currently manage his symptoms, which have persisted for 10 weeks, and he is out of work. He is reasonable candidate for discectomy which has a high expected success rate and in fact surgery was found to be particularly effective relative to non-operative care in those patients who were not disabled but were temporarily unable to work (8). Surgery would be expected to provide rapid improvement in his symptoms with low risk. However, he is hesitant about undergoing an invasive surgical procedure. He has some medical comorbidities which likely increase his surgical risk compared to the average. He has not tried an epidural steroid injection or physical therapy, which may improve his ability to manage his symptoms in the short term. If he tries additional non-operative treatment now, fails to improve and then decides to have surgery later, there is strong evidence to suggest his outcome will not suffer due to the delay in surgery (16). The best course of action is to engage Mr. Winston in SDM, and empower him with knowledge that will allow him to adequately assess the trade-offs of treatment options so that he feels confident in selecting the

treatment that is best for him.

## Acknowledgements

**Funding:** The work was supported in part by the Multidisciplinary Clinical Research Center in Musculoskeletal Diseases at Dartmouth, which is funded by NIAMS (P60 AR062799, A. Tosteson, PI).

## Footnote

**Provenance and Peer Review:** This article was commissioned and reviewed by the Section Editor Ai-Min Wu (Department of Spinal Surgery, Zhejiang Spinal Surgery Centre, Orthopaedic Hospital, The Second Affiliated Hospital and Yuying Children's Hospital of Wenzhou Medical University, The Key Orthopaedic Laboratory in Zhejiang Province, Wenzhou, China).

**Conflicts of Interest:** Both authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/amj.2018.03.13>). Dr. Lurie reports personal fees from Spinal, outside the submitted work. The other author has no conflicts of interest to declare.

**Ethical Statement:** The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

**Open Access Statement:** This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

## References

- Ramaswami R, Ghogawala Z, Weinstein JN. Management of Sciatica. *N Engl J Med* 2017;376:1175-7.
- Omidi-Kashani F, Hejrati H, Ariamanesh S. Ten Important Tips in Treating a Patient with Lumbar Disc Herniation. *Asian Spine J* 2016;10:955-63.
- Veroff D, Marr A, Wennberg DE. Enhanced support for shared decision making reduced costs of care for patients with preference-sensitive conditions. *Health Aff (Millwood)* 2013;32:285-93.
- Pearson AM, Lurie JD. Surgical versus nonoperative treatment: how do we choose the right approach to lumbar disk herniation? *Pain Manag* 2014;4:247-9.
- Lurie JD, Tosteson TD, Tosteson AN, et al. Surgical versus nonoperative treatment for lumbar disc herniation: eight-year results for the spine patient outcomes research trial. *Spine (Phila Pa 1976)* 2014;39:3-16.
- Atlas SJ, Keller RB, Wu YA, et al. Long-term outcomes of surgical and nonsurgical management of sciatica secondary to a lumbar disc herniation: 10 year results from the maine lumbar spine study. *Spine (Phila Pa 1976)* 2005;30:927-35.
- Weber H. Lumbar disc herniation. A controlled, prospective study with ten years of observation. *Spine (Phila Pa 1976)* 1983;8:131-40.
- Kerr D, Zhao W, Lurie JD. What Are Long-term Predictors of Outcomes for Lumbar Disc Herniation? A Randomized and Observational Study. *Clin Orthop Relat Res* 2015;473:1920-30.
- Saal JA, Saal JS. Nonoperative treatment of herniated lumbar intervertebral disc with radiculopathy. An outcome study. *Spine (Phila Pa 1976)* 1989;14:431-7.
- Luijsterburg PA, Verhagen AP, Ostelo RW, et al. Effectiveness of conservative treatments for the lumbosacral radicular syndrome: a systematic review. *Eur Spine J* 2007;16:881-99.
- Rasmussen-Barr E, Held U, Grooten WJ, et al. Non-steroidal anti-inflammatory drugs for sciatica. *Cochrane Database Syst Rev* 2016;10:CD012382.
- Joswig H, Neff A, Ruppert C, et al. The Value of Short-Term Pain Relief in Predicting the Long-Term Outcome of Lumbar Transforaminal Epidural Steroid Injections. *World Neurosurg* 2017;107:764-71.
- Arden NK, Price C, Reading I, et al. A multicentre randomized controlled trial of epidural corticosteroid injections for sciatica: the WEST study. *Rheumatology (Oxford)* 2005;44:1399-406.
- Buttermann GR. Treatment of lumbar disc herniation: epidural steroid injection compared with discectomy. A prospective, randomized study. *J Bone Joint Surg Am* 2004;86-A:670-9.
- Weinstein JN, Tosteson TD, Lurie JD, et al. Surgical vs nonoperative treatment for lumbar disc herniation. The Spine Patient Outcomes Research Trial (SPORT): a randomized trial. *JAMA* 2006;296:2441-50.
- Peul WC, van Houwelingen HC, van den Hout WB, et

- al. Surgery versus prolonged conservative treatment for sciatica. *N Engl J Med* 2007;356:2245-56.
17. Fritz JM, Lurie JD, Zhao W, Whitman JM, Delitto A, Brennan GP, Weinstein JN. Associations between physical therapy and long-term outcomes for individuals with lumbar spinal stenosis in the SPORT study. *Spine J* 2014;14:1611-21.
18. Mirza SK, Goodkin R. What patients know. *Surg Neurol* 2008;70:5-7.

doi: 10.21037/amj.2018.03.13

**Cite this article as:** Moulton HN, Lurie JD. Management of sciatica: a shared-decision. *AME Med J* 2018;3:43.