

Low Right Care

Reducing Overuse and Underuse

Overuse of Interventional Procedures for Low Back Pain

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Patient perspective by Helen Haskell and John James

Case Scenario

A 48-year-old former construction worker presents for a comprehensive evaluation. The examination does not reveal a history of cancer, trauma, or fever, and the neurologic examination findings are normal. Five years earlier, the patient began having low back pain when lifting heavy materials, and his physician prescribed nonsteroidal anti-inflammatory drugs, a muscle relaxant, and physical therapy. However, the patient was unable to return to work. When his symptoms did not improve, he underwent spinal radiography and magnetic resonance imaging, which showed a small herniated lumbar disk. The patient was referred to a pain management specialist and had three epidural injections that did not improve his symptoms. He was then referred to a spine surgeon and underwent a lumbar laminectomy that did not result in significant improvement. The patient is still unemployed and would like to discuss further therapy with you. His surgeon recommends spinal fusion, but the patient has concerns after reading about the procedure and its risks.

Clinical Commentary

The estimated lifetime prevalence of low back pain is as high as 60% to 80%, making it one of the most common reasons patients visit a primary care physician.¹ Fortunately, only 10% of patients with acute low back pain develop chronic pain lasting longer than three months.² Chronic low back

pain is associated with significant financial, social, physical, and psychological impacts. Back pain is one of the leading causes of disability worldwide and one of the top reasons for absence from work.^{1,2} After diabetes mellitus and cardiovascular disease, back pain is the third most expensive chronic condition to treat, with an estimated annual cost of \$87.6 billion in the United States.³

Low back pain is most commonly caused by muscle sprains and strains, which are associated with more than 70% of all back pain diagnoses. Lumbar spondylosis is the next most common etiology, causing approximately 10% of cases, especially in older patients. Disk herniations can occur at any age and cause back pain in 5% to 10% of patients. Vertebral compression fractures and spondylolisthesis are associated with less than 5% of low back pain cases. Spinal stenosis is associated with 3% of cases but is one of the most common diagnoses leading to surgery.⁴

A history and physical examination should guide diagnostic studies with attention to findings such as a history of malignancy, fever, infection, trauma, bladder or bowel incontinence, or abnormal neurologic symptoms or physical examination findings.^{2,5,6} Unnecessary testing and overdiagnosis are associated with increased morbidity and subsequent disability.^{2,5,6} Imaging studies should be avoided for at least six weeks following the onset of symptoms unless red flags are present.⁷ Early magnetic resonance imaging has been shown to increase unnecessary surgeries, recovery time, and medical expenses with no significant improvements in function, pain, or other clinical outcomes.⁸

In contrast, a multidisciplinary and multimodality approach, including pharmacologic and nonpharmacologic therapies, produces the best outcomes.^{2,5,6} A comprehensive approach to care may include pharmacologic management with nonsteroidal anti-inflammatory drugs, muscle relaxants, anticonvulsants, and judicious use of opioids when indicated.^{2,5,6,9} Nonpharmacologic approaches include physical therapy, osteopathic manipulation, acupuncture, behavior modification, mindfulness-based stress reduction techniques, weight loss, yoga, and exercise therapy.¹⁰⁻¹²

Low Institute Right Care Alliance is a grassroots coalition of clinicians, patients, and community members organizing to make health care institutions accountable to communities and to put patients, not profits, at the heart of health care.

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CME This clinical content conforms to AAFP criteria for CME. See CME Quiz on page 582.

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TAKE-HOME MESSAGES FOR RIGHT CARE

A methodical and comprehensive approach to the evaluation of back pain reduces inappropriate early imaging (< 6 weeks since pain onset).

A conservative and integrative approach to treatment that avoids most interventional procedures is often appropriate.

Interventional procedures and back surgery have limited effectiveness for back pain and should be avoided, except when there is a concern for loss of neurologic function.

Patients with failed back surgery syndrome should undergo spinal fusion procedures only when there are no other options to preserve neurologic function.

When pain persists despite pharmacologic and noninvasive nonpharmacologic methods, the next modality is epidural injections.^{5,6} The evidence for using epidural injections to treat low back pain is weak, with only one-third of patients experiencing any significant improvement and even less benefit in patients who have had back surgery or previous injections.^{13,14} The long-term benefits of injection therapy for improving pain and mobility are even more limited, and repeat injections are almost never beneficial.^{13,14}

Surgical options should rarely be considered in the management of acute or chronic low back pain. Emergent indications for surgery include infection, malignancy, unstable vertebral fractures, or progressive neurologic symptoms suggestive of spinal cord impingement. Otherwise, surgery should be considered a last resort when symptoms have persisted for a year or more.¹⁴

Surgery for low back pain is one of the most overused procedures in the United States, with more than 1.2 million back surgeries performed every year.^{3,6} *Table 1* lists surgical options and indications from the National Institute of Neurological Disorders and Stroke, which cautions that there is little evidence to determine which procedures are superior for specific indications.¹⁵

The fastest-growing intervention for back pain is spinal fusion, with a cost of \$60,000 to \$110,000 per procedure.¹⁶ It has been estimated that only 33% of patients have satisfactory improvement after any back surgery, with 33% showing no improvement and 33% feeling worse.¹⁵⁻¹⁸ More than 50% of patients who underwent spinal fusion had no improvement or felt worse after surgery. Spinal fusions cost the U.S. health care system more than \$16 billion annually.¹⁹ Subsequent spinal surgeries are rarely associated with improvement in pain, function, or ability to return to work.¹⁹

Failed back surgery syndrome, also known as postsurgical spine syndrome, is a clinical syndrome associated with persistent symptoms of lower back pain, radicular pain, or weakness after a surgical procedure.^{20,21} The incidence of this syndrome is drastically increasing, and it is now one of the most common etiologies of chronic pain.²⁰⁻²² The condition is also associated with significant functional disability and has a significant psychosocial and financial impact.²³ Although complications from surgery

TABLE 1

Surgical Procedures for Back Pain

Procedure	Indications
Artificial disk replacement (alternative to spinal fusion)	Removal of the affected disk and replacement with a synthetic disk that helps restore height and movement between the vertebrae
Discectomy	Treatment of herniated disks
Foraminotomy	Enlargement of nerve root openings secondary to bone or disk compression
Implantable spinal cord stimulators	Blockage of pain signals to the brain
Nucleoplasty (i.e., plasma disk decompression)	Laser surgery using radiofrequency to treat mildly herniated disks
Spinal fusion	Removal of the vertebral disk with fusion of the adjacent vertebrae using bone grafts or metal and screws
Spinal laminectomy or spinal decompression	Treatment of spinal stenosis or herniated disks
Vertebroplasty and kyphoplasty	Treatment of vertebral compression fractures

Information from reference 15.

(e.g., infection, pain, bleeding, neurologic complications) are uncommon, surgery has not been shown to significantly decrease pain in most patients or increase functional ability, return to work, or patient satisfaction.^{15,16}

Management of failed back surgery syndrome may include physical therapy, medication, stress reduction, cognitive behavior therapy, acupuncture, exercise, or yoga.¹⁶ Patients with this syndrome have severe symptom burdens of neuropathic pain, muscular weakness, and deconditioning, resulting in poor quality of life and physical function.²¹⁻²³ The cycle of pain and disability often continues, and patients seek further surgical procedures out of desperation.²³ These patients become candidates for more invasive spinal fusion procedures with increased morbidity, functional decline, and disability.²⁴ The selection of appropriate patients for any back surgery is essential. Preoperative risk factors for poor outcomes after back surgery include longer duration of pain, smoking, obesity, diagnosed mental illness, and involvement in workers' compensation disputes or litigation.²⁵

An umbrella review studied the effectiveness of the 10 most common elective orthopedic procedures, including lumbar spine decompression for spinal stenosis and lumbar spinal fusion for degenerative disk disease. The study concluded that there is no high-quality evidence that these procedures are more effective than nonoperative alternatives in improving pain intensity, physical function, disability status, or quality of life.²⁶ It is essential that primary care physicians use a common sense, multimodal approach for the evaluation and treatment of low back pain that avoids interventional procedures, except in rare cases.

Patient Perspective

Your patient partners are hopelessly divided on the issue of back surgery. One of us recently had a laminectomy and is hopeful that it will benefit him over the long term. He has seen deterioration in family members that he believes could have been prevented by judicious surgical intervention, and he has friends who tell him that back surgery has given them back their quality of life. However, the other of us has seen lives wrecked by surgeries that escalated symptoms from merely painful to excruciating and debilitating. Although she fervently hopes her colleague is the exception, she cannot recall knowing a back surgery patient who reported a happy long-term outcome.

Where our opinions converge is around the concept of shared decision-making. Patients considering back surgery may be desperate for relief, but they do not usually believe they are rolling the dice. People bombarded with constant advertising, as most of us are, may be disposed to assume that medicine has a solution for everything. Patients may find it hard to believe that an intervention would even be offered if it had not been shown to confer a clear benefit. This belief may be buoyed by a surgeon who believes innately in the value of the elective procedure. In this context, it can be challenging for a discussion between surgeon and patient to overcome the optimistic assumptions brought to the table.

In the fast-paced environment of elective surgery, what passes for shared decision-making does not necessarily consist of a conversation between patient and surgeon. An example is the informed consent process one of us recently experienced. A printed compilation of 13 types of spinal surgeries with 10 possible bad outcomes was presented to the patient less than one hour before surgery. However, since the outcomes were not linked with specific procedures, this information was of no value.

Long before patients are prepared for surgery, the family physician, as a trusted independent voice, can provide the background patients need. Their conversations may involve using more balanced decision aids to help prepare patients to engage effectively in shared decision-making. The family physician can discuss the value of nonsurgical, nonpharmacologic options such as exercise as a first option, red flags that guide patient selection for surgery, the difficulty of pinpointing the causes of back pain, the known effectiveness of different back surgeries, and the risk of harm from failed back surgery. If patients decide to proceed with surgery, the family physician can assist them in choosing the best surgeon for their procedures.

Resolution of the Case

The patient presents for follow-up after seeing a spine specialist who recommended spinal fusion surgery. You have a patient-centered shared decision-making discussion with the patient. You present the clinical evidence, which suggests that spinal fusion is unlikely to improve the patient's chronic pain and has significant risks of worsening pain or decreased function.²⁶ Because the patient does not have significant neurologic impairment, further surgery is not indicated. The patient is thankful for your detailed explanation

and that you did not recommend surgery. He decides to pursue an integrative approach to care that includes yoga, exercise therapy, weight loss, and nonsteroidal anti-inflammatory drugs as needed.⁴⁻⁶ The patient's pain improves enough that he starts a new job as a supervisor at his former construction firm.

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