# Diagnosis and Management of Lumbar Spinal Stenosis

Andrew J. Haig; Christy C. Tomkins


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<thead>
<tr>
<th>Topic collections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aging/ Geriatrics; Pain; Quality of Care; Quality of Care, Other; Radiologic Imaging; Surgery; Surgical Interventions; Orthopedic Surgery; Surgical Interventions, Other; Diagnosis; Magnetic Resonance Imaging</td>
</tr>
</tbody>
</table>

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Diagnosis and Management of Lumbar Spinal Stenosis

Andrew J. Haig, MD
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EVERY YEAR AN ESTIMATED 90 OF 100 000 PERSONS OLDER than 60 years undergo lumbar fusion surgery.2 The diagnosis of lumbar spinal stenosis, defined as “a clinical syndrome of buttock or lower extremity pain, which may occur with or without back pain, associated with diminished space available for the neural and vascular elements in the lumbar spine,”2 is an important driver of the exponential increase in this procedure. Most surgeons rely on imaging for diagnosing spinal stenosis and for determining the need for surgery. However, the assumption that radiological measures confirm the diagnosis of the clinical syndrome of stenosis has been questioned. Without a clear diagnostic standard, a management strategy that minimizes the potential of harm from an incorrect diagnosis needs to be developed.

Evidence-based guidelines often use a circuitous logic in supporting imaging as the key diagnostic test for stenosis. For instance, the North American Spine Society (NASS) guidelines2 conclude that imaging is the key noninvasive test for diagnosis. The guidelines do not specify radiological criteria for stenosis and yet exclude from review any studies that do not use imaging as an inclusion criterion. Research on spinal stenosis almost always uses imaging to establish the diagnosis. However, the inclusion criterion is typically based on an opinion of a radiologist or surgeon who reviewed the images rather than some stated definition. The interrater reliability of the clinical impression is seldom established, masking clinical data is rare, and control populations are seldom included. Anatomical cutoffs relating to anterior-posterior spinal canal diameter or thecal sac diameter have been proposed as diagnostic criteria for spinal stenosis; however, these measurements are not necessarily tied to clinical evidence or statistical norms.3

Several studies have examined this issue. In one study, radiologists masked to clinical status diagnosed stenosis in 65% of magnetic resonance imaging (MRI) results performed on 32 asymptomatic volunteers.4 In another report, the relationship between clinical presentation of stenosis and measurement of anterior-posterior spinal canal diameter was statistically significant but MRI had no discriminant value in separating patients with clinical stenosis from asymptomatic volunteers.5 Among patients older than 60 years in the Framingham cohort, 47% of lumbar computed tomography studies met accepted criteria for moderate or severe stenosis.6

Another test used for spinal disorders is electromyography (EMG), although the NASS guidelines did not support the use of EMG.2 In one study, a newer quantitative EMG protocol called paraspinal mapping significantly discriminated persons with clinical stenosis from those with mechanical back pain and asymptomatic volunteers.3 In another study, 15 of 16 persons (94%) with “stenosis” on MRI but no symptoms had normal paraspinal mapping EMG, whereas 26 of 28 persons (93%) with both symptoms and stenosis on MRI had abnormal paraspinal mapping EMG.7 It appears that the clinical syndrome of stenosis may be related to pathophysiological alterations demonstrated on EMG—in contrast to MRI metrics that do not appear to distinguish the relevant lesion.

Lack of a clear relationship between imaging findings and the clinical presentation of spinal stenosis can be explained. It is possible that severe radiological stenosis relates to clinical stenosis. Also, imaging studies are conducted with patients supine, whereas symptoms of stenosis generally are precipitated by standing or walking. In these upright positions, the spinal canal can be made smaller by segmental instability, compression by soft tissue structures (facet joint cysts, ligamentum flavum, intervertebral disk, and posterior epidural fat), or venous congestion.

In evaluating older patients with suspected spinal disorders, 3 key steps should be taken: Find and treat what is not stenosis. The presence of leg pain does not necessarily mean that the clinically most relevant symptoms are the result of nerve root compression. Because mechanical back pain is ubiquitous, persons who have leg disorders ranging from diabetic neuropathy to peripheral vascular disease to polyarthritis may be misdiagnosed as having spinal stenosis. The back pain component of clinical “stenosis” may result from mechanical pain generators such as the sacroiliac joints, facet joints, hip joints,
trochanteric bursas, or gluteus medius tendons. Surgery to treat stenosis might have an inadvertent positive effect on mechanical pain generators; however, most physicians would advocate a conservative approach to these structures.

Patients with back pain may have other reversible disorders that are more important or that exacerbate the pain and functional limitations associated with stenosis. Depression, deconditioning, and obesity are frequent reversible constitutional causes of disability in persons with spinal disorders. Treatment of stenosis in persons whose activity is limited by polyarthritis, cardiopulmonary disease, or social barriers may add little to quality of life.

Second, define and treat the effects of stenosis. Compared with younger persons, older patients with disabling back pain are more compromised in most aspects of function and quality of life. However, their disability may be unrecognized because they may rate their perceived physical and mental health as similar to that of younger persons. Multidisciplinary rehabilitation is an established but often overlooked treatment for chronic back pain disability. Older patients respond positively to exercise (strength, endurance, flexibility, and coordination), counseling, lifestyle modification, and environmental modification. Some patients with neurogenic claudication will opt for adaptations such as electric scooters rather than surgery.

Third, treat presumed stenosis without a definitive diagnosis. To date only a handful of published randomized controlled trials have evaluated noninvasive treatments for spinal stenosis. However, this does not eliminate treatments: physical therapy, spinal injections, and medications should be considered.

Physical therapy is an accepted treatment for spinal disorders in general. A wide range of physical therapy–related treatments has been advocated for patients with stenosis, including exercises in lumbar flexion (cycling), body weight supported treadmill walking, aggressive walking to the point of claudication, muscle coordination training, lumbar semirigid orthosis, braces and corsets, pain-relieving modalities (heat, ice, electrical stimulation, massage, ultrasound), manual medicine treatments, and postural instruction.

 Epidural steroid injections ordinarily present minimal risk and may have potential benefit9 and may be tried before a surgical consultation is considered. One approach is to use a transforaminal technique targeted at the most clinically affected nerve root and add an injection of the adjacent facet joint to decrease inflammation of the nerve foramen wall.

For chronic back pain, medications are not the initial therapy physicians should consider. According to a comprehensive review,10 at best drugs relieve only about 30% of chronic pain. In older patients pain medications increase the risk of falls, cognitive deficits, constipation, bladder dysfunction, and adverse drug interactions. Medications are useful but should not be the primary intervention for spinal stenosis.

Time may be one of the most important treatments for spinal stenosis. Contrary to commonly held perceptions, available evidence suggests that spinal stenosis is a stable disorder.3 Patients who develop serious disability and neurological deficit usually do so over time, and the decline is not predicted by pain levels or imaging abnormalities. Accordingly, treatment choices should be based on current pain and disability, not on anticipation of future pain or complications. Insufficient research into conservative treatments has resulted in lack of clinical standards. This may cause primary care physicians and surgeons to deemphasize conservative care. Without standards for conservative care, there is a serious gap in the validity of studies that attempt to compare operative with nonoperative care. Policy makers should consider the value of research and promotion of treatments that prevent the need for operations rather than simply validating the operations.

Finally, make a positive diagnosis of stenosis. Conservative approaches for care may resolve symptoms for many patients in whom spinal stenosis is a diagnostic consideration. For the remaining patients, mechanical pain generators and unrelated causes for disability should be treated or optimized, and reversible consequences of stenosis should be managed or understood. For patients in significant distress despite physical therapy, injections, medications, and time, and for whom EMG has ruled out other causes of nerve pain, imaging is useful in planning operative care. An operation under these circumstances can be a thoughtful, deliberate intervention that should help reduce pain, increase activity, and improve quality of life.

Financial Disclosures: Dr Haig reports that through Rehabilitation Team Assessments, LLC, a company he formed, he consult with hospitals and health care systems on rehabilitation program development, including BlueCross/Blue Shield of Michigan and the Center for Healthcare Research and Transformation. Other outside interests include consulting with Best Doctors Inc and other groups on case reviews, and he advises in the development of a muscle stimulator for Mainstay Medical. Dr Tompkins reported no financial conflicts.

REFERENCES