

Revisiting An Old Topic: Lumbar Spinal Stenosis

Two orthopedic surgeons wrote an article on spinal stenosis that was published in 2004. In this article, these same two physicians revisit that topic and update information on causes of spinal stenosis, anatomy, diagnosis, and treatment. Goals of treatment and the ideal patient for each type of treatment are presented.

Spinal stenosis refers to narrowing of the spinal canal or the intervertebral foramina of the lumbar spine. The spinal cord travels down the spinal canal, so anything that narrows that space can compress the cord. The spinal nerve roots exit the spinal cord through an opening in the vertebral bones called the intervertebral foramina.

There are many anatomical changes that can result in pressure or compression on the spinal cord or nerve roots. Most of these have to do with degenerative processes linked to aging. For example, osteophyte (bone spurs) can form around the facet (spinal) joints, thereby covering up the foramina (hole) where the nerve roots exit.

The discs narrow and may even bulge. Loss of disc height compresses the facet joints together. The joints rub together and start to hypertrophy (build up tissue around them to protect them). These changes can also narrow the foraminal openings where the spinal nerve roots leave the spinal cord.

At the same time, the major ligament down the back of the spinal cord (inside the spinal canal) called the ligamentum flavum starts to thicken. There's just enough room in the normal, healthy spinal canal for the spinal cord and the ligament. A ligament that's larger than normal adds to the pressure on the spinal cord.

The combination of disc protrusion, thickening of the ligament, and hypertrophy of the facet joint creates a force on the spinal canal that can alter its shape. Instead of a nice, round opening for the spinal cord, the spinal canal gets pinched into a triangular shape. This shape is called a trefoil because it has a characteristic appearance of three overlapping rings. The term trefoil comes from the Latin for a three-leaved plant.

How do you know if you have spinal stenosis? Sometimes you don't. People with this condition can be completely asymptomatic (without symptoms). But when the problem makes itself known, it's usually in adults over age 50.

Low back pain develops with numbness, and pins and needles along the backs and sides of the thighs and legs. There is a sensation of weakness or heaviness in the legs. Walking or standing (especially standing up straight) makes the symptoms worse. Leaning forward or sitting makes it feel better.

The diagnosis is suspected by the nature of the symptoms but confirmed with X-rays, MRIs, CT scans or other tests such as myelography. Myelography is a type of radiographic examination that uses a contrast medium (dye) to detect pathology of the spinal cord. It helps show the extent of the stenosis. CT scans are better for seeing the surrounding bone and to look for bone spurs. Myelography and CT scans are also used for patients who can't have an MRI because of a pacemaker or spinal stimulator.

Sometimes, people in this age group also suffer from a condition called vascular claudication (blocked arteries to the legs with decreased blood supply causing leg pain). The symptoms are similar to claudication (leg pain or discomfort with walking) that is caused by stenosis, so the physician must sort out one from the other. Many times, older adults have both conditions at the same time, making the diagnosis (and treatment) more complex and challenging.

But once it's clear you have stenosis, then what? The first place to start is with conservative (nonoperative) care. This is the most appropriate approach for patients with mild to moderate symptoms. Since the progression of stenosis is usually slow, there's time to try conservative care. There's no need to rush into surgery, especially for older adults who have other health concerns.

Pain relief and improved function in daily activities are the main goals of treatment. These are accomplished by activity modification and rest when necessary to keep symptoms from getting worse. Patients are advised NOT to stay in bed for long periods of time. Staying active without aggravating the symptoms is the way to go. The best way to do this is to avoid heavy lifting or movements that increase the symptoms (e.g., back extension).

Wearing a soft, elastic corset to support the spine may be helpful. Rigid bracing is not advised as this only puts the spine in extension, a position that aggravates the condition. It's always best to allow the trunk (back and abdominal) muscles to do their job acting as a girdle. Wearing a binder for too much of the day can lead to spinal muscle deconditioning. Short periods of external support followed by activity is the current recommendation.

Medications to control pain and inflammation may be prescribed. A short course of Physical Therapy or chiropractic care may be beneficial. Spinal manipulation performed by either the Physical Therapist or the chiropractor can help decrease frequency, intensity, and duration of pain. Manipulative techniques must avoid putting the patient in a position of spinal extension. This type of manual decompression gives irritated nerves a break from the constant compression and loss of blood supply from pressure on the blood vessels.

Physical Therapy can also help patients recover faster with less long-term disability through the use of flexion exercises, a program for cardiovascular fitness, and both flexibility and strengthening exercises. A program of this type can increase the area inside the spinal canal and help improve blood supply to the spinal cord. Weight loss is an added benefit to any consistent exercise program. The therapist will also provide instructions regarding posture and conserving energy during daily activities.

The use of epidural injections for spinal stenosis remains a hotly debated topic. The surgeon injects a numbing agent combined with a steroid (antiinflammatory) inside the spinal canal. Some studies show that results using these steroid injections are no better than doing nothing. Others have provided evidence that the injections offer relief from spinal stiffness and pain. The authors suggest there may be a place for this treatment approach to gain control of symptoms for patients who are having an acute flare-up of the condition.

A more specific treatment with the same injection places the medication next to the affected spinal nerve instead of inside the spinal canal. This procedure is called a selective nerve root block (SNRB). It seems to have better results when used with patients who have a herniated disc as the underlying cause of the stenosis.

But if leg pain persists despite a nonoperative approach, then surgery to relieve pressure from the nerve tissue might be needed. The most common operation is a laminectomy. The surgeon removes the lamina, a portion of bone on each side of the vertebra that forms the bony arch around the spinal cord. This is usually done on both sides because just doing a laminectomy on one side often results in problems on the other side later.

A newer (less invasive) treatment has been reported. The use of an interspinous process spacer helps prevent spinal extension without removing bone. The only one out on the market right now is called the X-STOP. By placing this metal device between the interspinous processes, the spine is blocked from moving

backwards into extension. The interspinous process is the bony bump you feel along the backbone. It is a bony knob attached to the back of the vertebra.

The XSTOP is best suited for patients who have classic symptoms and MRIs that show stenosis at one or two levels of the lumbar spine. Anyone who has more severe symptoms with muscle weakness and/or sensory loss is not likely to be helped by this procedure. And for those patients who have the X-STOP implanted but still don't get relief from their symptoms, it's still possible to have a laminectomy instead.

Making the decision about who should get what treatment isn't always easy. The surgeon must take into consideration the patient's age, general health and medical condition, degree of compression, and duration of symptoms. Timing is extremely important.

Early treatment gives patients the best chance of improved symptoms and even recovery. Waiting and holding off on surgery too long can result in permanent nerve damage. Large studies show that if surgery is going to help, it must be done within the first few years before the disease progresses too far.

Philip S. Yuan, MD, and Todd J. Albert, MD. Managing Degenerative Lumbar Spinal Stenosis. In *The Journal of Musculoskeletal Medicine*. June 2009. Vol. 26. No. 6. Pp. 222-231.