

Lateral Recess (Subarticular) Stenosis

A patient guide

In brief: Lateral recess stenosis, also called subarticular stenosis, is a narrowing of a small but important corner of the lumbar spinal canal where a nerve root begins its journey towards the leg. It sits between two better-known conditions: central stenosis, which crowds the whole bundle of nerves in the middle of the canal, and foraminal stenosis, which pinches a nerve where it leaves the spine through a side tunnel. The lateral recess is the entrance zone of that side tunnel, and the nerve passing through it is the one travelling down to exit one level lower. Because of this anatomy, lateral recess stenosis tends to produce a more focal, often single-root pattern of leg pain that can still be brought on by standing and walking. This page describes the anatomy, the way the condition develops, how it is recognised on scans and in clinic, what is known about its natural course, and the evidence around the various approaches to managing it.

What makes the lateral recess different

The lumbar spinal canal can be thought of in three zones along the path a nerve root takes, a model described by Lee, Rauschnig and Glenn. The first is the entrance or subarticular zone, which is the lateral recess. The second is the mid-zone, beneath the pars and pedicle. The third is the exit or foraminal zone, the side tunnel through which the nerve finally leaves the spine. Each zone has its own boundaries and its own characteristic nerve root.

The defining feature of the lateral recess is which nerve passes through it. At any given disc level, two nerve roots are relevant. The exiting root leaves through the foramen at that level, while the traversing (or descending) root passes downwards across the disc to exit one level below. The lateral recess houses this traversing root. At the L4/5 level, for example, it is the L5 root that travels through the recess on its way to leaving the spine at L5/S1. So narrowing of the L4/5 lateral recess characteristically irritates the L5 root, even though the foramen at that same level transmits the L4 root.

This distinction matters. Lateral recess stenosis and foraminal stenosis at the same spinal level affect different nerve roots and therefore produce pain in different parts of the leg. Central stenosis is different again: it compresses the whole cauda equina and tends to produce symptoms in both legs that come on with walking and ease with sitting or bending forward, a pattern called neurogenic claudication. A disc herniation is a softer, often more sudden compressor that can press on the same traversing root but behaves differently over time. Recognising which of these is present, and at which level, is central to understanding the leg pain.

Anatomy of the recess

The lateral recess is a narrow gutter at the side of the canal. Its boundaries are described consistently in anatomical work, including the detailed sectional studies by Rauschnig. In front lies the back of the vertebral body and the disc. Behind sits the superior articular process of the facet joint, covered by the ligamentum flavum. To the side is the pedicle, which forms the outer wall. The traversing nerve root sits within this gutter before it dips down towards its own foramen below.

Ciric described the clinical picture arising from narrowing here as the lateral recess syndrome, drawing attention to a region that earlier work had tended to overlook in favour of the central canal. Measurements have since been proposed to describe a narrowed recess, including a recess height of less than about 3 mm and a recess angle of less than 30 degrees. These figures are descriptive thresholds drawn from imaging and anatomical studies rather than rules, and they are read alongside the appearance of the nerve root and the pattern of symptoms rather than in isolation.

How it develops

Lateral recess stenosis is usually a degenerative process, and a fairly characteristic triad of changes tends to crowd the recess. The dominant contributor is enlargement and osteoarthritis of the superior articular process, the part of the facet joint that forms the back wall of the recess. As this bony process thickens, it encroaches forwards onto the nerve. Alongside it, the ligamentum flavum overlying the joint thickens and buckles inwards. From the front, a bulging or settling disc adds to the narrowing. Together these three elements reduce the space available to the traversing root.

This narrowing is often intensified by degenerative spondylolisthesis, in which one vertebra slips slightly forward on the one below. The slip distorts the recess and can tighten the space around the traversing root further. Lateral recess stenosis frequently coexists with central stenosis at the same or neighbouring levels, since the same degenerative changes that crowd the recess also narrow the central canal.

How it presents

The hallmark of lateral recess stenosis is radicular pain following the distribution of the traversing root. A narrowed L4/5 recess, for instance, tends to produce L5 pain running down the outer leg towards the foot. Because a single root is involved, the pain is often more focal and one-sided than the broader, bilateral discomfort of central stenosis. At the same time, the pain can still be posture and activity related, easing with forward bending and worsening with standing and walking, which can make it difficult to separate from claudication on history alone. Numbness, tingling or weakness in the territory of the affected root may accompany the pain.

Because lateral recess stenosis so often sits alongside central stenosis, the clinical picture can be mixed. Working out which root is responsible for the dominant symptom is part of the assessment. Adjuncts that can help localise the source include a selective nerve root block, which tests whether numbing a particular root relieves the pain, and nerve conduction studies or electromyography (EMG), which can show whether a specific root is irritated. These are tools that help build a picture rather than stand-alone answers.

What the scans show

Magnetic resonance imaging (MRI) is the usual first-line investigation, because it shows the soft tissues, the nerve roots and the ligamentum flavum well. Computed tomography (CT) is valued for fine bony detail, such as the shape and overgrowth of the superior articular process, and is sometimes used to complement MRI.

Imaging of the lateral recess carries some well-recognised limitations. Bartynski and Lin compared MRI grading of nerve root compression in the lateral recess against what was found at surgery, and reported that MRI underestimated the degree of root compression in roughly 30% of cases. Splettstosser and colleagues, looking at the relationship between MRI appearances and symptoms, found that the correlation was poor, meaning that scans showing narrowing do not reliably predict who has pain and how severe it is. The practical consequence described in this work is that a scan is interpreted alongside the distribution of the leg pain rather than on its own. Grading systems such as the Schizas dural sac grade help describe the severity of central canal narrowing in a standardised way, though they speak more to the central canal than to the recess itself.

Natural history

Much of what is known about how lumbar stenosis behaves over time comes from cohorts of mixed, or composite, stenosis rather than from groups of patients with isolated lateral recess narrowing. With that caveat, the broad picture from studies such as those by Johnsson and by Amundsen is reasonably reassuring: symptoms often remain stable over years, and a meaningful proportion of people stay much the same or improve without their problem progressing inexorably. Because these are general stenosis data, they describe the wider condition rather than the specific behaviour of an isolated recess lesion, and individual courses vary.

The evidence around management

Where treatment of the recess is considered, the surgical principle described in the literature is targeted decompression that frees the traversing root while preserving as much of the facet joint as possible. The classic operation is a partial undercutting facetectomy, sometimes called medial facetectomy, in which the overhanging inner part of the superior articular process and the thickened ligamentum flavum are trimmed away from beneath, opening the recess without removing so much of the joint that the segment becomes unstable. Getty and colleagues described this undercutting approach, and Ciric's earlier work set out the rationale for addressing the recess directly.

Outcomes reported for these procedures are generally favourable. Long-term series of undercutting facetectomy have described around 72% of patients remaining free of leg pain. Minimally invasive and endoscopic transforaminal decompression techniques, which reach the recess through smaller approaches, have been reported to give good or excellent results in the region of 85 to 90% of cases in selected series. Where central stenosis coexists, a unilateral approach can be used to decompress both sides of the canal through one opening, an over-the-top technique described by Costa and others that preserves the midline structures.

A recurring question is whether a decompression needs to be accompanied by a fusion. The evidence here is genuinely divided. The Swedish Spinal Stenosis Study reported by Forsth, and the larger NORDSTEN-DS trial, found that adding fusion to decompression gave no clear advantage for patients with stenosis and a stable degenerative slip, supporting decompression alone in those circumstances. In contrast, the SLIP trial reported by Ghogawala found better outcomes when fusion was added for grade I degenerative spondylolisthesis, a result pointing the other way. Taken together, the literature describes fusion as being most relevant where there is genuine instability, with decompression alone often sufficient for a stable segment, while acknowledging that the trials do not all agree.

Outlook and the importance of the right target

When the correct recess and root are decompressed, reported relief of leg pain is generally good, in the order of 70 to 90%. The qualifier matters: results depend heavily on operating at the level and on the root that is actually responsible for the symptoms.

This is where one of the central pitfalls of the condition lies. Because lateral recess and foraminal stenosis at the same level affect different nerve roots, and because the most alarming-looking level on a scan is not always the one producing the pain, there is a real risk of addressing the wrong zone, the wrong level or the wrong root. The literature on imaging and symptom correlation underlines why matching the scan to the distribution of the leg pain, rather than treating the worst radiological appearance, is so important to a good outcome.

Common questions

What is the lateral recess?

The lateral recess is a narrow gutter at the side of the spinal canal, just before a nerve root heads towards its exit tunnel. It is bounded by the back of the disc and vertebral body in front, the facet joint and ligamentum flavum behind, and the pedicle to the side.

What does subarticular stenosis mean?

Subarticular stenosis is another name for lateral recess stenosis. The term means narrowing in the area beneath the articular process of the facet joint, which is the part of the joint that forms the back wall of the recess.

Which nerve does lateral recess stenosis affect?

It affects the traversing or descending nerve root, the one passing across that level on its way to exit one level lower. At L4/5, this is typically the L5 root.

How is this different from central stenosis?

Central stenosis narrows the middle of the canal and crowds the whole bundle of nerves, the cauda equina, often causing symptoms in both legs that come on with walking. Lateral recess stenosis affects a single root at the side and tends to

produce more focal, often one-sided leg pain.

How is it different from foraminal stenosis?

Foraminal stenosis pinches the exiting nerve in the side tunnel as it leaves the spine. The lateral recess sits further in, at the entrance, and houses a different nerve root, the traversing one. So at the same level the two conditions affect different roots.

Can lateral recess and foraminal stenosis at the same level affect different nerves?

Yes. At a single level the foramen transmits the exiting root while the recess houses the traversing root. For example, at L4/5 the foramen carries the L4 root and the recess carries the L5 root, so narrowing in each place produces different leg pain.

Why is the leg pain often one-sided?

Because the recess on one side compresses a single nerve root, the pain commonly follows that one root down one leg, rather than affecting both legs as central stenosis often does.

How does it differ from a slipped disc?

A slipped, or herniated, disc is a softer compressor that often comes on more suddenly and can press on the same traversing root. Lateral recess stenosis is usually a slower, bony and ligamentous narrowing driven by arthritis of the facet joint and thickening of the ligament.

The full set of questions and answers, with references, is available on the condition page.