

Recurrent Lumbar Disc Herniation

A patient guide

In brief: Recurrent lumbar disc herniation describes a fresh herniation of disc material at the same spinal level that was previously operated upon, occurring after a genuine pain-free interval since an earlier discectomy or microdiscectomy. It is a distinct entity from a residual or persistent herniation, where disc material was left behind or symptoms never settled, and from epidural scar tissue, the band of fibrous tissue that forms around the nerve root after any spinal operation. The distinction matters because the underlying problem, the imaging appearances and the evidence around management differ in each case. This page sets out, in descriptive terms, what recurrent herniation is, how often it is reported, what appears to raise the risk, how it is investigated and what the published evidence says about the various approaches to its management. Several of the figures quoted rest on single-centre series or industry-funded trials, and the wording throughout reflects that uncertainty.

What recurrent disc herniation is, and what it is not

The most widely used definition of a recurrent lumbar disc herniation is herniated disc material at the same intervertebral level as the original herniation, whether on the same side or the opposite side, in a person who has previously undergone a discectomy and who had a pain-free interval of at least six months since that first operation. Some authors apply a stricter definition, reserving the term "true" recurrence for material at the same level and the same side, confirmed on MRI, after a documented period free of both symptoms and treatment.

The pain-free interval is the feature that separates recurrence from the conditions it is most often confused with. A residual or persistent herniation refers either to disc material left behind at the index operation or to symptoms that never fully resolved because the original decompression was incomplete. Pain that returns within the first weeks or months after surgery is therefore more often residual disease than genuine recurrence. The minimum interval used to define true recurrence is not standardised across the literature, with six, twelve and eighteen months all in use, and this lack of a single agreed threshold is one reason the reported rates vary so widely.

Epidural scar tissue, also called peridural fibrosis, is a third and separate consideration. Scar forms naturally around the nerve root after any spinal operation. It is not, in itself, the same as a recurrent disc, and the two can produce overlapping symptoms, which is where contrast imaging becomes relevant.

How often recurrence is reported

A sensible headline figure for symptomatic recurrence after primary microdiscectomy is in the region of five to fifteen per cent, with the full published spread running from roughly two to twenty-five per cent. A narrative review of thirteen studies described recurrence rates between zero and around fourteen to fifteen per cent, with time to recurrence typically between one and four and a half years, and most recurrences occurring at the same level and on the same side.

An important caveat runs through all of these numbers: the figure quoted depends heavily on what is being counted. Radiographic recurrence, meaning herniation visible on a scan whether or not it causes symptoms, is considerably more common than symptomatic recurrence. One two-centre series of 1,214 microdiscectomy patients reported radiographic recurrence of nearly twenty-seven per cent. Reoperation, the most conservative measure of all, gives lower figures again. In the large SPORT trial, reoperation for reherniation was about nine per cent at eight years, and around sixty-two per cent of all reoperations were for same-level recurrent herniation. A Korean nationwide registry followed patients for ten years and found cumulative reoperation rising from around four per cent at one year to sixteen per cent at ten years, with recurrent herniation the dominant cause. The practical point is that radiographic recurrence, symptomatic recurrence and reoperation are different measures that can differ several-fold, so the denominator behind any single figure is worth knowing.

What appears to raise the risk

Pooled estimates of risk factors come principally from a systematic review and meta-analysis of seventeen studies, supplemented by later analyses. Effect sizes vary between populations and surgical techniques, and the factors below describe associations reported in the literature rather than certainties for any individual.

The strongest mechanical factor is a large annular defect, meaning a tear of six millimetres or more in the tough outer ring of the disc through which material has herniated. Symptomatic reherniation has been reported at around twenty-seven per cent where the defect is six millimetres or larger, against roughly one per cent where the remaining annulus is small and competent. Smoking is among the most consistent risk factors, with a pooled odds ratio of close to two and an independent association with the need for reoperation. A contained protrusion, as opposed to a fully extruded or sequestered fragment, carries a somewhat higher reported risk, since a contained disc tends to leave more nucleus behind. Modic changes, which are signal changes in the bony endplates next to the disc, appear more frequently in recurrent cases. A preserved or greater disc height, reflecting a taller, more mobile and better-hydrated disc, is also associated with recurrence.

Several further factors are more variable. Diabetes is consistently associated with recurrence in direction, though the reported magnitude is unstable across studies. Obesity and high body mass index show mixed results, not significant in some older pooled analyses but significant in some newer registry data. Age genuinely conflicts between studies: younger patients feature in the open-microdiscectomy literature, while older age is associated with recurrence in some endoscopic cohorts. Early or heavy spinal loading and an early return to demanding activity have been reported as independent predictors after endoscopic discectomy, and these are among the modifiable factors.

There is also a recognised trade-off in how much disc is removed at the original operation. Aggressive or subtotal removal of the disc does not clearly reduce recurrence compared with limited removal or sequestrectomy, while limited removal is associated with less recurrent back pain and higher satisfaction. The most robust factors are therefore a large annular defect, smoking, endplate changes and preserved disc height; diabetes, body mass index and age are more variable; and the modifiable levers most often discussed are smoking, glycaemic control, weight and the timing of heavy loading.

How it tends to present

Classic recurrent disc herniation presents after a pain-free interval, by definition at least six months and often considerably longer, with the return of radicular leg pain that is similar or identical to the original sciatica. The pattern is typically dermatomal leg pain, with or without back pain, worse with activity, accompanied by corresponding changes in sensation or reflexes. Reported pain-free intervals range widely; one series described intervals from seven to 168 months, with a mean of around sixty-one months.

Recurrence can be harder to read than a first herniation because several confounders overlap. There may be residual neurological deficit from the original herniation, there may be axial pain arising from the degenerated disc itself, and there may be peridural scar. As a general pattern described in the literature, the return of pain after a genuine pain-free interval favours true reherniation, whereas pain that never resolved or that is predominantly axial and scar-related points more towards fibrosis or what is sometimes called failed back surgery syndrome. Imaging is then used to resolve the question.

Imaging principles

The following is a descriptive account of imaging principles rather than guidance on what any individual should undergo.

Contrast-enhanced MRI, using the agent gadolinium, is regarded as the reference standard for separating recurrent disc from peridural scar. The principle rests on blood supply. On early images taken within roughly ten minutes of the injection, scar tissue enhances because it is vascularised, while recurrent disc material does not enhance early because it is avascular, sometimes showing only a thin rim of enhancement from surrounding granulation tissue. In the classic work by Hueftle, Modic and Ross, post-contrast imaging correctly characterised the abnormal epidural soft tissue in all surgically correlated patients, with accuracy rising from around eighty-nine per cent before contrast to close to one hundred per cent once contrast was added.

Timing matters because scar enhancement peaks early, at around five to six minutes, and then washes out. On delayed images, contrast can diffuse into the edge of the disc and blur the distinction, which is why early imaging is emphasised. Morphologically, a recurrent disc is described as a non-enhancing or peripherally enhancing mass that displaces the nerve root backwards, while fibrosis is described as homogeneously enhancing tissue that draws the nerve root forwards without a mass effect. In a prospective comparison, contrast MRI was substantially more accurate than CT for distinguishing disc from scar, and plain myelography could not separate the two.

CT or CT-myelography adds value where MRI is unavailable, contraindicated or degraded by metal artefact, and for assessing bone, including residual or recurrent narrowing of the lateral recess or foramen, facet joint enlargement and the adequacy of the earlier bony decompression. Dynamic flexion and extension radiographs are used to look for segmental instability before any revision, since revision surgery often involves more bone removal and a corresponding risk of destabilisation. Commonly cited radiographic thresholds for instability are sagittal translation greater than around four and a half millimetres, or fifteen per cent of vertebral body width, or sagittal angulation beyond roughly twenty degrees.

The evidence on management

Non-surgical approaches

Spontaneous resorption of a herniated disc is well documented, with a pooled incidence of around seventy-seven per cent across herniations generally, higher for extruded and sequestered fragments than for contained ones, and typically occurring within the first six months. Across lumbar disc herniation broadly, most people improve with conservative care and only a minority ultimately proceed to surgery. An important limitation is that these natural-history data come mostly from primary herniation cohorts; dedicated evidence specific to recurrent herniation is sparse, so a conservative-first approach to recurrence rests largely on extrapolation.

Epidural and transforaminal steroid injections have moderate-quality evidence for a small, short-term reduction in leg pain and disability that tends to diminish over time. Transforaminal delivery places the medication close to the inflamed nerve root, and the evidence is stronger for steroid combined with local anaesthetic than for local anaesthetic alone. Injections are symptomatic and do not reliably reduce the later likelihood of surgery. Analgesia and physiotherapy follow the general principles set out for sciatica.

Revision microdiscectomy

Where surgery is considered for recurrence, revision microdiscectomy is the most established option. Outcomes are generally good but reported as inferior to, and less predictable than, primary surgery. Good or excellent relief of leg pain is reported in around eighty-five to ninety-two per cent of revision series, though most of these are small and single-centre.

Two features distinguish revision from primary surgery. First, the risk of a dural tear, a breach of the membrane around the nerves with leakage of spinal fluid, is markedly higher because epidural scar obscures the plane between the dura, the nerve root and surrounding tissue. Reported rates of dural tear in revision range from around four to seventeen per cent, against roughly one to two per cent for primary surgery. Second, a second recurrence remains a genuine possibility; a fifty-patient repeat-discectomy series reported re-recurrence in around a quarter of cases, with about a third ultimately proceeding to fusion.

Revision discectomy alone, or with fusion

A long-standing question is whether revision discectomy should be performed on its own or combined with a fusion, such as a TLIF or PLIF, in which the segment is stabilised with implants. The evidence here is genuinely mixed and heterogeneous. A meta-analysis by Dower and colleagues found comparable functional outcomes, reoperation rates, dural-tear rates and satisfaction between repeat discectomy and discectomy with fusion, while fusion added operative time, blood loss and length of stay. A 2023 systematic review of eleven studies found that fusion significantly reduced back-pain scores and re-recurrence or instability, but made no significant difference to leg pain or functional recovery. A 2025 meta-analysis restricted to four randomised trials found a similar pattern, with reduced back pain and lower re-recurrence but no significant difference in leg pain, although the heterogeneity between trials was extreme.

The pattern across this evidence is that discectomy alone gives broadly equivalent leg-pain and functional outcomes with less surgical morbidity, while the advantage of fusion is confined to back pain and to reducing re-recurrence and instability in selected cases. International recommendations describe fusion as a selective rather than a routine addition, reserved for situations such as demonstrable segmental instability or deformity, a second or further recurrence, predominantly axial back pain, collapse of the disc height or foramen, or an associated spondylolisthesis. With only around four randomised trials and severe heterogeneity, longer-term superiority, including the question of adjacent-segment degeneration, remains unproven.

Endoscopic and minimally invasive revision

Full-endoscopic revision has been compared with microsurgical revision in a randomised study by Ruetten and colleagues, which found equal clinical results and similar recurrence rates, with the endoscopic approach offering less tissue trauma, faster rehabilitation and fewer complications. Broader, mostly retrospective evidence reports comparable leg and back pain, function and recurrence with shorter stays and less blood loss. The main limitations are a steep learning curve, with higher dural-tear and recurrence rates described during the learning phase, and the fact that most data outside the Ruetten trial are single-centre.

Annular closure devices

An annular closure device is a small implant placed at the time of the original microdiscectomy to bridge a large defect in the annulus and reduce the chance of material herniating again. In a pivotal multicentre randomised trial, 554 patients with large annular defects of six to ten millimetres were allocated to a device or to microdiscectomy

alone. At two years, symptomatic reherniation was around twelve per cent with the device against twenty-five per cent without it, and reoperation for recurrent herniation was around five per cent against thirteen per cent, roughly halving both. Five-year follow-up reported that these reductions were sustained.

Several caveats accompany these results. Disability and pain scores were comparable between the groups, so the benefit lay in preventing recurrence rather than in improving pain or function beyond that. Endplate changes were more frequent with the device, a signal of bone resorption, and the trial was industry-funded. The device addresses prevention at the time of the first operation in high-risk defects rather than the treatment of an established recurrence.

Outcomes and outlook

Large prospective registries show that both primary and revision groups improve. In the Swedish Spine Register, differences favouring primary surgery in leg pain, disability and quality of life were statistically significant but likely below the threshold of what patients perceive as a meaningful change, meaning revision outcomes are modestly rather than dramatically worse. A subanalysis of the SPORT trial found that the reherniation group improved less on most measures but that outcomes partly converged over four years. Patient satisfaction is consistently reported as lower after revision, in one large analysis around fifty-eight per cent against seventy-nine per cent for primary surgery. The overall picture is of good improvement after revision surgery that is less predictable, with lower satisfaction and higher complication rates than primary surgery, while minimally invasive and endoscopic series sometimes approach primary-surgery outcomes.

On prevention, the modifiable factors most consistently discussed are smoking, which is among the most reliable predictors of recurrence and reoperation, weight, glycaemic control in diabetes and the avoidance of early heavy spinal loading. In the United Kingdom, NICE guidance on low back pain and sciatica is explicit that a person's body mass index, smoking status or psychological distress must not be used to gate referral for a surgical opinion, even though these factors are associated with recurrence. The same guidance frames epidural injection and decompressive surgery around the persistence of symptoms and their correlation with imaging, and does not support routine fusion for low back pain outside a trial setting.

Common questions

What is a recurrent lumbar disc herniation?

It is a fresh herniation of disc material at the same level of the spine that was previously operated on, occurring after a genuine pain-free interval, usually defined as at least six months, since an earlier discectomy or microdiscectomy. Some definitions narrow this to the same level and the same side, confirmed on MRI.

How is it different from scar tissue?

Scar tissue, or peridural fibrosis, is fibrous tissue that forms naturally around the nerve root after any spinal operation. It is not the same as a new disc herniation, though the two can cause overlapping symptoms. On contrast-enhanced MRI scar tissue takes up the contrast and enhances, whereas a recurrent disc generally does not enhance early, which is the principle used to tell them apart.

How is it different from a residual or persistent herniation?

A residual or persistent herniation refers to disc material left behind at the first operation, or to symptoms that never fully settled. The discriminating feature is the pain-free interval: a true recurrence follows a period free of symptoms, whereas residual disease tends to cause pain that continues or returns within the first weeks or months.

How common is recurrence after a discectomy?

A commonly quoted headline for symptomatic recurrence after primary microdiscectomy is around five to fifteen per cent, with the wider published range running from roughly two to twenty-five per cent. The figure depends on what is being measured.

Why do different sources give such different recurrence rates?

Because they count different things. Radiographic recurrence, meaning herniation seen on a scan regardless of symptoms, is much higher, reported at around twenty-seven per cent in one large series. Symptomatic recurrence is lower, and reoperation lower again, at around nine to ten per cent at a few years. Different definitions of the pain-free interval add further variation.

Why does recurrence sometimes happen after a pain-free gap?

The pain-free interval is part of the definition of a true recurrence. After successful surgery the nerve settles and symptoms resolve, but the disc remains degenerate and the outer ring may carry a defect, so a fresh fragment can herniate at the same level months or years later, often producing leg pain similar to the original.

What raises the risk of recurrence?

The strongest single factor reported is a large tear in the outer ring of the disc, of six millimetres or more. Smoking, changes in the bony endplates known as Modic changes, and a preserved disc height are also among the more consistent factors. Diabetes, higher body mass index and age are reported less consistently and sometimes conflict between studies.

Is a large annular tear really the most important factor?

It is the strongest mechanical factor described in the literature. Symptomatic reherniation has been reported at around twenty-seven per cent where the defect is six millimetres or more, against roughly one per cent where the remaining outer ring is small and intact.

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