

Discitis

A patient guide

In brief: Discitis is an infection of an intervertebral disc, the soft cushion that sits between two of the bones, or vertebrae, that make up the spine. In adults it very rarely occurs in isolation. The infection usually begins in the bone of the vertebra immediately next to the disc and then spreads into the disc itself, so that discitis is best understood as one part of a broader condition that doctors call spondylodiscitis, or vertebral osteomyelitis. These overlapping terms describe infection of the disc and the neighbouring vertebral bone, and they sit on a spectrum that also includes collections of pus around the spine. The commonest cause is a bacterium, most often *Staphylococcus aureus*, which usually reaches the spine through the bloodstream from an infection elsewhere in the body, and sometimes enters directly after a spinal procedure. It is an uncommon but serious infection. The central messages are that it is recognised chiefly by persistent back pain together with raised markers of inflammation in the blood, that magnetic resonance imaging is the key investigation, that identifying the responsible organism through blood cultures or a biopsy guides treatment, and that the great majority of cases are managed successfully with targeted antibiotics, with surgery reserved for specific situations such as instability, a significant abscess or pressure on the nerves. It is a condition diagnosed and managed by a specialist multidisciplinary team.

What discitis is, and why it rarely stands alone

The spine is a column of bones, the vertebrae, separated by intervertebral discs. Each disc is a tough, slightly cushioning structure with a firm outer ring and a softer centre, and it allows the spine to bend and absorb load. Discitis means infection of one of these discs.

In children and adults the picture differs in an important way that explains much of the rest of the subject. In adults the disc has very little of its own blood supply; it is largely avascular. Because bacteria travel in the blood, they do not usually settle in the disc first. Instead, the infection typically begins in the bone of the vertebral body, at the endplate where it meets the disc, in a region that is rich in small end-arteries. From there the infection spreads into the adjacent disc and then often into the vertebra on the other side. For this reason, what starts as bone infection, vertebral osteomyelitis, and what is termed discitis are in adults usually two views of the same process at different stages.

This is why specialists increasingly prefer the terms spondylodiscitis or vertebral osteomyelitis, and why the word discitis on its own is regarded as something of a simplification in adult practice. Truly isolated infection confined to the disc is unusual in adults. The disc, the endplates and the vertebral bodies are involved together, and the condition is best pictured as a single infection spanning the disc and the bone either side of it.

The spondylodiscitis spectrum: disc, bone and the space around the spine

It helps to see discitis as one point on a connected spectrum of spinal infection. At one end is infection largely centred on the disc space. Alongside and overlapping with it is vertebral osteomyelitis, infection of the vertebral bone. When both are involved together, the umbrella term spondylodiscitis is used, and this is the most common form that spinal infection takes.

The spectrum extends further. Infection can track outwards from the disc and bone to form a collection of pus in the soft tissues beside the spine, a paravertebral or psoas abscess. It can also collect within the spinal canal itself, in the space around the protective covering of the spinal cord and nerves, forming a spinal epidural abscess. This last form is particularly important because a collection in that confined space can press on the nerves or the spinal cord.

Understanding this spectrum matters because it shapes how the condition is assessed and managed. A small, early infection confined to the disc and endplates is a different proposition from an extensive infection that has destabilised the bone, collapsed the disc space or formed an abscess pressing on the nerves. The same underlying disease can therefore present in mild or in serious forms, and part of the specialist assessment is to establish where on this spectrum a given case sits.

Discitis in children compared with adults

Discitis behaves differently in children, and the contrast is instructive. In young children the disc retains some of its own blood supply, so bacteria can be carried directly into the disc by the vascular route. Childhood discitis is therefore more genuinely an infection of the disc itself, rather than a secondary spread from infected bone as it usually is in adults.

The presentation in children is often vague and non-specific. A young child may simply refuse to walk, sit or stand, may limp, may hold the back stiffly, or may be irritable, and back pain may not be clearly expressed. Many affected children are not particularly unwell in themselves and may have no fever, which can make the diagnosis elusive. Symptoms relating to the abdomen are also described. There is sometimes a history of a minor preceding illness or injury.

The course also tends to differ. Childhood discitis is generally regarded as a milder condition than the adult form, and in many children it settles with rest and antibiotics, with the disc space tending to be preserved or to recover. In adults the condition is more challenging, the bone is more involved, and the disc space more often goes on to fuse as it heals. This page concentrates chiefly on the adult condition, while noting that the paediatric form is a recognised and generally more benign entity.

How common it is, and who tends to be affected

Spondylodiscitis is uncommon but is being seen more often. Reported incidence figures vary by country and era, ranging broadly from a fraction of a case to several cases per hundred thousand people each year, and several national studies have documented a clear rise over recent decades. This increase is attributed to an ageing population, a greater burden of chronic illness, more spinal procedures, and improved imaging that detects the condition more reliably.

The condition is more frequent in older adults, and a substantial proportion of cases occur in people over sixty, with the incidence rising further in the oldest age groups. By region of the spine, the lower back, the lumbar spine, is the most commonly affected, followed by the thoracic spine in the mid-back, with the neck, the cervical spine, involved least often. These are population-level patterns; the condition can occur at any level and at a wide range of ages.

Why it happens: how infection reaches the disc

Infection reaches the spine by a small number of recognised routes, and understanding them explains both the risk factors and the way the condition is investigated.

****Spread through the bloodstream**** is the commonest route. This is termed haematogenous spread. Bacteria entering the bloodstream from an infection elsewhere, perhaps of the skin, the urinary tract, the chest, the mouth, the heart valves or the gut, are carried to the spine and lodge in the small end-arteries of the vertebral bone near the disc. There they establish infection that then extends into the disc. Because the bloodstream is the conduit, a source of infection in another part of the body, or a bloodstream infection such as may accompany infective heart-valve disease, can lie behind a case of spondylodiscitis.

****Direct entry after a procedure**** is the second route. Any procedure that breaches the disc or the tissues around it can introduce bacteria. This includes operations such as discectomy, as well as less invasive interventions such as injections into or near the disc, discography and similar procedures. Infection following spinal surgery on a disc

is uncommon, reported in a small percentage of cases, and infection after injections is rarer still, but these post-procedural cases are a recognised and distinct group.

****Spread from neighbouring tissue**** is the third and least common route, in which infection in tissue directly adjacent to the spine extends into the bone and disc.

Risk factors

Certain circumstances make spondylodiscitis more likely, largely because they either increase the chance of bacteria entering the bloodstream or reduce the body's ability to contain infection. Diabetes is among the most frequently cited associations. A weakened immune system, whether from illness or from medication that suppresses immunity, is another. Injecting drug use is a well-recognised risk, both because it introduces bacteria and because of its association with heart-valve infection.

Other recognised associations include long-term kidney disease and the need for dialysis, liver disease, cancer, and conditions or treatments that lower resistance to infection generally. Previous spinal surgery or spinal injections, as described above, provide a direct route. Older age and frailty feature prominently, in keeping with the rising incidence among the elderly. Infective endocarditis, an infection of the heart valves, deserves particular mention, since spondylodiscitis can arise as a complication of it through seeding of bacteria from the heart into the bloodstream, and the two conditions are sometimes found together. These are statistical associations observed across groups of patients; many people who develop the condition have none of them, and most people with these risk factors never develop spinal infection.

How it presents

The hallmark of spondylodiscitis is back pain, and its character is often what raises suspicion. The pain tends to be persistent and unremitting, frequently present at rest and at night, and it may not ease in the way that ordinary mechanical back pain does. It builds over days to weeks rather than appearing suddenly, and it is localised to the affected level of the spine, which is often tender to pressure. Movement of the back is commonly restricted and guarded.

Fever and feeling generally unwell may be present, but they are not always so, and their absence does not exclude the condition. This is one of the features that can make spondylodiscitis difficult to recognise early, because in many people the back pain dominates and the signs of infection are subtle. The insidious tempo and the lack of dramatic systemic illness in some cases are part of why diagnosis is sometimes delayed.

When the infection extends to press on the nerves or the spinal cord, whether through an abscess in the spinal canal or through collapse and deformity of the bone, additional features can appear. These include pain radiating into a limb, weakness, numbness, or, in more serious situations, disturbance of the nerves controlling the bladder or bowel. Such neurological features are an important part of what the assessing team looks for, because they bear directly on whether and how urgently surgery may be needed.

The central role of inflammatory markers and MRI

Two strands of investigation are central to recognising spondylodiscitis: blood tests that show inflammation, and imaging that shows the infection.

****Inflammatory markers**** in the blood are raised in the great majority of cases. The two most useful are the erythrocyte sedimentation rate, the ESR, and the C-reactive protein, the CRP. These are general measures of inflammation rather than tests specific to spinal infection, but they are nearly always elevated when spondylodiscitis is present, and they are valuable both in raising suspicion and in following the response to treatment over time. A persistently raised inflammatory marker in someone with unexplained, unremitting back pain is one of the patterns that prompts further investigation. The white cell count may also be raised, though less reliably.

Magnetic resonance imaging, the MRI scan, is the key investigation and is widely regarded as the single most important test, with a sensitivity and specificity reported above ninety-five per cent. MRI shows the disc, the vertebral endplates and the bone marrow in fine detail, and it reveals the characteristic changes of infection, the inflammation of the bone marrow either side of the disc, the changes within the disc space, and any abscess in the surrounding tissues or in the spinal canal. Crucially, MRI also shows whether the spinal cord or nerves are being compressed. It can detect the condition early, before bone destruction is advanced, and it is the principal means of distinguishing infection from the many other causes of back pain. Where MRI cannot be performed, computed tomography and nuclear medicine scans provide alternatives, but MRI remains central.

Finding the organism: blood cultures and biopsy

Treatment depends on antibiotics, and the most effective antibiotic treatment is one directed at the specific organism responsible. A major aim of the work-up is therefore to identify that organism.

Blood cultures are the first and simplest step. Samples of blood are incubated to see whether bacteria grow, and when they do, the organism is identified and its antibiotic sensitivities determined. Because much spondylodiscitis arises from bloodstream spread, blood cultures are positive in a meaningful proportion of cases and can establish the diagnosis without any need for a needle in the spine.

Image-guided biopsy is used when blood cultures do not yield an organism. Under imaging guidance, usually computed tomography, a needle is passed into the affected disc and bone and a sample is taken for culture and examination. The yield from such biopsies is moderate rather than guaranteed; a single biopsy identifies the organism in roughly a third of cases, and a repeat biopsy adds further yield, so that more than one attempt is sometimes required. A positive result is valuable because it allows antibiotic treatment to be tailored precisely. Identifying the organism also matters for distinguishing ordinary bacterial infection from less common causes such as tuberculosis, brucellosis or fungal infection, which require quite different treatment.

The general principle, reflected in specialist guidance, is that confirming the organism before committing to prolonged antibiotic treatment is preferred wherever the clinical situation safely allows it, because it makes the treatment more accurate and the course more certain.

Less common causes: tuberculosis, brucellosis and fungal infection

While ordinary pyogenic bacteria, led by *Staphylococcus aureus*, account for most cases, spinal infection can also be caused by other organisms that behave differently and require different treatment.

Tuberculosis of the spine, historically known as Pott's disease, is an important and globally significant cause. It tends to run a more slow and insidious course than pyogenic infection, often with relatively few systemic symptoms, and it has a particular tendency to cause vertebral collapse and spinal deformity. It is treated with prolonged combination anti-tuberculous medication rather than ordinary antibiotics, which is one of the reasons identifying the organism matters so much.

Brucellosis, an infection acquired from animals or unpasteurised dairy products, is a recognised cause in regions where it is common, and it tends to spare the vertebral architecture relatively more than tuberculosis.

Fungal infection of the spine is uncommon and is seen chiefly in people whose immunity is significantly impaired. Each of these requires treatment quite distinct from that for ordinary bacterial spondylodiscitis, which underlines why the diagnostic effort to name the organism is so central.

How it is managed: principles of treatment

The management of spondylodiscitis follows a clear set of principles, built around antibiotics directed at the organism, support of the spine, and surgery reserved for specific indications. It is conducted by a multidisciplinary team that typically brings together spinal surgeons, infection specialists, radiologists and microbiologists.

****Targeted antibiotic treatment**** is the foundation. The great majority of cases are managed successfully without surgery, by a prolonged course of antibiotics chosen, wherever possible, to match the organism identified from blood cultures or biopsy. Treatment is usually begun intravenously and then, in suitable cases, switched to tablets once the infection is under control and where the chosen antibiotic is well absorbed by mouth. The duration is measured in weeks; specialist guidance and a randomised trial support a course of around six weeks for many uncomplicated cases, with longer courses used where the infection is more extensive, where an abscess is present, or where particular organisms or circumstances call for it. The response is monitored clinically and through the falling inflammatory markers and, where needed, repeat imaging.

****Support and immobilisation**** of the affected part of the spine play a part in managing pain and protecting the bone while it heals. Rest in the early phase, and the use of a brace in some cases, are described as helping to control pain and to limit movement at the infected segment, supporting the healing process.

****Surgery**** is reserved for specific situations rather than being routine. The recognised indications include pressure on the spinal cord or nerves causing a neurological deficit, a significant abscess that needs draining, instability or collapse of the spine threatening its structure, progressive spinal deformity, and failure of the infection to respond to appropriate antibiotic treatment. Where surgery is undertaken, its aims are to clear infected and dead tissue, to drain any abscess, to relieve pressure on the nerves, and to stabilise the spine where its structure has been compromised. The decision to operate, and its timing, weigh the severity of these problems against the risks of surgery, and are individualised by the treating team.

Outlook

The outlook in spondylodiscitis, while it must be taken seriously, is for most people favourable when the condition is recognised and treated appropriately. The majority of cases are cured with targeted antibiotic treatment alone, and published series report high rates of cure with modern management. Childhood discitis in particular tends to settle well.

Several factors temper this generally good picture. The condition can cause lasting effects where it has been advanced at the time of diagnosis, where the bone has collapsed and the spine deformed, or where pressure on the nerves has produced a deficit that does not fully recover. Older and frailer patients, and infections caused by certain organisms or accompanied by an abscess or a bloodstream infection, are recognised as carrying a higher risk of a difficult course. Delay in diagnosis, which the insidious presentation can encourage, is one of the factors that can worsen outcome, which is why a high index of suspicion in the right setting matters.

Across the whole subject, the consistent themes are that spondylodiscitis is an uncommon but serious infection that usually begins in the bone and spreads to the disc, that it is recognised through persistent back pain and raised inflammatory markers and confirmed chiefly by MRI, that naming the organism through blood cultures or biopsy makes treatment precise, that targeted antibiotics cure most cases with surgery reserved for instability, abscess or nerve compression, and that it is a condition best assessed and managed by a specialist multidisciplinary team. Any individual outlook is a matter for that team rather than something that can be read from a category alone.