CONDITION

Arachnoiditis

Learn how arachnoiditis affects spinal nerves, including possible symptoms, causes, diagnosis, treatment, complications, and when to seek urgent care.

WHAT IT IS
Inflammation and scarring of the arachnoid

BODY SYSTEM
Nervous system

MAIN SYMPTOMS
Nerve pain, numbness, weakness, bladder or bowel difficulties

WHAT CAUSES IT
Spinal irritation or inflammation, often unknown

HOW IT IS DIAGNOSED
MRI, sometimes CT myelography

MAIN TREATMENT
Symptom control and rehabilitation

CAN IT BE CURED?
No, treatments do not remove scarring

IS IT AN EMERGENCY?
Sometimes, new bladder or bowel control loss

LONG-TERM OUTLOOK
Symptoms may remain stable or change over time

Overview

Arachnoiditis is inflammation and scarring of the arachnoid, one of the thin membranes that surround the brain, spinal cord, and spinal nerve roots. The condition most often affects the lower spine. When inflammation becomes long-lasting, scar tissue may cause nearby nerve roots to stick together. This is sometimes called adhesive arachnoiditis.

The affected nerves carry signals for movement, sensation, pain, and bladder or bowel function. Scarring around these nerves can interfere with those signals and with the normal movement of cerebrospinal fluid, the clear fluid surrounding the brain and spinal cord.

Arachnoiditis can cause chronic nerve pain, numbness, weakness, and other neurologic symptoms. The pattern varies widely. Some people have stable symptoms, while others experience changes over time. Imaging findings also do not always match the intensity of a

person's symptoms.

There is no single test that proves every case and no treatment that reliably removes established scarring. Care usually focuses on reducing symptoms, preserving mobility, improving daily function, and addressing complications. Because several more common conditions can cause similar symptoms, a careful evaluation is important before attributing symptoms to arachnoiditis.

Symptoms

Symptoms depend on which nerve roots are involved and how much their function has been affected. They may begin soon after an injury, infection, or spinal procedure, but they can also appear months or years later. Symptoms may remain steady, fluctuate, or gradually change.

Pain is common. It may be described as burning, electric, stabbing, or deep aching pain in the lower back, buttocks, legs, or feet. Pain caused by irritated or damaged nerves is known as neuropathic pain. Some people feel as if water is running down a leg or insects are crawling on the skin even though nothing is present.

Changes in sensation may include tingling, pins and needles, numbness, unusual sensitivity to touch, or reduced awareness of temperature. Muscle cramps, spasms, twitching, stiffness, or weakness can occur. Walking may become difficult if pain, weakness, poor balance, or reduced sensation affects the legs.

If lower spinal nerve roots are involved, symptoms can affect pelvic organs. These may include difficulty starting urination, incomplete bladder emptying, urinary leakage, constipation, loss of bowel control, or changes in sexual function. These symptoms have many possible causes and require medical assessment rather than being assumed to result from arachnoiditis.

Symptoms that may occur include:

Seek emergency care for new loss of bladder or bowel control, inability to urinate, numbness around the inner thighs or genitals, or rapidly worsening leg weakness. These can be signs of severe nerve compression or another emergency. Fever with severe back pain, especially after a recent procedure or during an infection, also requires urgent assessment.

- Persistent back, buttock, leg, or foot pain
- Burning, tingling, numbness, or electric-shock sensations
- Muscle cramps, spasms, stiffness, or weakness
- Changes in balance or walking

- Bladder, bowel, or sexual difficulties

Causes and risk factors

Arachnoiditis develops after irritation or inflammation within the space around the spinal cord and nerve roots. In many people, it is difficult to identify one definite cause. A history of a spinal procedure does not by itself establish that the procedure caused later symptoms.

Possible causes include previous spinal surgery, particularly repeated or complicated procedures; bleeding around the spinal cord; direct spinal injury; and infections involving the spinal membranes. Tuberculosis, fungal infections, and bacterial meningitis are among the infections that can lead to inflammation and scarring, although the likelihood depends on a person's health and exposures.

Certain substances placed into the spinal canal have also been associated with arachnoiditis. Older oil-based contrast agents once used for myelography, an imaging test of the spinal canal, are a well-recognized historical cause. These agents are no longer used in modern practice. Irritation following medication delivery or other injections near spinal structures has been reported, but determining cause and effect in an individual case may be difficult.

Blood within the spinal fluid, long-standing pressure on nerve roots, or complications such as infection after a procedure may increase inflammation. Some cases occur without a clear trigger.

Factors that may be relevant to an evaluation include:

- Previous spinal surgery, trauma, bleeding, or infection
- A history of meningitis or infection near the spine
- Prior procedures that entered or approached the spinal canal
- Older myelography performed with oil-based contrast
- Repeated inflammation or structural disease affecting spinal nerves

Diagnosis

Diagnosis begins with a detailed medical history and neurologic examination. A clinician may ask when symptoms began, how they have changed, and whether there was a previous infection, injury, operation, spinal injection, or myelogram. The examination may assess strength, reflexes, sensation, balance, walking, and bladder or bowel function.

Magnetic resonance imaging, or MRI, is the main imaging test. It uses a magnetic field rather than ionizing radiation to produce detailed images of the spinal canal. Contrast material may be used in some situations.

MRI findings can include nerve roots that are clumped together, roots stuck along the edge of the spinal sac, an appearance called an "empty sac," or scar tissue that divides the fluid space into separate pockets. Cysts or changes in spinal fluid flow may also be present.

Imaging must be interpreted alongside the symptoms and examination. Some people have substantial MRI changes but limited symptoms, while others have severe symptoms without equally dramatic imaging findings. A scan alone therefore may not explain every concern.

CT myelography may be considered when MRI cannot be performed or when additional detail is needed. This test uses computed tomography after contrast is introduced into the spinal fluid. Because it is invasive, clinicians weigh its possible benefit against its risks.

There is no blood test that confirms arachnoiditis. Blood tests may instead look for infection, inflammation, or another explanation. Nerve studies may help assess nerve function in selected cases, but they do not diagnose arachnoiditis by themselves.

Other conditions that can resemble arachnoiditis include a herniated disc, spinal stenosis, recurrent scar tissue after surgery, peripheral neuropathy, spinal tumors, infection, and cauda equina syndrome. Diagnosis may involve a neurologist, neurosurgeon, spine specialist, radiologist, pain specialist, or rehabilitation physician.

Treatment and management

Treatment is individualized because symptoms and imaging findings vary. Established adhesive scarring is difficult to reverse, so the main goals are to control symptoms, maintain independence, and prevent avoidable complications.

A clinician may consider non-opioid pain relievers and medicines used for nerve pain. Some medicines originally developed for seizures or depression can reduce neuropathic pain in certain people. Muscle-relaxing medicines may be considered when spasms are a major problem. Each option has possible side effects and interactions, so treatment should be selected and reviewed with a qualified clinician.

Long-term opioid therapy does not correct the underlying scarring and may have important risks. If opioids like oxycodone or morphine are considered, benefits, side effects, safety, and treatment goals should be reviewed regularly.

Physical and occupational therapy can help maintain strength, flexibility, balance, and the ability to perform daily activities. Therapy may also identify appropriate walking aids or

changes to the home or workplace. Exercise plans often need to be paced so activity increases gradually without repeated severe symptom flares.

Pain can affect sleep, mood, relationships, and concentration. Psychological treatments such as cognitive behavioral therapy do not mean that pain is imaginary. They can provide practical ways to manage stress, sleep disruption, fear of movement, and the effect of pain on daily life.

Procedures require careful consideration. Spinal cord stimulation or other forms of neuromodulation may be offered to selected people with persistent pain after a specialist assessment. These treatments alter pain signaling but do not remove arachnoid scarring.

Surgery may be necessary in specific situations, such as a cyst or scar-related blockage that is causing progressive neurologic problems. Operations may release scar tissue, restore spinal fluid flow, or treat a related structural problem. However, surgery can create additional scarring, and improvement may not last. A neurosurgeon can explain whether a proposed operation has a clear target and what outcomes are realistic.

A practical management plan may combine:

- Medication monitoring for pain or muscle symptoms
- Physical and occupational rehabilitation
- Sleep and mental health support
- Mobility aids or workplace adjustments when needed
- Specialist procedures only after a careful review of benefits and risks

Complications

Arachnoiditis can lead to persistent pain and reduced mobility. Weakness, poor balance, or numbness may raise the risk of falls. Reduced sensation can also make pressure injuries, burns, or foot wounds harder to notice.

Long-standing nerve dysfunction may affect bladder emptying or bowel control. Incomplete bladder emptying can contribute to urinary problems, while reduced mobility and some medicines may worsen constipation. These concerns can often be managed more effectively when discussed early.

Scarring may interfere with normal spinal fluid flow. In some cases, this contributes to fluid-filled cavities within the spinal cord, called syringomyelia, or to arachnoid cysts. These complications may require specialist imaging and monitoring.

Chronic pain can disrupt sleep, employment, relationships, and emotional health. Depression or

anxiety may occur alongside persistent pain and deserve direct treatment. Seek immediate help for thoughts of self-harm or suicide.

Follow up

Routine follow-up may involve primary care, pain medicine, neurology, rehabilitation, or spine specialists. The frequency depends on symptom stability, functional needs, and current treatments.

At follow-up visits, discuss changes in pain, strength, sensation, walking, sleep, bladder or bowel function, and ability to complete daily tasks. Medication benefits and side effects should be reviewed. Rehabilitation goals may need adjustment as abilities or circumstances change.

Repeat imaging is not always needed for stable symptoms. It may be considered if there is new or progressive weakness, a major change in sensation, new bladder or bowel symptoms, or concern for another spinal condition.

Contact a clinician promptly for worsening pain accompanied by new weakness, increasing falls, new urinary difficulty, or a significant change in walking. These concerns may need assessment soon but are not always emergencies.

Go to an emergency department for:

- New loss of bladder or bowel control
- Inability to urinate
- New numbness around the genitals, buttocks, or inner thighs
- Rapidly worsening weakness or inability to walk
- Severe back pain with fever, confusion, or recent serious infection

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