

Myelography

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What is Myelography?

Myelography is an x-ray examination of the spinal cord and the space surrounding it, called the subarachnoid space. The x-ray film, or myelogram, is taken after injecting a radiopaque contrast material through a needle placed in this space. Myelography can demonstrate distortions of the spinal cord, the spinal canal within which it lies, and the spinal nerve roots connected to it. It is an effective means of identifying spinal lesions caused by disease or trauma. This exam, done about 350,000 times a year in the United States, is relatively safe and painless.

A myelogram is done to provide a very detailed picture of the spinal cord and

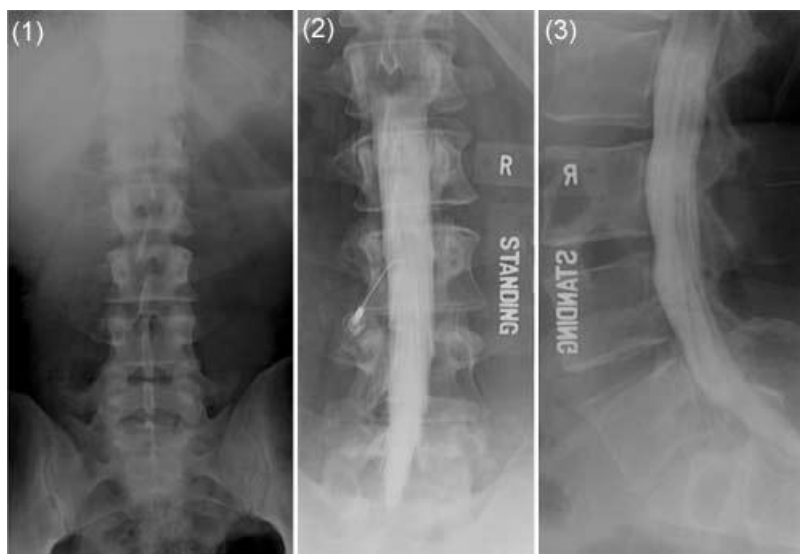


Chest X-ray equipment.

spinal column, and of any abnormalities that may be present. Often myelography is performed when other tests—such as computed tomography (CT) scans or magnetic resonance imaging (MRI) have not provided adequate information. For patients who cannot have an MRI exam for any reason, myelography may be performed, followed by a CT scan.

What are some common uses of Myelography?

- Myelography can identify a herniated or ruptured intervertebral disk. Slipped disk is a common term for this problem. The disks are pads of rubbery tissue that lie between the vertebrae, the bones that make up the spine. Disks act to cushion the vertebrae when the backbone comes under pressure, whether from heavy lifting, sudden strain, change in position, or injury. There may be sudden severe back pain if the disk ruptures, or pain may develop gradually with advancing age as the disks degenerate. The lower part of the back is most often affected. A myelogram can accurately locate the disk or disks involved, and show whether disk tissue is pressing on nerves connected to the spinal cord. This information is especially important when surgical treatment is a possibility.
- People with spinal arthritis sometimes develop sharp outgrowths of vertebral bone called bone spurs; these may press on spinal nerves and cause pain. Here again, a myelogram can indicate whether surgery might help. The exam also can identify a condition called spinal stenosis where the entire spinal canal is narrowed.
- Tumors may develop within the spinal cord or surrounding tissues. In addition, cancer from elsewhere in the body may spread to the spine. A myelogram will accurately locate a tumor mass in this region and may suggest the most effective treatment.
- Other conditions that may be shown by a myelogram include infection, inflammation of the arachnoid membrane that covers the spinal cord, abnormalities of blood vessels that supply the spinal cord, and traumatic injuries.



Preliminary view (1) of lumbar spine. Front (2) and side (3) views during a myelogram with iodine in the spinal canal.

How should I prepare for my Myelography procedure?

Usually patients are advised to increase their fluid intake the day before a scheduled myelogram, as it is important to be well hydrated. Solid foods are avoided for several hours before the exam, but fluids may be continued. You should provide the radiologist or technologist with a list of drugs you are taking. Some drugs should be stopped one or two days before myelography. They include certain antipsychotic medications, antidepressants, blood thinners, and drugs—especially metformin—that are used to treat diabetes. It is important that medical staff know if you have had seizures, or that you are—or might be—pregnant. If you smoke, stopping the day before the test will lessen the chance of your becoming nauseous or having headache after myelography. You will be asked to empty your bladder and bowel, using a laxative if needed, just before the exam begins so as not to have to interrupt it.

If you have had a severe allergic reaction to medication or anything else, or have a history of asthma, you will be watched especially carefully to check for a reaction when injecting the contrast material. Allergy to iodine-containing substances can be especially risky. If you have had kidney problems, tests will be done to make sure that your kidneys are functioning properly at the time of myelography.

You will need to remove any jewelry near the area of your body being examined. After disrobing, you will be given a hospital gown to wear. Unless you are to spend the night in hospital, you should arrange to have a relative or friend take you home.

How does Myelography work?

Within the spinal canal, the spinal cord and nerve roots are surrounded by a fluid-filled area, the subarachnoid space. This fluid, called cerebrospinal fluid, is confined by the arachnoid membrane and serves to cushion and protect the spinal cord. For myelography, contrast material is injected into the subarachnoid space and x-rays are taken as the contrast flows into different areas. The contrast material outlines areas of the spine that usually are not visible on plain x-rays. The table that is used for myelography can be tilted so that contrast material will run up and down the spine and surround the nerve roots that enter and exit the spinal cord.

How is Myelography performed?

Myelography may be done in either a hospital x-ray department or an outpatient radiology unit. After lying face-down on the x-ray table,

fluoroscopy is performed and images of the spine are projected onto the screen of a monitor. After locating the best placement for the needle, your skin will be cleaned and numbed with a local anesthetic. Usually you will be positioned lying on one side with your knees drawn up and chin tucked into your chest while the spinal needle is inserted. In some cases, patients will be in a sitting position.

If needed, a small amount of cerebrospinal fluid will be withdrawn for lab studies. Iodine-containing contrast material then is injected and the x-ray table is slowly tilted. During this time, the flow of contrast is monitored by fluoroscopy. x-rays then are taken while you are lying face-down. You will be asked to lay as still as possible while the table is tilted at different angles. The exam focuses on the area where you are feeling symptoms: the lower back area, the middle part of the back, or the neck. A foot rest and straps or supports will keep you from sliding out of position. A computed tomography (CT) scan sometimes is done immediately after myelography while contrast material is still present in the spinal canal. This combination of imaging studies is known as CT myelography.

What will I experience during my Myelography?

You will feel a brief sting when local anesthetic is injected, and slight pressure as the spinal needle is inserted. Positioning the needle may cause occasional sharp pain. Although you may find the face-down position uncomfortable or have trouble breathing deeply or swallowing, the position is not usually maintained for very long. When contrast material is injected you may feel some pressure or warmth. Headache, flushing, or nausea may follow contrast injection. Seizures are possible, but are rare.

Myelography itself usually takes 30 to 60 minutes, and a CT scan adds another 30-60 minutes to the total examination time. Some facilities have patients stay in a recovery area for as long as four hours, resting with the head elevated at a 30° to 45° angle. You will be encouraged to take fluids at this time to help eliminate contrast material from your body and prevent headache. You probably will be asked not to engage in strenuous physical activity or bend over for one or two days. This will ensure that what contrast material remains will not get to the level of the brain. You should notify your health professional if you experience fever higher than 100.4°F, excessive nausea or vomiting, severe headache for more than 24 hours, neck stiffness, or numbness in your legs. You should also report if you have trouble urinating or passing stool.

What are the benefits vs. risks of Myelography?

Benefits

- Myelography using contrast material is an accurate way of examining the status of the spinal cord, nerve roots, and intervertebral disks. Spinal arthritis, tumors, and injuries can be shown precisely.
- A myelogram can show whether surgical treatment is promising in a given case and, if it is, can help in planning surgery.
- Myelography may be combined with computed tomography (CT) scanning or magnetic resonance imaging (MRI) to obtain a very detailed and precise idea of what changes have taken place in the spinal region.
- In some cases, myelography will show the cause of pain and other spinal symptoms even when a CT scan or MRI is negative.

Risks

- Women should always inform their doctor or radiologic technologist if there is any possibility that they are pregnant. See the Safety page for more information about pregnancy and x-rays.
- Headache commonly follows myelography but may not begin for several days after the exam. Rest and increased fluid intake readily relieve mild headache, but more severe headache may call for medication. In rare circumstances some patients continue to experience spinal headaches, which may necessitate a special procedure to stop leakage of cerebrospinal fluid from the puncture site.
- There is a small chance that you will have a reaction to contrast material. Probably only five percent to 10 percent of patients are affected and most reactions are mild, consisting of itching, rash, sneezing, nausea or anxiety. Wheezing or hives may be treated with medication. Severe allergic reactions affecting the heart or lungs are very infrequent but require emergency care.
- Rare complications of myelography include nerve injury from the spinal needle and bleeding around the nerve roots as they enter or exit the spinal cord. In addition, the membrane covering the spinal cord may become inflamed or infected. Seizures are a very uncommon complication of myelography. Kidney failure is a risk for patients who are dehydrated or who have poor kidney function.
- There is a very small risk that contrast material will block the spinal canal, probably making surgery necessary.

What are the limitations of Myelography?

- Myelography usually is avoided during pregnancy because of the risk that x-ray will harm the developing fetus.
- The findings may not be accurate if the patient moves during the exam.
- It may be difficult to inject contrast material in patients having structural defects of the spine or some forms of spinal injury.
- Myelography cannot be done if the injection site is infected.