A Patient's Guide to Medial Branch Nerve Transection

Arthrex®

Welcome to A Patient's Guide to Medial Branch Nerve Transection. Our goal is to provide you with outstanding health care elevated by an informed and positive experience.

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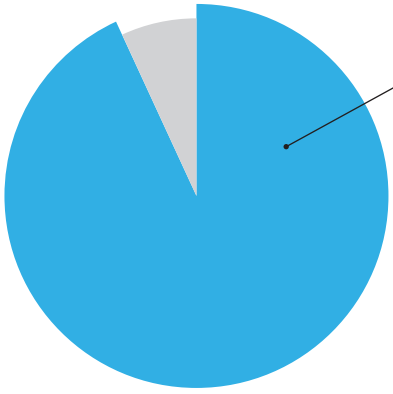
Overview

If you have acute nerve pain localized in a region, or regions, of your back, you are not alone. Often due to wear and tear of the joints within the lumbar spine, pain associated with facet joint arthropathy (arthritis) can be a common reason people seek medical treatment. For patients with degenerative joint disease, an endoscopic approach to spine surgery aims to alleviate pain and restore mobility.

Medial branch nerve transection (MBT) works to eliminate the source of this pain and dysfunction by severing a nerve that emits pain signals in patients with degenerative joints in the lower spine.

Following endoscopic lumbar spine surgery, 83.7% of patients were shown to have significantly improved function and were able to return to work in 10 days or fewer.[1]

Lower back pain can be debilitating. With modern advancements in less-invasive surgical techniques, surgeons worldwide are helping people return to their everyday activities and live the active, healthy lifestyles they love. In fact, patients who undergo endoscopic lumbar spine surgery may be able to return to sports and activities such as golf, soccer, tennis, pickleball, yoga, and other recreational activities in just 6 to 8 weeks.[2,3]



More than **85%**

of patients who undergo endoscopic lumbar spine procedures return to athletics.[2,3]

- Golf
- Soccer
- Tennis
- Fitness Training
- Recreational Activities

Understanding Your Spine

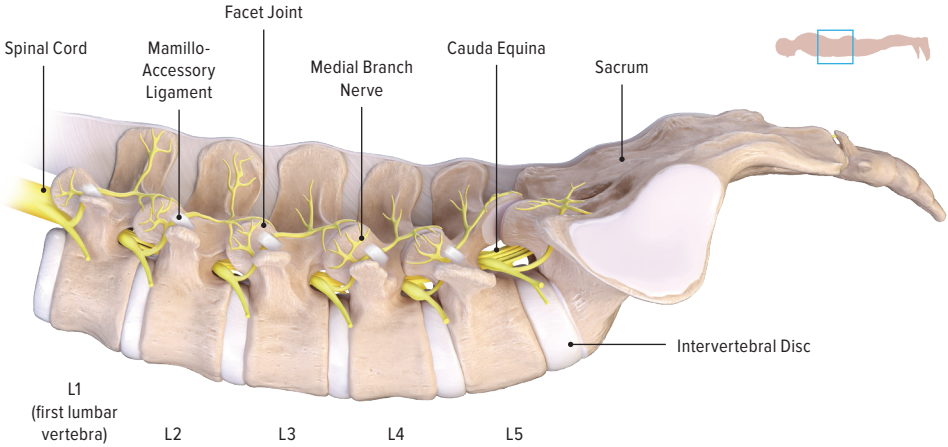
The spine is one of the most complex structures in the human body. It consists of bony and soft-tissue structures including bone, ligaments, tendons, intervertebral discs, muscles, and nerves. When functioning properly, the spine allows multiaxial movement (movement in numerous directions) while providing stability.

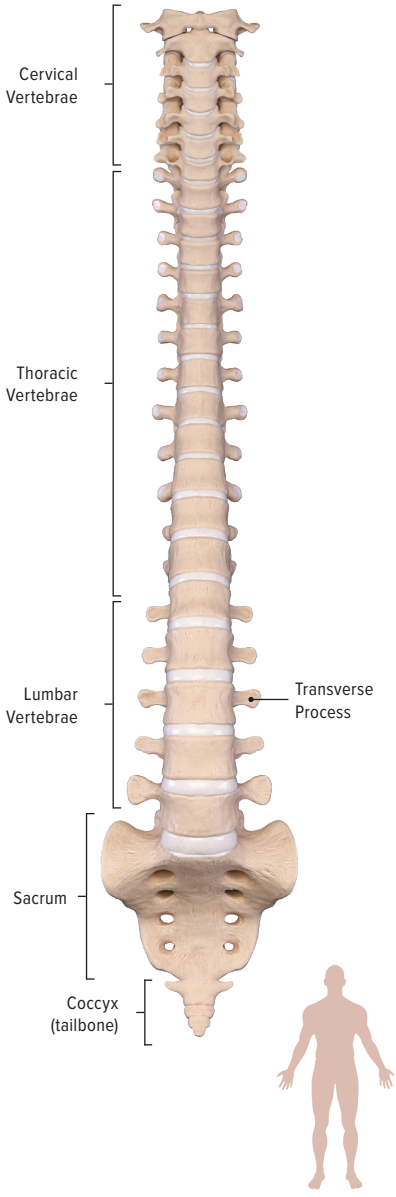
The primary bone structures to know are the vertebrae, which appear to be "stacked" on top of one another, and the associated parts that keep them together. Between each vertebrae are gel-like intervertebral discs that allow for the natural bend of the spine in all directions. Muscles, tendons, and ligaments line the spine from top to bottom.

The spine is categorized into 4 main sections:

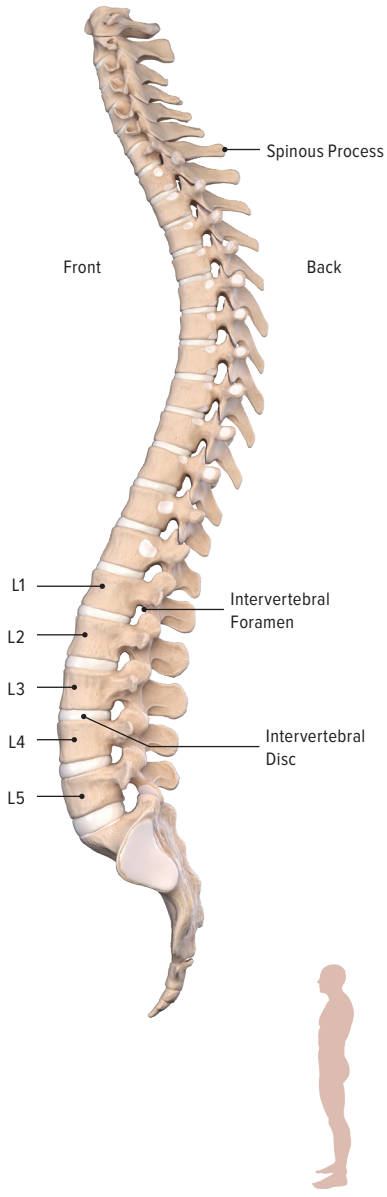
- The cervical spine, which incorporates the neck region, has 7 vertebrae
- The thoracic spine, or mid-back area, has 12 vertebrae
- The lumbar spine, or lower back, has 5 vertebrae
- The sacrum consists of 5 vertebrae that are fused together along with the coccyx, or tailbone; this combined structure is a large portion of the pelvis

Muscles, tendons, and other soft-tissue structures are present in all of these regions, with many spanning across multiple or all regions of the spine. This guide focuses on the lumbar spine and the endoscopic approaches to addressing a herniated disc.





Front view



Left-side view

Two vertebrae make up a single level of the spine, with a shock-absorbing disc in between that helps facilitate movements such as rotating and bending. Additionally, nerves serving different areas of the body extend from the spinal cord, which runs through the entire spine and allows neural activity to travel to and from the brain and the rest of the body. These nerves travel through the foramen, or opening, that exists at each level of the spine. Neural signals that travel from your body to your brain are sensory responses, while signals from your brain to your body are motor (neuromuscular) actions.

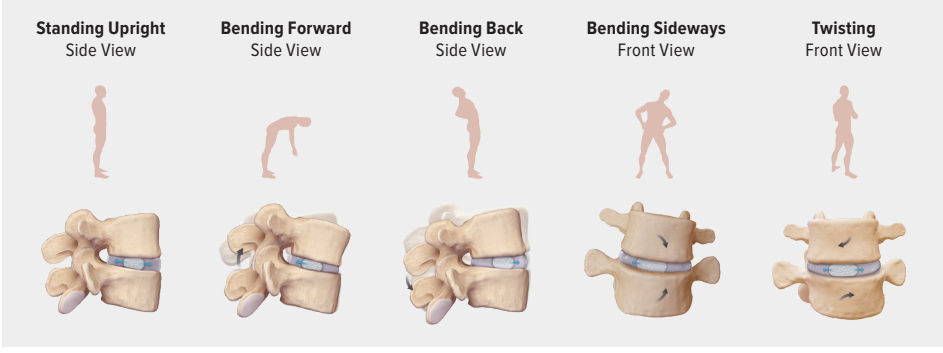
When discussing a spinal level, your doctor may use a letter and a number. For example, “L5” refers to the fifth vertebra in your lumbar spine; “L4/5” refers to the L4 and L5 vertebrae as well as the intervertebral disc between those bony structures.

Understanding Movement of the Spine

The diagram below shows various kinds of movement and the resulting actions at a single level.

Discs play a very important role in pain-free bending and rotation. Without them, the spine would not be able to complete these movements without adverse and often painful effects.

Later, the specific anatomy that makes up these discs will be reviewed in depth.



→ Movement of intervertebral disc
→ Movement of vertebra

Facet Joint Arthritis

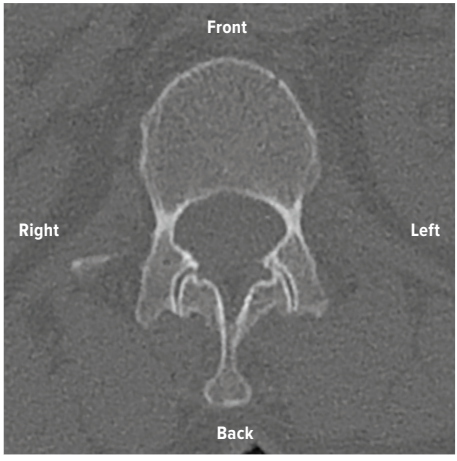
Back problems due to joint arthritis are commonly caused when the protective cartilage in and around the joints between vertebrae wears down. These areas where the vertebrae meet are called facet joints. Similar to people with arthritis present in the fingers, joint cartilage in the spine can break down, causing pain, swelling, and stiffness. The joint mechanisms found in the hands and even the toes function similarly to those found in the spine.

When functioning normally, facet joints provide stability and allow you to easily bend and rotate your back. If they begin to degrade, bone can rub against bone and cartilage will diminish. Called facet joint arthritis, or facet joint arthropathy, this condition often occurs with age but can also impact younger, more active people.

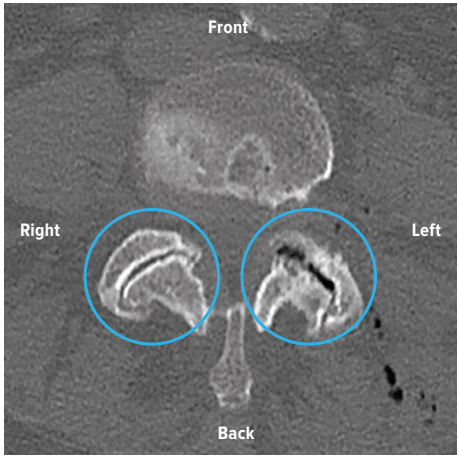
Discs work in conjunction with 2 facet joints at each level; much like a 3-legged stool, the spine cannot stand upright without all 3 intact.

Common symptoms of facet joint arthritis include:

- Localized, dull ache with radiating nerve pain that can also be felt in one or both legs
- Pain that can be felt even during periods of inactivity, such as sitting
- Muscle stiffness, weakness, and possible spasms



Normal facet



Axial facet arthritis

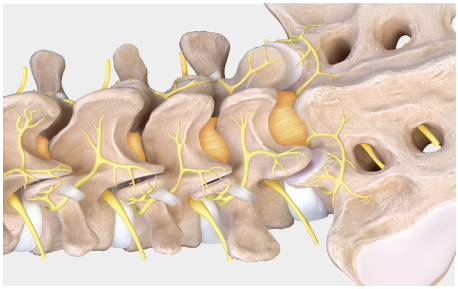
The Effects of Facet Joint Arthritis

Osteoarthritis (OA) is a condition that destroys the smooth outer covering (articular cartilage) of bone. As the cartilage wears away, it becomes frayed and rough and the protective space between the bones decreases. During movement, the bones of the joint rub against each other, sending pain signals to nearby nerves and resulting in discomfort or even severe pain.

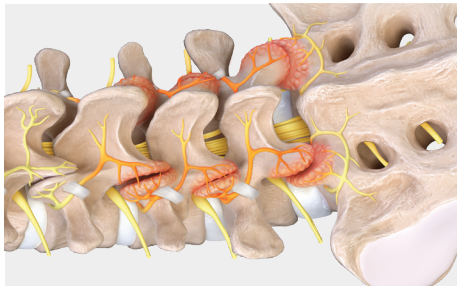
This bone grinding also commonly leads to bony growths called osteophytes, or bone spurs, forming between joints and/or around the joint area. As these spurs grow outward, they can begin to push against nearby nerves, causing further pain.

The spine acts as the information superhighway for the body, using the nerves that lie within, over, and around it to transport neural sensory signals from your body to your brain, and motor signals from your brain to your body.

The nerves associated with arthritic facet joints send sensory pain signals through this superhighway from the affected joint to the brain.



Healthy Facet Joints

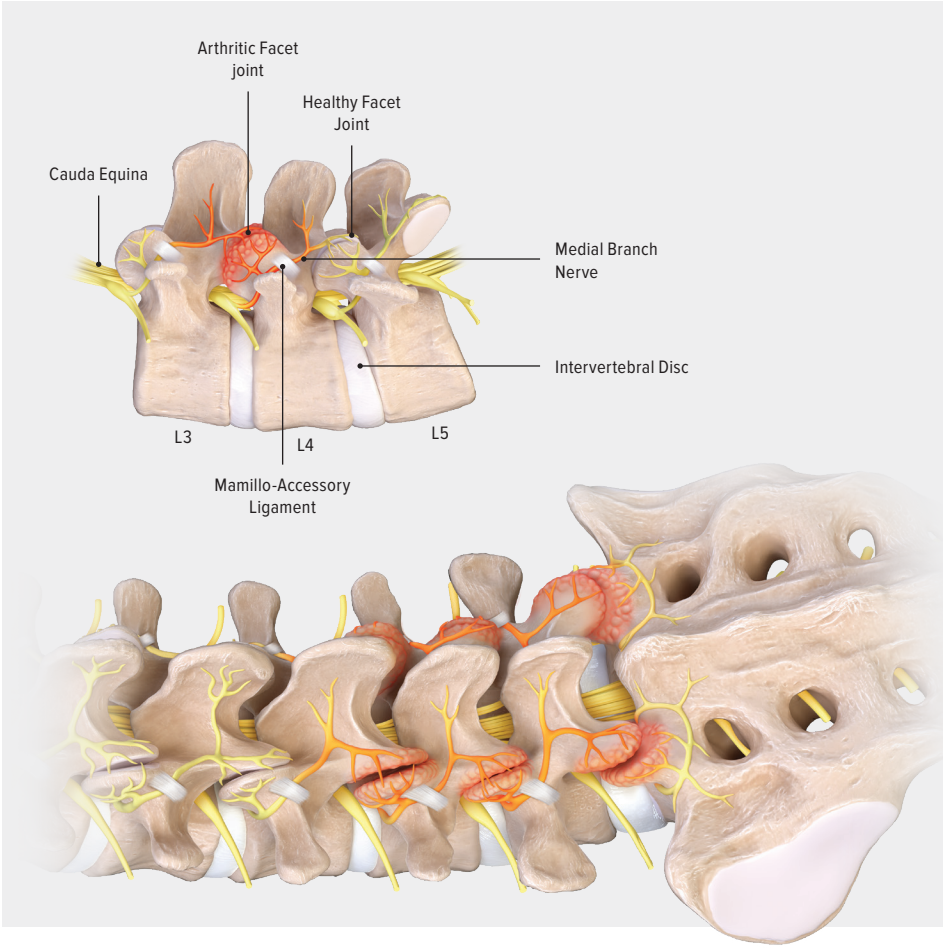


Arthritic Facet Joints

What Is the Medial Branch Nerve?

There are multiple nerves located near each level of the spine. For a patient with facet joint arthritis, buildup of bone spurs and the friction generated by bone-to-bone movement can have negative sensory reactions.

The medial branch nerve is responsible for pain from facet joint arthritis. At each level of the spine, a medial branch nerve stems from the exiting nerve root and splits into two parts, both extending toward the facet joints. Since these nerves sit close to the bone surface, osteophytes can have significant consequences, including nerve impingement (pinching) and compression.

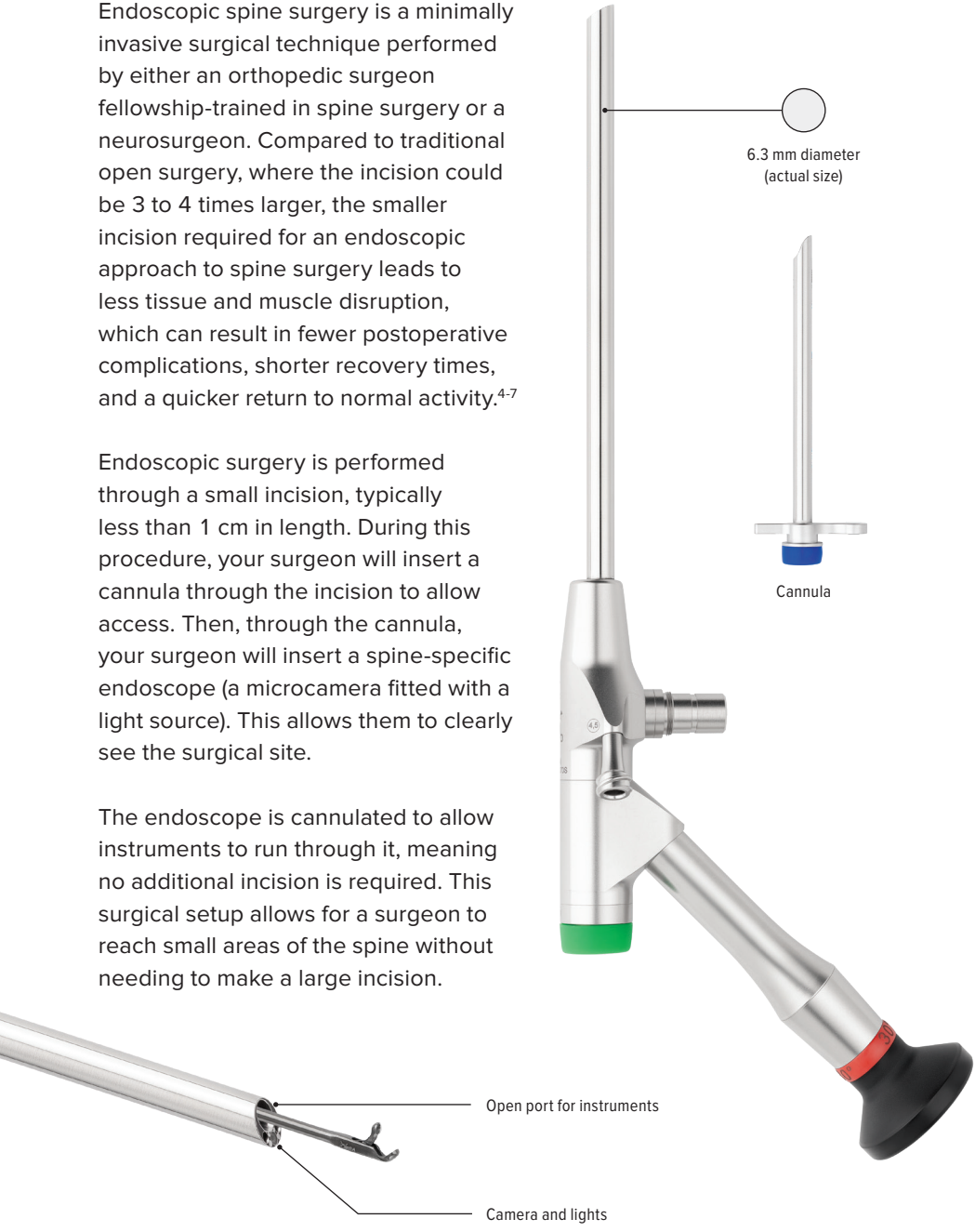


What Is an Endoscopic Approach?

Endoscopic spine surgery is a minimally invasive surgical technique performed by either an orthopedic surgeon fellowship-trained in spine surgery or a neurosurgeon. Compared to traditional open surgery, where the incision could be 3 to 4 times larger, the smaller incision required for an endoscopic approach to spine surgery leads to less tissue and muscle disruption, which can result in fewer postoperative complications, shorter recovery times, and a quicker return to normal activity.[4-7]

Endoscopic surgery is performed through a small incision, typically less than 1 cm in length. During this procedure, your surgeon will insert a cannula through the incision to allow access. Then, through the cannula, your surgeon will insert a spine-specific endoscope (a microcamera fitted with a light source). This allows them to clearly see the surgical site.

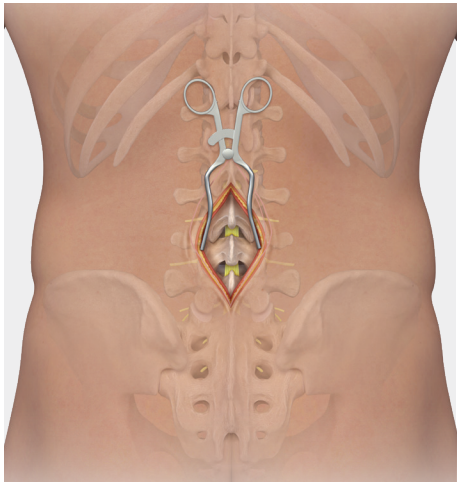
The endoscope is cannulated to allow instruments to run through it, meaning no additional incision is required. This surgical setup allows for a surgeon to reach small areas of the spine without needing to make a large incision.



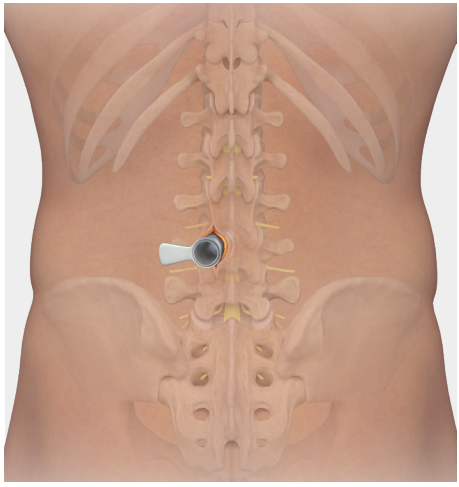
How Does Endoscopic Surgery Compare to Traditional Open Surgery?

Traditional, or open, spine surgery requires a large incision. Unlike endoscopic spine surgery, this process requires the surgeon to dissect and often damage the paraspinal muscles, which allow your body to lean side to side, arch, bend, and twist your torso. Open surgery also often requires the removal of bone to access certain regions.

Endoscopic spine surgery uses specialized instruments that allow your surgeon to view the surgical site and operate without needing to make large incisions. This minimizes disruption, or potential damage, to surrounding soft tissue such as the paraspinal muscles and reduces the need to remove bone. Instead, the surgeon makes a small opening to insert an endoscope and microsurgical tools to address many conditions that may require surgical intervention.



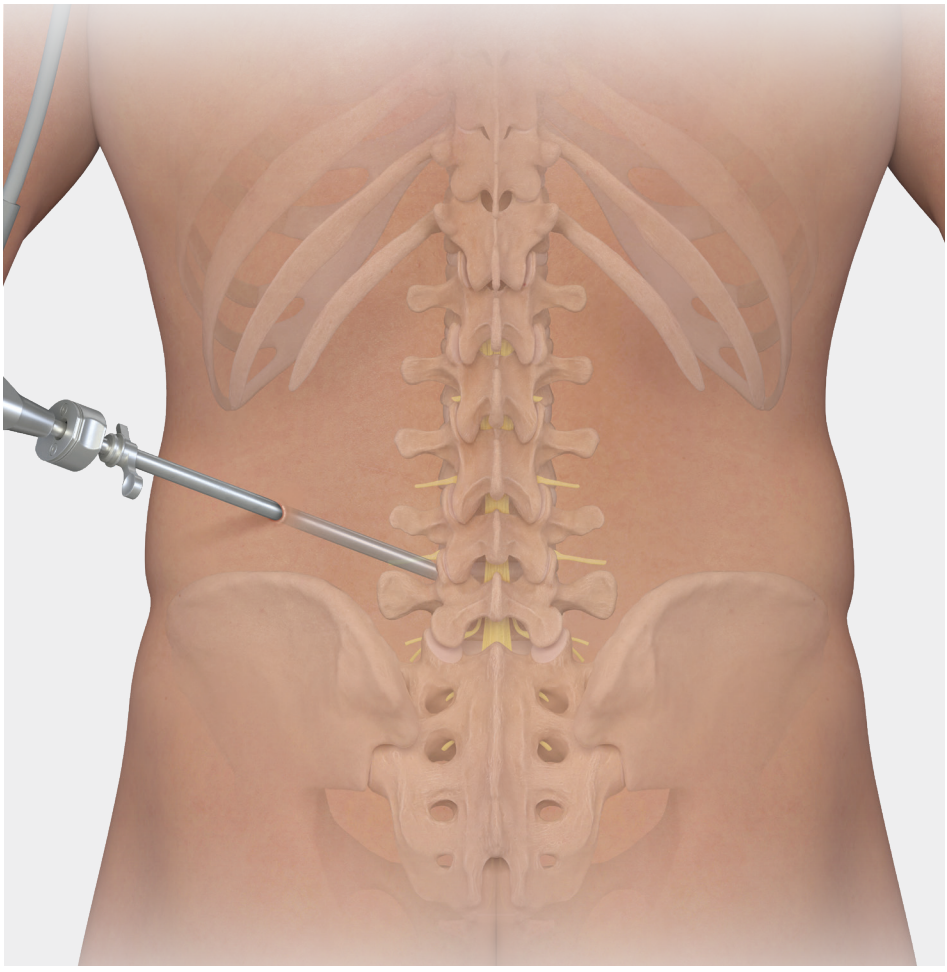
Open Lumbar Spine Procedure



Minimally Invasive Spine Procedure (typically requires a 1-in incision)

Studied benefits of endoscopic approaches to spine surgery include:

- Fewer postoperative complications[4]
- Reduced infection risk[5]
- Faster recovery, including a quicker return to normal activitiy[5]
- May be performed in an outpatient setting, potentially allowing patients to go home the same day[6]
- Reduced damage to surrounding tissues and muscles, which may result in less postoperative pain[6,7]
- Endoscope allows surgeons to visualize the affected area in real time and provide more precise surgical intervention[6]



Endoscopic Approach (typically requires a 1-cm incision)

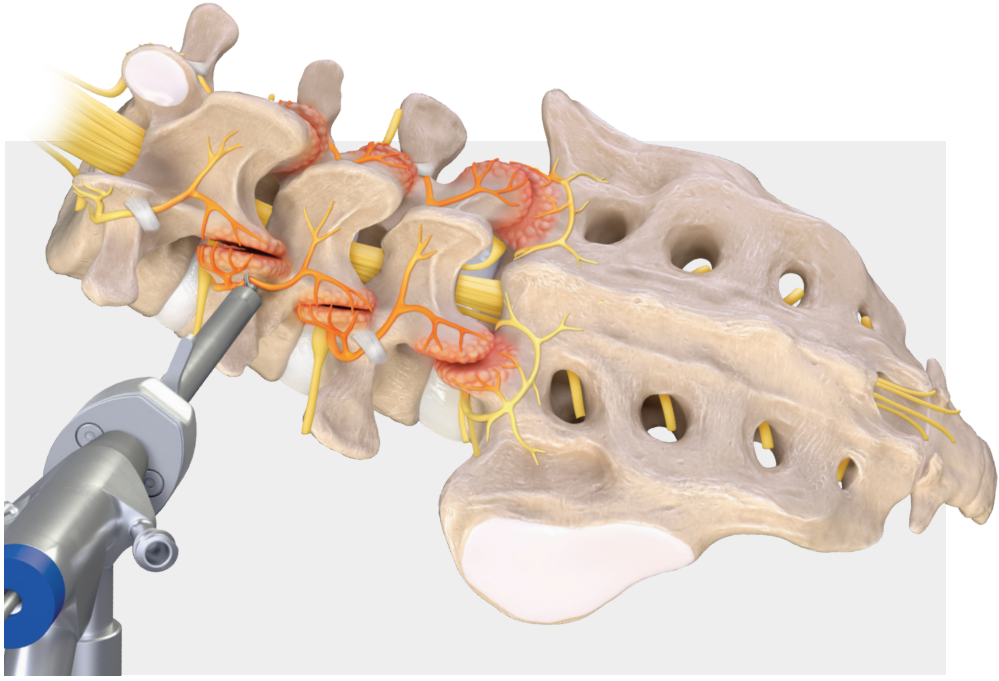
The Procedure

Endoscopic Medial Branch Nerve Transection

To address the impacts of facet joint arthritis, including any pain you may have, your surgeon will use an endoscopic approach to reach and view the medial branch nerve. For each nerve that your surgeon diagnoses as a source for pain, they will make an incision to allow an endoscope to pass through. Each incision is about 1 cm in length.

Once the endoscope has reached the target site, your surgeon will transect, or cut, the medial branch nerve. By cutting this sensory nerve, neural receptors can no longer receive pain signals that are transmitted from nearby joints dealing with arthritis. This has no effect on the motor, or muscular, function of the body.

Your surgeon may prescribe nonsurgical treatments before progressing to a surgical option. This procedure is not for everyone; you should consult with your doctor to learn the best treatment pathway for your needs. The next page will outline who is a potental candidate for endoscopic MBT.



Who Is a Candidate for Endoscopic MBT?

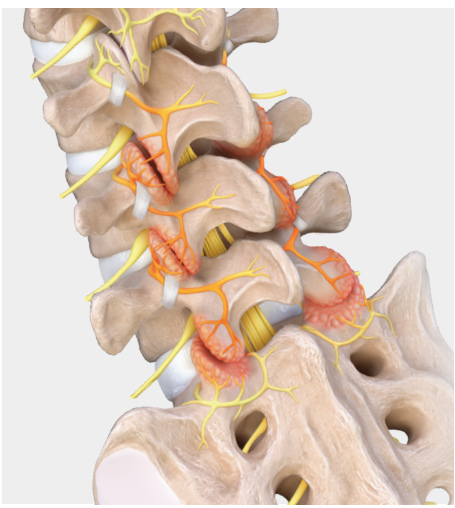
Most patients who undergo MBT have experienced continuous or frequent pain that often limits daily motion and may even interfere with sleep. An endoscopic approach precisely pinpoints the source of your pain and addresses it at the source.

Your surgeon may recommend MBT if other treatments, such as physical therapy, pain blockers, or even another spine surgery, have been unsuccessful in treating any ongoing back problems related to facet joint arthropathy.

Many patients find temporary relief from epidural steroid injections, also referred to as nerve blockers, or radiofrequency ablation (RFA). During an RFA, the nerve is burned using electrocautery. This does not sever the connection of the nerve but damages it enough so that signals cannot be sent or received. These results are often temporary and will require further treatment sessions to continue the feeling of relief. Studies have shown that improved function and decreased pain can last from 6 to 12 months after lumbar medial branch radiofrequency ablation.[8] Additionally, it was found that only 22% of patients reported significant pain reduction at the 1-year postoperative follow-up for their initial RFA treatment.[9]

During a medial branch nerve transection, your surgeon will aim to directly visualize the nerve, permanently sever the connection, then ablate remaining neural (nerve) fibers. By doing so, sensory pain signals from the area can no longer be sent to the brain, eliminating the sensation of pain. A study found that 75% of patients reported significant pain reduction even at their 5-year postoperative follow-up for endoscopic MBT.[10]

Generally, candidates for MBT do not have specific pain, numbness, or weakness (meaning you cannot pinpoint these symptoms to a very specific area they are coming from). Surgery may be an option if your surgeon and treatment team can identify the specific anatomical source of symptoms and the cause is treatable with an endoscope.



Preparing for Your Surgery

Many patients find that learning more about their procedure and hearing from surgeons and other patients help them overcome apprehension about undergoing surgery.

Make sure to discuss any questions and concerns with your surgeon, who may also address the following topics:

- Procedure details
- Surgical risks
- Allergies to medications
- Preparation for surgery
- What to bring to the hospital
- Discharge planning
- Home preparation for after surgery

Your doctor's office will provide you with the information to schedule any required tests, which may include:

- Blood tests
- Urinalysis
- X-ray, CT, and/or MRI scan of your spine
- Medical clearance from a primary care provider or specialty physician

As with all endoscopic spinal surgeries, risks include neurological injury, vascular injury, visceral injury, recurrence, dysesthesia, and incomplete decompression. Additional complications may also occur, including dural tear, hematoma, infection, instability, and facet joint injury.

Arthrex endoscopes and instrumentation are indicated for visualization of the intraoperative site and surgical intervention during endoscopic procedures and minimally invasive surgery involving the spine. Endoscopic spine surgery is generally not intended for patients who have experienced or are experiencing spinal trauma, infection, instability, or severe scoliosis or who have a present pathologic issue.

The information in this guide is general in nature. Be aware that surgical decisions, recovery protocol, and postoperative management are patient-specific and dependent on guidance from your physician.

Leading up to Your Surgery

If there is any change in your physical condition, such as a fever, flu, diarrhea, rash, or cold, please call your primary care physician and your surgeon's staff as soon as possible.

In Preparation for Your Surgical Day

- Bathe or shower the night before or the morning of your surgery. Your surgeon may require you to use a special wash that is available without a prescription to help prevent infection.
- In most cases, fast after midnight the night before and arrive at the hospital / surgery center 2 hours before your surgery.
- Please bring a form of photo identification (eg, driver's license) and insurance cards to present to the patient registration and admission representative(s).
- Speak to the hospital, nursing, and preoperative staff about any concerns.
- Discuss anesthesia options, previous surgeries, and adverse / allergic reactions to anesthesia or pain control with your surgeon and anesthesia specialist.
- Arrange for transportation. It is unlikely your surgeon will clear you to drive immediately after surgery. Therefore, it is best to dedicate someone to assist in your transportation and postoperative care.

Immediately After Surgery

- You will be woken up and brought to the recovery room / postanesthesia care unit (PACU).
- You may experience some temporary postoperative pain, which is typical.
- You will remain in the recovery room for 1-2 hours. Then, depending on the treatment plan discussed preoperatively with your surgeon, you may be discharged home or brought to your hospital room.

The postoperative regimen prescribed by your surgeon should be strictly followed. Detailed instructions of limitations about movement should be discussed with your surgeon.

Physical Therapy: Discuss your daily activity and physical therapy with your surgeon.

Discharge Planning: Your surgeon should share the plan before you go to the hospital / surgery center for your procedure.

Restrictions/Precautions: Ask your surgeon what your restrictions will be following an endoscopic MBT procedure. Your surgeon will provide you with detailed instructions and limitations to your movement and will prescribe a postoperative regimen, to which you should strictly adhere. Keep in mind that there may be limitations to daily activities—such as exercising, bathing, sexual activity, and driving—for a certain period. Most importantly, do not let anyone (family members, etc) force your back into uncomfortable positions.

Returning to Work: Returning to work depends on the demands of your work responsibilities and therefore should be discussed thoroughly with your surgeon.

Infection Prevention and Incision Care: Follow your doctor's instructions regarding dressings or wound care. Do not scratch, cleanse, or apply any creams, lotions, or other treatments to the incision until you have seen your surgeon in the office. Check your wound every day for signs of infection, which may include redness, swelling, increased pain, drainage, a fever greater than 102.5 °F, and/or warmth, especially outside of the dressing. Contact your surgeon's office immediately if you develop any of these symptoms. Typically, if used for wound closure, your sutures will be removed in the office 7-10 days after your surgical procedure.

Example Follow-up Visits

Your doctor will see you periodically to check postoperative imaging, examine your surgical area, monitor physical therapy, and discuss your daily activities. While evaluations may vary by doctor, below are some examples of what might occur during each visit.

1-week evaluation

- Check the site of surgery
- Review prescribed medication regimen and evaluation of comfort level, pain control, and mobility

1-month evaluation

- Check the site of surgery
- Check mobility and evaluate activities of daily living

3-month evaluation

- Evaluate overall recovery progress and address any continuing symptoms or limitations

6-month evaluation

- Evaluate overall recovery progress and address any continuing symptoms or limitations
- Possible further treatment recommendations, such as additional physical rehabilitation or medication

Annual Checkup

Your surgeon may choose to reevaluate you and your back on an annual basis to reexamine your spine, check your range of motion and strength, and obtain new imaging. Follow-up examinations are important and allow your surgeon to provide you with information about your spinal procedure, monitor your recovery, and ensure you are on the path to proper healing.

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Notes

The information contained in this brochure is not medical advice and is not meant to be a substitute for the advice provided by a surgeon or other qualified medical professional on the use of these products. You should talk with your physician or health care provider for more information about your health condition and whether Arthrex products might be appropriate for you. The surgeon who performs any surgical procedure is responsible for determining and using the appropriate techniques for surgical procedures on each individual patient. Arthrex recommends that surgeons be trained on the use of any particular product before using it in surgery. A surgeon must always rely on their own professional medical judgment when deciding whether to use a particular product when treating a particular patient. A surgeon must always refer to the package insert, product label, and/or directions for use before using any Arthrex product. Postoperative management is patient-specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes. Products may not be available in all markets because product availability is subject to the regulatory approvals and medical practices in individual markets. Please contact Arthrex if you have questions about the availability of products in your area.

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