

MINIMALLY INVASIVE SPINAL SURGERY

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What is Minimally Invasive Spinal Surgery?

Minimally invasive surgery is defined as any surgery that uses techniques that decrease tissue trauma, dissection, and blood loss to accomplish the same surgical goals as traditional surgery. It may be in the form of different retractors, different surgical implants, or different bone grafting techniques. The goal is to safely and effectively perform the same operation with as little trauma as possible to the bone and soft tissues that surround your spinal column.

What are some Minimally Invasive Operations in the spine?

1) Minimally Invasive Microdiscectomy

A set of tubular or oval retractors are used to sequentially dilate an area that leads to the disc herniation and the compressed nerve. The potential benefit is that the tissue (muscle and its covering called the fascia) is split instead of detached from the bone. This is thought to result in less scarring of the soft tissues.

2) Minimally Invasive Posterior Fusion

Again, a set of tubular retractors are used to split the fascia and the muscle to gain access to the structures being fused. This includes the surface between the two vertebral bodies (the interbody space) and the surface between the two transverse processes (the lateral gutter or the intertransverse space). Bone graft, bone graft substitutes, and metallic hardware are delivered through these retractors to achieve the fusion.

3) Minimally Invasive Anterior Spinal Surgery

A Vascular Surgeon helps the spine surgeon with this procedure. A small vertical incision is made in the front of your lower belly to expose the spine. This incision is similar to the appendectomy incision. Muscle is split, not cut, to expose the spine and thus there is less pain. Dissection is then bluntly (by hand not sharply with the knife) carried out behind the abdominal cavity. Next, the vascular surgeon safely dissects away the blood vessels that are present in front of the spinal column. Finally, Bone graft, bone graft substitutes, and metallic cages are placed between the two vertebrae (interbody space) to achieve the fusion. This whole process takes a fraction of the time that a typical posterior fusion takes.

4) Minimally Invasive or Percutaneous Placement of Pedicle Screws

Pedicle screws are the main means of immobilization to achieve a posterior spinal fusion in the low back. Recently, new instruments have become available that allow us to safely place these screws percutaneously (with small stab wounds beneath the skin) without much trauma to the soft tissues in the low back. A guide wire is passed into the pedicle with the aid of an x-ray machine called a fluoroscope. Next, a screw with a hollow middle (called a cannulated screw) is safely passed over the guide wire through the small stab wound. The guide wires are removed and a jig is used to pass a rod between the two screws through another small stab wound. A small cap is delivered on top of the rod to lock the screw to the rod.

Why aren't all spinal operations Minimally Invasive?

If your pathology is severe, it may not be safe or possible to perform the operation with the current minimally invasive techniques. Secondly, if you have extensive disease (involvement of many levels in your spine) then it may be far quicker to do the traditional open procedure than multiple minimally invasive procedures.