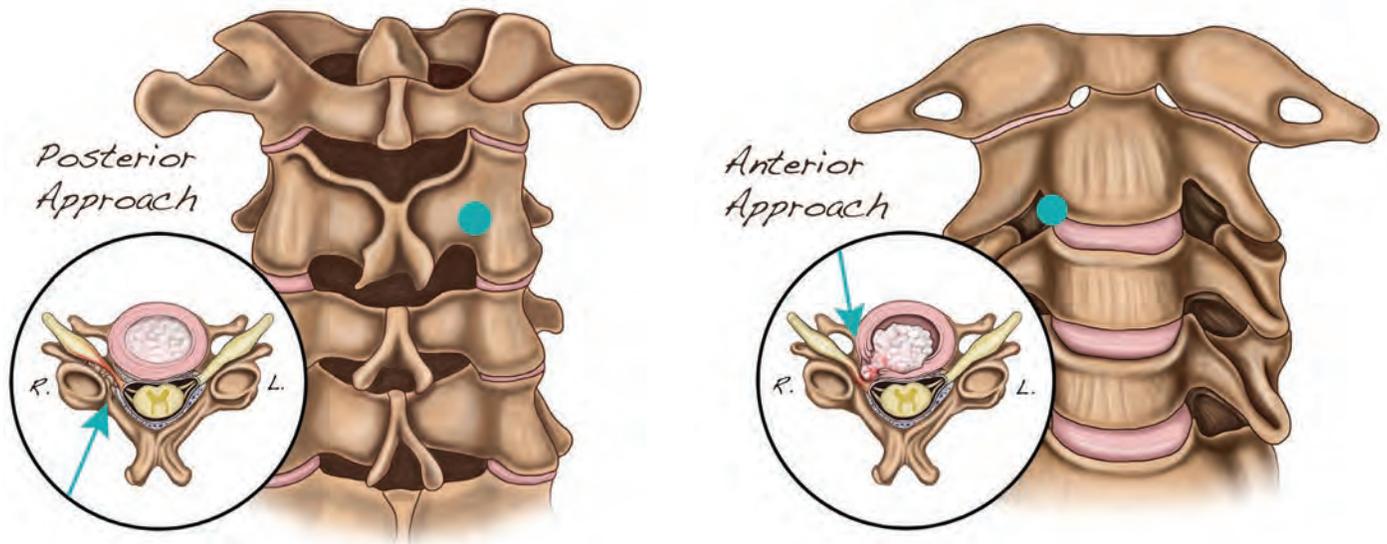


What is Minimally Invasive Surgery (MIS) When Applied to the Cervical Spine?



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Cervical spondylosis is a pathological condition that affects the cervical spine and is the most frequent cause of cervical radiculopathy or myelopathy.

THE MOST common surgical procedure on the cervical spine is the anterior cervical discectomy and fusion (ACDF). For most of the last 30 years, this has been considered the gold standard for managing both radiculopathy and myelopathy. It has been documented to have a 90 percent chance of relieving radiculopathic syndromes and halting the progression of myelopathy. Based on one large database study, there were 771,932 discharges in the U.S. for ACDF between 1990 and 2004. Over this time there was a dramatic, eight-fold increase in the numbers of ACDF procedures, and an amazing 28-fold increase in surgery in patients over 65.

Although believed to be a clinically effective procedure, it is expensive and delayed consequences of spinal fusions have now drawn scrutiny. A condition called adjacent segment degeneration

(ASD) or disease has been recognized for years. Because of symptomatic ASD, many patients ultimately return for additional cervical fusions. Some clinicians are now touting the use of artificial cervical discs (CDA) to preserve motion and, hopefully, avoid the problem of adjacent segment degeneration. However, this technology is very expensive, has risks similar to those of a fusion and has yet to be proven to avoid the issues of ASD.

The point I would make about minimally invasive cervical spine surgery is that many of these larger, more expensive and morbid procedures can be avoided by an accurate clinical diagnosis and outpatient surgical procedures. The two procedures are: 1) posterior cervical foramenotomy, and 2) anterior cervical foramenotomy. Both of these are useful for the treatment of cervical radiculopathy, which is the most common indication for cervical spine surgery.

The posterior cervical foramenotomy was, perhaps, the first decompressive cervical spine operation done routinely and was reported by Mixer in the 1940s. This procedure has been refined in the era of CT/MRI and advanced operating microscopes. With modern techniques, this is an outpatient procedure. In carefully selected patients, the outcomes should be better than 90 percent with resolution of the major preoperative symptoms and they are usually back to nearly full activity within six weeks. Unlike cervical fusions, this procedure does not affect adjacent levels. The entire cost of this procedure is a small fraction of ACDF or CDA. These patients typically return to work and full activity much quicker (e.g., six weeks vs. three to six months) and there are no significant long-term sequelae.

The anterior cervical foramenotomy procedure was pioneered in this country by Dr. H.D. Jho, who published an article in 1996. Most cervical spine pathology (e.g., disc herniation, osteophyte) is anterior (ventral) to the nerve root. Therefore, the safest and often the most efficacious approach to decom-

press the nerve is through the anterior cervical spine. In this operation, we work through a less than 1 inch incision in the anterolateral neck, navigating down the lateral disc space and resecting osteophyte and herniated disc anterior to the cervical nerve root. After this surgery, patients return home within

hours, do not require a cervical collar and typically are released to full activity in six weeks.

There is no perfect operation. All operations have their unique risks, and potential benefits. However, with careful preoperative deliberation based on the patient's history, exam and good scans,

minimally invasive cervical spine surgery frequently represents a better option than either cervical fusion or arthroplasty.

For more information on Minimally Invasive Surgery and other services available at the Santa Barbara Neuroscience Institute at Cottage Health System, visit www.sbni.org

CASE REPORTS: Anterior and Posterior Approaches

First Case Report: CC: 46-year-old RH mechanic seeking a second opinion with respect to "cervical spondylotic myelopathy."

HPI: Over the past year, the patient first developed R-sided neck pain that became associated with R-hand numbness involving the R fourth and fifth fingers of the hand and weakness in the hand. He was treated by a chiropractor and improved. Three months before his visit with me symptoms returned and he became aware of increasing RUE weakness and pain traveling through his axilla spreading to the elbow. He saw another physician, underwent EMG/NCV and was told that his cervical MRI indicated that he needed a 3-4 level cervical fusion and laminoplasty surgery.

PMH: Good health in general and no history of DM.

PE: Motor weakness R lumbricals, abductor digitii quinti, the profundus flexors of his ulnar two digits without atrophy. There was mild triceps weakness. There was no finding of spasticity, pathologic hyperreflexia, LUE weakness, leg weakness or Babinsky responses.

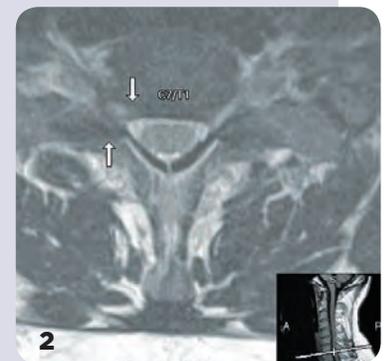
MRI Cspine from outside low resolution but revealed multilevel cervical spinal stenosis as well as questionable R C7-T1 foraminal stenosis (e.g., images 1 and 2).

Repeat Cspine MRI at SBCH better disclosed cervical spinal stenosis from C4-7 and severe stenosis in the foramen on the R side at C7-T1.

DX: The history and PE was felt to be most consistent with a R C8 radiculopathy from foraminal stenosis C7-T1. The multilevel central stenosis was felt to be asymptomatic and therefore not an indication for spinal surgery.

PROCEDURE: R anterior cervical foramenotomy C7-T1 as outpatient.

OUTCOME: Six weeks FU revealed resolution of RUE pain, numbness and weakness and mild neck discomfort. Released to usual work as a mechanic. PT ordered. Five-month FU continuing to do well, working full-time.



Second Case Report: CC: 48-year-old RH contractor with a year of progressive L-sided shoulder and arm ache, frequent numbness extending into thumb and index/middle finger.

HPI: Symptoms increasingly interfering with life style and work, increasingly frequent and often worse with sitting.

PMH: I had performed successful R anterior cervical foramenotomy

C6-7 for C7 radiculopathy 3/11 with good results.

PE: Can provoke arm symptoms by extending neck. No focal weakness or fixed numbness and generally hyporeflexic.

EMG/NCV: Changes consistent with both chronic L C7 greater than C6 radiculopathy.

MRI Cspine reveals diffuse foraminal stenosis L C6-7 and C5-6 from uncinal vertebral osteophytes and facet arthropathy (e.g., images 3 and 4).

DX: The history and PE support a diagnosis of both C6 and C7 radiculopathy from ventral and dorsal foraminal stenosis and C5-6 and C6-7.

PROCEDURES: L posterior cervical foramenotomies C5-6, C6-7 as outpatient.

OUTCOME: Six-week FU revealed normal sensory and motor exam with resolution of LUE pain and numbness and he was back at work full time. There was no significant neck pain. He has continued to do well three months postop.

