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# The Benefits of Minimally Invasive Spine Surgery

MODERN TECHNIQUES IN ORTHOPAEDIC CARE

by Michael Adkins

Not very long ago, all spine surgery was performed through a standard “open” approach. In recent years, modern surgical techniques, advanced technology and an increased understanding of the anatomical structure of the spine have led to an increased use of minimally invasive spinal surgery procedures. These procedures are less painful and provide a faster recovery for the patient — and the surgeons at Johns Hopkins Orthopaedic and Spine Surgery at Good Samaritan Hospital are experts in this field of surgery.

## Background on Minimally Invasive Spine Surgery (MISS)

The instruments and techniques used in modern MISS procedures can trace their roots back to the mid-1960s, when Gazi Yasargil and R. Peardon Donaghy worked together at the University of Vermont to develop less-invasive tactics for treating patients with spinal conditions. Yasargil would later use these techniques upon his return to his native Zurich, Switzerland, in 1967, where he improved outcomes for his spinal patients.

In 1977 and 1978, Yasargil and other surgeons pioneered the use of these same microsurgical techniques, along with the use of an operating microscope, to treat lumbar disc disease. Since then, there have been many technological advances and further research in the field — including developments by researchers at the Johns Hopkins University, who have helped refine the technology used in these procedures, in addition to instructing other surgeons across the country on how to perform these surgeries.

## The Benefits of MISS

“Typically, MISS leads to the same outcomes as conventional spinal surgery,” noted Mesfin A. Lemma, MD, a spine surgeon with Johns Hopkins Orthopaedic and Spine Surgery at Good Samaritan Hospital. “However, it does this with some significant benefits, including smaller incisions, shorter hospital stays, faster recovery periods and less post-operative pain.”

Dr. Lemma’s colleague, A. Jay Khanna, MD, also a spine surgeon with Johns Hopkins Orthopaedic and Spine Surgery at Good Samaritan Hospital, said that the traditional dilemma of spine surgeons has been how to induce the least amount of damage in order to reach a relatively small area of the

spine. “You have to peel away a lot of muscle and other tissue in open surgery just to get [to the spine],” he explained. “With MISS techniques, we can achieve the same efficacy of the surgery itself but with smaller incisions and faster recoveries.”

## Technological Assistance

The breakthroughs that have made MISS techniques possible include advancements in X-ray and fluoroscopic imaging, as well as in the technology used to navigate the interior of a patient’s body without large incisions. “In all MISS surgeries, we make extensive use of image guidance to place our instruments and any implants we may have to use,” Dr. Khanna said. In fact, Dr. Lemma and Dr. Khanna utilize state-of-the-art technology such as the intraoperative 3-D imaging system known as Brain Lab — one of only a handful in the entire state. “We also depend on special retractors and lighting sources, which help us dilate muscles and tissues out of our way, rather than having to cut and move them,” Dr. Khanna added.

“In MISS, our hands are outside the patient, and we’re manipulating the instruments inside, so precision is critical,” Dr. Lemma added. “It’s somewhat like building a ship in a bottle, only much more complex.”

## Considering Surgery

Usually, when it comes to spinal conditions, surgery is the last resort for treatment. A spine specialist will work with patients on various conservative treatment methods, including physical therapy, pain management through non-steroidal anti-inflammatory drugs (NSAIDs), epidural injections and other approaches.

According to information from the Society for Minimally Invasive Spine Surgery, if patients do not show improvement within six to 12 months of using these conservative treatment methods, or if their conditions get worse, they and their physicians may want to consider surgical approaches to correcting their conditions. However, it is ultimately the patient's decision to make, with input and guidance from his or her physician.

The type of surgery required can also be a determinant as to whether or not MISS techniques can be used. *(Editor's Note: Please see the sidebar on page 17 for more information.)*

## A Patient's Perspective

For some patients, surgery is the primary treatment approach for their spinal conditions, as was the case for John McDonald of Elkin

City, Maryland, in October 2010. "About four weeks before I first saw Dr. Lemma, I remember feeling a stabbing feeling in my back," Mr. McDonald recalled. "It was to the point I couldn't stand or lie down for more than an hour or two at a time. Standing was the only way to get the pain to back off me for a while."

After a visit to his local emergency room and an appointment with his general practitioner, Mr. McDonald was told he needed to see an orthopaedic surgeon "as quick as I could," he said. After an examination and an MRI, Dr. Lemma diagnosed Mr. McDonald with a large herniated disc in his lower spine and recommended a MISS procedure to correct the condition. "From what Dr. Lemma could see with the MRI, along with the fact that I was losing strength in my leg, he recommended that we do surgery sooner rather than later," Mr. McDonald explained.

Today, Mr. McDonald has just a one-inch scar on his back and is extremely happy with his MISS results. "Dr. Lemma removed my herniated disc, and I've been pain-free since the morning after the surgery," McDonald said. "Before, it was constant pain — to the point of exhaustion — and I was sleeping maybe four hours a night. Now, I can get a good night's sleep, and I'm back to my normal life."

## SPINE SURGERY

A. Jay Khanna, MD

Mesfin A. Lemma, MD

Robert M. Peroutka, MD

### Conditions Treated:

- Cervical, thoracic and lumbar stenosis
- Cervical, thoracic and lumbar disc herniations
- Myelopathy
- Spine tumors
- Spine trauma
- Vertebral compression fractures
- Rheumatoid involvement of the spine
- Adult scoliosis
- Adult kyphosis
- Osteoporotic spine fractures
- Multiple myeloma involvement of the spine

## A Philosophy of Care and Comfort

It is important to note that not everyone is as ideal a candidate for MISS as Mr. McDonald was, either because a specific spinal condition may not be treatable through MISS techniques or because a patient's particular situation may not warrant surgery. The only way to know if a patient should be treated through MISS techniques is to speak with a spine specialist.

"Generally, our goal is to provide the best long-term pain relief for our patients while using the least-invasive methods possible," Dr. Lemma stated. "Our treatment plans are always customized to each individual patient."

"For most patients, we don't end up recommending any surgery at all," Dr. Khanna declared. "Dr. Lemma and I both strive to only perform surgery when it's absolutely necessary — and if it is necessary, we use a multi-disciplinary approach to determine the best surgical approach and to do only what is absolutely necessary for the patient."

For Dr. Lemma and Dr. Khanna, as well as the other professionals at Johns Hopkins Orthopaedic and Spine Surgery



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We educate surgeons all across the country on MISS techniques. Here, Dr. Khanna is instructing a group of surgeons on the latest procedures.

at Good Samaritan Hospital, the focus is always on how to use their extensive knowledge and expertise to best help each patient they see. “We hold ourselves to the highest standards,” Dr. Khanna said. “We are highly trained in these procedures, and we have helped train other surgeons across the country in MISS techniques. We have a strong clinical and academic interest in these procedures and in ensuring that we do the best we can for our patients.”

And for patients like Mr. McDonald, that dedication to excellence makes Johns Hopkins Orthopaedic and Spine Surgery at Good Samaritan Hospital a trusted resource. “I was in so much pain before that I would have been happy to have *any* sort of surgery,

let alone surgery that’s minimally invasive and easier to recover from,” he stated. “I couldn’t have been happier or more pleased with Dr. Lemma and the staff. If I knew anyone with a similar problem, I wouldn’t think twice about recommending that they have [a MISS procedure] performed.”

*Mesfin A. Lemma, MD, is division chief of Johns Hopkins Orthopaedic and Spine Surgery at Good Samaritan Hospital, co-director of spine surgery at Good Samaritan Hospital and an assistant professor of orthopaedic surgery at the Johns Hopkins University.*

*A. Jay Khanna, MD, is an associate professor of orthopaedic surgery and biomedical engineering at the Johns Hopkins University and co-director of the Division*

*of Spine Surgery at Johns Hopkins Orthopaedic and Spine Surgery at Good Samaritan Hospital.*

*Dr. Mesfin A. Lemma and Dr. A. Jay Khanna were recently named to the prestigious Becker’s Orthopaedic & Spine Review’s list of “100 of the Best Spine Surgeons and Specialists in America.”*

*Drs. Lemma and Khanna can be reached at 443-444-4730.*

*For more information about MISS, please visit:*

- [www.hopkinsorthogsh.com](http://www.hopkinsorthogsh.com)

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## MAKING THE MOST OF MISS

For patients with chronic, severe spinal pain, the thought of being able to live a normal life again might seem like a mere fantasy. There are numerous spinal conditions that can be treated using MISS techniques. These conditions include, but are not limited to, the following:

- Cervical and lumbar herniated discs
- Cervical and lumbar spinal stenosis
- Spondylolisthesis (a condition in which a vertebra has slipped forward over the one below it)
- Degenerative scoliosis
- Spinal malignancies
- Spinal trauma

There are a number of advantages to MISS as opposed to traditional open surgical techniques, including:

- Less pain after the surgery
- Smaller incisions
- Less scarring
- Less tissue damage
- Less blood loss
- Less time away from work or recreational activities

Another major advantage of MISS techniques is the fact that they typically require a much shorter hospital stay after the operation than traditional spinal surgeries. “Some patients can go home the same day of the surgery,” Dr. Khanna noted. “Most often, however, a hospital stay is necessary, but it’s usually as short as one to three days after the procedure, depending on the type of surgery.” Hospital stays for traditional spinal surgeries can be double the time required for MISS procedures, if not longer.

As leaders in the field of minimally invasive spinal surgery, the surgeons at Johns Hopkins Orthopaedic and Spine Surgery at Good Samaritan Hospital are ready to help patients determine if

these MISS techniques can help them find relief. “MISS represents the wave of the future in spinal surgery,” Dr. Lemma said. “If you’re considering spine surgery, please consult with your physician to see if you would be a candidate for a minimally invasive technique.”

Computer Assisted Spine Navigation used at our center allows for better precision and less soft-tissue trauma.

