

**MINIMALLY INVASIVE SPINE SURGERY FOR HERNIATED LUMBAR DISCS
ROOSEVELT HOSPITAL
NEW YORK, NY
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ANNOUNCER: Welcome to Roosevelt Hospital in New York City. Over the next hour, you'll see a METRx micro endoscopic discectomy to treat a herniated lumbar spinal disc performed live. In just moments, you'll learn how this minimally invasive surgical technique can provide relief of severe lower spine pain while eliminating surgical trauma to the surrounding muscles, which dramatically reduces recovery time. The surgery will be performed by Dr. Noel Perin, an internationally known neurosurgeon specializing in disorders of the spine. OR-Live makes it easy for you to learn more. Just click on the "Request Information" button on your webcast screen and open the door to informed medical care. Now, let's go to the operating room.

00:01:07

ERIC H. ELOWITZ, MD: Welcome. My name is Eric Elowitz. I'm a doctor and attending of neurosurgery here at Roosevelt Hospital and co-director for the Center of Minimally Invasive Spine Surgery with Dr. Noel Perin. Dr. Perin is behind me, he's already started a lumbar discectomy using a minimally invasive technique. The patient today is a 50-year-old man who's had several months of pain radiating down the right leg, basically sciatica. He's had extensive conservative treatment, and at this point, the MRI scan shows a large herniation on the right side at L-5/S-1, which is one of the most common locations to have this type of disc herniation. Let me just introduce Dr. Perin, who is performing the surgery.

00:02:04

NOEL PERIN, MD: This is -- I'm working on the right side of this patient's back. We've made a small incision, which is 16-18 millimeters, and we place these tubes to open up the muscle layers such that we don't cut the muscle but in fact spread the muscle out. And then what we effectively then do is make a little window in the back of the spinal canal, removing about a centimeter or less of bone and ligament to look down into the area where the disc herniation is. So here we have -- we're looking down the tube. This is the tube that you can see. We're using the operating microscope. We can use the operating microscope or we can use the endoscope, both of them work equally well. In some of the larger patients, we have to use the endoscope. In a patient who's of a reasonable size, we can use a microscope, which gives you three-dimensional view, as opposed to the endoscope, which gives you a 2-D view. So here I have taken some of the bone, and you can see some of the ligament here. And we're looking at some of the structures deeper here. There you can see his nerve there, and I'll let Dr. Elowitz talk to you a little more about this before we show you more detail.

00:03:43

ERIC H. ELOWITZ, MD: The -- one of the main problems that we treat here at the Center for Minimally Invasive Spine Surgery is herniated discs. They're an extremely common problem. We see numerous patients, probably operate on close to 200 patients a year just for this specific problem. In general, we still have a very

conservative approach. Not everyone who has a herniated disc is necessarily going to need surgery, and as in this patient's case, had physical therapy, epidural injections, multiple medications in significant time. But once a patient still has this type of disabling problem and an MRI scan shows this type of herniated disc, surgery is a very effective minimally invasive approach. The type of surgery that Dr. Perin is performing right now, it generally takes anywhere from 30-60 minutes. Patients are up and walking the same day. And many patients even go home that same day doing this often as an ambulatory basis. Basically what's involved with this type of surgery is the patient is in the prone position where the patient is on his stomach. We make a small incision, and using x-ray guidance, a tube is placed. As you can see through that type of tube, the work is done. Once the tube is brought in, then we use the microscope or endoscope as Dr. Perin described. I can state that the -- with this type of an operation, patients have significant relief of the pain once that fragment of disc is removed. And often even in the recovery room, patients notice a huge improvement in the type of leg pain that they're having. With -- what Dr. Perin has already done is removed a small window of bone. We take advantage of a natural opening between the bones in the back of the spine between the lamina and then create the window, expand it just a little bit with a drill and some other bone instruments to expose the nerve and the area where the herniated disc is. Once the disc fragment is seen, that's removed away. Perhaps I can show you on the screen here again where Dr. Perin is working. This is the tube. The size of this tube is really not much larger than the pen that I'm using here. The instruments Dr. Perin are using are all micro-instruments, and you're really seeing the exact view that Dr. Perin or any of us use when we're doing this type of surgery. We have our assistant, and today Dr. Deshtandon, who's one of our neurosurgery residents, using a very small little retractor just to hold the nerve back. Dr. Perin is dissecting some of the soft tissue away to help expose the area of the disc, which would be in this location. Specifically in this patient, we know that the MRI scan shows a large fragment of disc that has extruded, come out of the disc space. Often when I'm talking with patients, I'll describe this basically like the toothpaste that has come out of a tube. Once this is out, it does not go back in. Sometimes over time it may dry up, but not always. And in situations such as this and in this patient, by removing this fragment of disc and relieving the pressure from the nerve, the pain is relieved. Here at the Center for Minimally Invasive Spine Surgery, where Dr. Perin and I are co-directors, we really are dedicated to performing these type of minimally invasive surgeries. One of the advantages of minimally invasive surgery are -- there have been multiple advantages. Not only are there smaller incisions and quicker recovery times, there's less blood loss and much less trauma to the surrounding tissues. We've really taken advantage of many of the new techniques and advances in technology to create these minimally invasive spine surgeries. What -- the type of procedures that we would've done just several years ago, involving very large incisions, often a lot of muscle retraction, sometimes days in the hospital, weeks of recovery, can now be done in a much quicker, far less invasive fashion. Here at the Center for Minimally Invasive Spine Surgery, we treat multiple type of problems. Not only these type of herniated discs both in the lumbar and cervical spine but spinal stenosis, which is a common entity affecting patients in all age ranges, though sometimes in the older age groups, spondylolisthesis, which is a slippage of -- between the vertebrae in the lower spine, scoliosis, which is a curvature of the spine, of course, back pain, and the type of sciatica. Dr. Perin also specializes in hyperhidrosis treatment, which is excess sweating in the extremities. And that is also treated in this minimally invasive surgery. One of the main advantages that we find, especially with some of the larger procedures such as the fusion operations, is that the surgery itself is far less traumatic to the surrounding tissues. Using the same type of tube that we're using

today, the patients will have an easier corridor. Now in terms of the surgery, I think, Dr. Perin, are you seeing the disc space here?

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NOEL PERIN, MD: Yeah, so we have the exposure here, so what I have is, on the right side, you can see, if I use an instrument to show you, so this is the nerve here. This is the nerve. You can see the nerve there, right? The rest of the sac containing the nerves is against this tube, pushed inside, and then I will hold that nerve back, and this is the disc space that we are looking at. You can see this white thing here, this is the disc. So we're going to cut into this now and then remove some of the disc from inside the space, and then we will start looking for also that fragment that we said had come out of the disc space and was sitting free. So we'll first reduce some of the pressure by taking, cutting into this disc before taking -- looking for the other fragment. So here I'm using a bayoneted knife to cut into the disc. As Dr. Elowitz just said, the disc itself is a soft material.

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ERIC H. ELOWITZ, MD: Maybe we could see -- could see what Dr. Perin has described is that the nerve is being slightly retracted medially, more toward the center. And this whitish area here is the disc that is herniated, causing pressure on the nerve. We have received some e-mail questions and could start to answer these. There is a question from Michael, age 48, who asks: I have been diagnosed with a herniated disc, can bad posture over time cause this type of herniated disc? Well, the answer is that we don't always know what causes a herniated disc in any specific patient. Often we will see herniated discs when patients have a certain amount of disc degeneration, which happens naturally over time. Sometimes we'll see this type of disc degeneration even in very young patients. Most of the patients that have this type of a herniated disc that come to this type of minimally invasive micro discectomy tend to be in the younger age groups. Often patients will say to me, "I'm too young to have this problem." And in fact, most of the patients that will have this type of herniation tend to be even in their 20s or 30s. I've even operated on several high school students with this type of problem. We don't always know what causes this degeneration or herniation. Most of the time, there is no history of trauma or accidents or heavy lifting. Occasionally there is, but for the most part, it's just something that happens and we don't always have an answer. Bad posture may or may not affect it. Certainly not all of us have the best posture, so I can't say specifically that that is a true cause. I have another question, e-mail question from Brian, age 40, and he asks: I've been told that I need a spinal fusion, can this be done in a minimally invasive way? The answer is most of the time, yes. The -- first off, we tend to be very conservative in terms of when to recommend fusions. Patients that I see and Dr. Perin sees, we really want to make sure that patients have had full extensive conservative treatment. In patients that do require spinal fusions, the outcomes can be excellent. And most of the time, this can be performed in far less invasive techniques. The traditional type of spinal fusion is performed either from the front of the abdomen or from the back with a very large incision in the back, a lot of muscle retraction. With some of the newer techniques for spinal fusion, we can do those through small tubes from the back, removing the disc, replacing the disc with a spacer, and often using titanium screws, again, using x-ray guidance to put them in rather than with a very large incision, a lot of muscle retraction. There's also a newer procedure that we have been performing on a very routine basis at this point, the XLIF procedure, which is extreme lateral interbody fusion, which is appropriate for the L-4/5 level and above. And that is performed from the side, from the flank, and this can also be performed minimally invasively rather than the traditional fusion. Of course, every case is different, and specifically in your case, Brian, we would have to evaluate your case and see if you were an

appropriate candidate first for fusion and more than likely for the minimally invasive type of fusion.

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NOEL PERIN, MD: Okay. Give me the suction retractor.

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ERIC H. ELOWITZ, MD: We have another question from Dawn, the question is: My sister has been suffering with a herniated disc for almost three years now and is scared to get any type of surgery done, so I would like more information on this for her, thank you. Well, certainly as I discussed, we generally will try to advocate conservative measures first with herniated disc. Eighty, ninety percent of patients with herniated discs are not going to need surgery, but in patients that have had conservative treatment, have given this plenty of time, have been seeing appropriate doctors and have had the right therapy, then surgery may be a very good option. I've had many patients come to me and see me -- I saw a patient just the other day who said, "My biggest mistake was waiting extra months before having this type of surgery." Typically with this type of micro discectomy in the appropriate patients, they're up and walking within a matter of hours, home the same day, and often back to work within just a few days. I do -- we do ask at least for the first several weeks to curtail some very physical activity in terms of heavy lifting or weight lifting at the gym, but in terms of most routine activity, can be done very quickly. And ultimately, the prognosis is excellent. I always tell patients that the main goal of surgery is to get the back active and functioning and comfortable, and if that can be done without surgery, great, but in some situations, it is necessary. Ultimately, patients go back to full activity. They go back to skiing and tennis and golf without any limitations.

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NOEL PERIN, MD: Okay. So here we have -- I can show you, I'm pulling, I'm bringing out some pieces of disc. This is the disc space. As you can see, this whitish area -- give me a pen, please. This area, the whitish area, is the disc itself. The disc, the classic description of a disc is that it looks like and feels like crab flesh or lobster. As you can see, it's white, it's soft, and I've opened into the disc space. I've opened the covering of the disc space and I've started removing some pieces. And it's already freed up the nerve quite significantly. And then I'm going to go looking for that other piece that we thought was floating around to make sure that we get every piece that is causing pressure on the nerve. So I'm going to keep working inside the disc space. I've got -- that's the space that I was talking about. Okay. Can you focus this? Okay. So there it is focused there. Give me the Decker, please.

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ERIC H. ELOWITZ, MD: So what Dr. Perin is using at this point are some of the instruments to remove fragments. That was another fragment that was just removed. Often once the disc herniates, it will spread -- push out multiple pieces. It's not often just one large fragment of disc. Most of the time, it's multiple pieces, and I think we're seeing some big fragments coming out right now. I think you can imagine just from looking at this type of procedure and these type of fragments coming out that they will not always resolve on their own but may need this type of microsurgery to remove.

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NOEL PERIN, MD: Okay. So give me the bayonet forceps.

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ERIC H. ELOWITZ, MD: With this type of surgery, when we do this type of procedure, we could really visibly see the nerve become free. Often, for instance, I'll open up and see a very large piece of disc right under the nerve. The nerve can be thinned. And once the fragments and pieces of disc have been removed, the nerve is quite free. Often we'll see some nice pulsations of the nerve, which indicates that the

pressure is off. And then that's a good indication to me that the operation has been a success and able to close.

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NOEL PERIN, MD: Okay, give me that Decker, please. I think that's a fragment. Okay, this is the big fragment we're just trying to free up here. You can see, it's actually outside the space. Now I'm blocked. Okay. Okay, give me the nerve fork that goes to the left. We need to move the scope, but...I guess...

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ERIC H. ELOWITZ, MD: And just looking at the screen, this is probably the key point of the operation, where the fragment is being mobilized. The fragment itself is right - - this area here. Dr. Perin is moving that very gently away from the nerve. Once -- and he's using a certain type of an instrument, pituitary rongeur, to resect that away from the nerve. Sometimes once a disc has been there for some time, there may be a little bit of scar tissue. But this can generally be fairly easily removed.

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NOEL PERIN, MD: I'm going to move the scope a little. There.

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ERIC H. ELOWITZ, MD: One of the questions, another e-mail question while Dr. Perin is moving the scope there, is from Michael, age 48. Michael asks: if I had this procedure, how long would I be in the hospital? And typically with this type of lumbar minimally invasive micro discectomy, patients are out of the hospital the same day, within a matter of hours. For instance, if the surgery is done in the morning, most patients are out by later in the afternoon.

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NOEL PERIN, MD: Okay, give me the knife again.

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ERIC H. ELOWITZ, MD: Another question from Bruce from Pennsylvania, and he wanted some information on thoracic herniations. Thoracic disc herniations are relatively uncommon, although we will see them from time to time. Often these can cause more severe neurologic problems in addition to pain. It can also cause pressure on the spinal cord, causing leg weakness or numbness. There are several options in patients that do need surgery for thoracic herniations. Here at the Center for Minimally Invasive Spine Surgery, Dr. Perin does specialize in the thoracoscopic removal of these type of herniations, working with one of our thoracic surgery colleagues, Dr. Cliff Connery. They will use small endoscopes through the chest in order to remove the herniation. This spares the patient the very large thoracotomy type of incision and surgery. I think we could -- we could see from looking at Dr. Perin's operation working, you could see that the whitish tissue, almost like, as Dr. Perin described, crab meat coming out in a piecemeal fashion away from the nerve. And there's another larger fragment coming out. And that looks like -- that looks like the main part of the fragment. There's another fragment coming out, and looking at the -- looking at the procedure, again, looking at the procedure, the nerve root is coming along, is this whitish structure. You can see that here, sort of glistening. And the dura, the membrane, over the nerve. The darker space underneath is the disc itself, and those whitish pieces are the fragments which Dr. Perin has been able to remove. Already the nerve appears to be at least partially decompressed or mostly decompressed and there's much more room around the nerve and underneath the nerve than initially. And again, this is -- you can see the whitish structure here is the nerve itself. And the disc material coming out from within the disc space just over in this location. I'll just answering -- there are a couple of other recent e-mails we've gotten. A patient, Edward, e-mailed: when you have three problems in three locations with bulging discs, herniated discs and stenosis, would you do this procedure in the herniated area only? The answer is that every case is specialized. It

is quite common for us to see patients that have multiple herniated discs. Usually, in fact, if a patient has a very large herniation, we may see some smaller degree of herniation at the other levels but may choose only to operate on the area that is causing the major problem. So much of it depends on the patient's symptoms as well as the -- what we'll see on the MRI. There are many cases where I've operated on two discs at the same time, although generally be in favor of removing just the most symptomatic of the levels and trying to keep the surgery as minimal as possible but of course yet ensuring the best long-term results.

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NOEL PERIN, MD: Something underneath the dura.

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ERIC H. ELOWITZ, MD: Another question, e-mail question by Neil, stating that he had a herniated -- diagnosed with herniated disc in 2005, had improvement with steroid injections, but with a continued numbness as well as pain in the back, buttocks, and foot after a three-year period; would surgery correct any of this? And the diagnosis was L-5/S-1 disc with small protrusion of a disc bulge. There still is a disc herniation which contacts the central and right S-1 nerve root. Certainly at this point with continued pain and based on a recent MRI that would show a herniated disc, if the majority of the patient's symptoms are in the leg and there is compression of the nerve root, then surgery would certainly be a consideration. In general, we would see a better prognosis in patients if the surgery was performed earlier than three years because what we could do, what any of us could do, is to get the pressure off the nerve, but it often does take time for the nerves to heal. The longer the time there's been pressure on the nerve, often the longer the healing process. And there may always be some degree of nerve irritation or inflammation, but even still I would not say that three years is necessarily too long a period of time and would clearly consider surgery in -- in the appropriate patient. Another question: is the METRx procedure done for bulging discs with impression on the S-1 nerve root resulting in sciatica? And the answer is yes. This type of an operation is very common for this type of herniated discs. Sometimes the concept of bulging disc versus herniated disc is often a matter of degree. And what is most important to me when I'm evaluating a scan and a patient is the amount of pressure on the nerve and the amount of pain and limitation the patients have. I'll often ask patients, "Well, how much is this limiting you? Is this preventing you from doing any of your activities?" If the patient is still having significant pain and limitation and the MRI scans show that there is pressure on the nerve, that's really the bottom line. Sometimes patients may have bulging discs, but with other bone spurs or spinal stenosis that may in and of itself cause nerve root impingement and compression. And looking -- just going back to the surgery itself with Dr. Perin, it does appear that the nerve root is becoming much more decompressed.

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NOEL PERIN, MD: So we've taken -- some of these fragments, because he's had these symptoms for some time, were pretty stuck. But as you can see, there's the nerve root, there's the disc. We've opened into the disc. There we have an opening into the disc. We've removed most of the fragments. I've got an instrument under the nerve, which is flowing much more freely than it did at the beginning. And I think we are pretty much done here. I'm going to irrigate the disc space to make sure there are no free pieces of disc floating around, and I think we'll be done with that. Now, this patient will be able to get up and walk around hopefully later on in the day. And he may stay overnight or he may go this evening. Irrigation. And...

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ERIC H. ELOWITZ, MD: What we're seeing now is irrigation fluid into the disc space. Sometimes just by adding some additional irrigation, may float out several additional

fragments away from the nerve. But as you can see looking through the tube, the nerve itself is free, is pulsating well, and that's really the best indication of a good result. Patients always ask me, "What are the potential risks of this type of surgery?" And in a general sense, really one of the safest, least invasive surgeries that we do. We're not dealing with the spinal cord, so there's no risk of weakness nor paralysis with this type of lumbar surgery.

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NOEL PERIN, MD: Okay. So we're pretty done here. I'm just making sure we have not missed a fragment, so...

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ERIC H. ELOWITZ, MD: The use of these type of tubes has really revolutionized the field of minimally invasive spine surgery. For the patient, the benefits are multiple. Not only there are smaller incisions but much less retraction of the muscle. When we're putting in these type of tubes, really use a small tube and dilate over it so that there is no cutting of the muscle itself. It's basically a gentle dilation. Once the tube is removed, the muscles just float back into the natural position. And we find certainly far less discomfort after this type of a procedure. Most of the patients in fact will tell me that the discomfort of the surgery is far less than what they've been living with in terms of the sciatica. What Dr. Perin just used was some of the compounds to help prevent any type of bleeding in the area. Generally the type of blood loss with this type of surgery is minimal. Often not any more than just a few cc's or less than a teaspoon, for instance.

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NOEL PERIN, MD: So we're pretty much done with the operation. So what we did here was that we -- with the tube which was six centimeters long, which is -- the length of the tube depends on the size of the patient and the diameter of the tube is 18 millimeters. You can do it through a 16 in a smaller patient. And we created a little window, we got in there. there was a lot of adhesion there. Adhesion there because of the disc having been there for a long time. One patient had several epidural injections. All of those things sometimes cause quite a bit of inflammation, and the inflammation causes everything to stick together. So makes it a little bit difficult when you have multiple treatments for protracted periods of time. So that showed you why we had some difficulty sort of freeing up the nerve completely, but the disc space itself is quite free. We usually take some disc from within the disc space to reduce the -- what is called intradiscal pressure, the pressure within the disc. At the same time, we took out the fragments that were lying free outside the disc and underneath the nerve, which was what was causing a lot of his pain and numbness as well as the weakness that he had. And typically, these patients, the pain improves first, because the pain fibers are the quickest to recover. The weakness improves second. And numbness and tingling is usually the last to recover. And that's the way the nerves recover. Sometimes with the patients, as soon as they wake up, they will say all of their symptoms are pretty much gone. Sometimes some of the numbness and weakness will remain. Sometimes takes a few weeks to -- sometimes up to a month to recover. It depends on how long you've had your symptoms. The longer you've had your symptoms, the longer it takes to recover as well. So if somebody's had symptoms -- now, this gentleman has had these symptoms for close to a year, so it also means that it could take some time because there can be some changes in the nerve that may need to recover. But typically, most of the patients will recover all if not most of their function, because from our point of view, we can't make the nerve recover. We can take the pressure off the nerve and give the nerve the best environment to recover. And as I said, in 90% or more, most of these symptoms will recover. And the question is whether everything recovers immediately versus takes a few weeks sometimes for the weakness and

numbness to come back. So we're just going to irrigate a little, make sure there's no oozing. And once you've got that, we're going to take the tube out. As we take the tube out, the muscles will fall back into position, and then we'll put some stitches in the muscle as well as in the skin, but absorbable sutures underneath the skin and that are not visible on the surface.

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ERIC H. ELOWITZ, MD: I think we have time for another e-mail question. Everyone - this is from Michael, age 32: everyone gets back pain from time to time, how do I know when something is really wrong and should see a doctor? Certainly you're correct that just about everybody has back pain from time to time, it's one of the most common reasons that people see their physicians. Really the warning signs, what we'll call the red flags, are back pain that continues for some time or may get worse. Other red flags would be if there is weakness into one or both legs, if there is significant numbness or tingling, if there's bladder or bowel difficulties. But if -- certainly if back pain was to continue, it is important to see a physician. And if any of the red flag or warning signs come up, should see a physician very soon. Often when -- if someone has chronic back pain, what should they do, who should they see? Often their primary doctors first, often see rehab doctors or physiatrists, neurologists, often neurosurgeons to have their back pain evaluated. And if there's sciatica involved, that usually will indicate that there's a herniated disc and pinching or pressure on a nerve.

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NOEL PERIN, MD: Okay, I think we're done. I just -- straight. So -- yeah.

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ERIC H. ELOWITZ, MD: Yeah, that looks very free.

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NOEL PERIN, MD: Right. So I'm underneath. You can just see that the nerve root is nice and free, it's moving freely. Because when I started, it was pretty stuck. So I think I'm done, and the -- you might think that I'm moving that nerve root quite a bit. You're looking at it under 20x magnification, so it looks like we're moving it a lot. Plus, the nerves in the lumbar spine can tolerate a little manipulation, and so we typically know how much you can move these nerves.

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ERIC H. ELOWITZ, MD: Just have a few other e-mail questions. Here's a question from Tara: what are the postoperative complications after minimally invasive spine surgery? Are these complications less than in open surgery? Generally with this type of micro discectomy, the most common complication, the most common thing that we may see is a recurrent herniation over time. The risk of that is about 3-4%. So 95-plus% of the time, we do not see that and does not always mean that any additional surgery is required. The complications of this type of surgery in terms of scar tissue around the nerves and around the muscles is clearly less than in open surgery and rarely even see that. Another question from Charles: working in such a small area, how difficult is it to keep from injuring the nerve? Are the instruments used during this operation sharp enough to do something like this? As neurosurgeons, one of our chief goals is to prevent nerve injury, and with skill and using microscope and the endoscope, we are really able to see the nerve, and the manipulation of the nerve is really quite minimal, even in an operation like this. The instruments that we use for the most part are fairly blunt, and it is really exceptionally rare to have a nerve injury. It's really something that you will very rarely if ever see with this type of surgery.

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NOEL PERIN, MD: Okay. So --

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ERIC H. ELOWITZ, MD: Another e-mail question from Edward: is this type of surgery being done in many parts of the country or do you specialize in it at Roosevelt? There are other areas certainly around the country where doctors are doing this type of micro discectomy, but here at Roosevelt, we -- and the Center for Minimally Invasive Spine Surgery -- we do specialize specifically in this type of surgery as well as other minimally invasive surgeries, including fusions, laminectomies, and endoscopic type of surgeries.

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NOEL PERIN, MD: Okay. So we're done here. The nerve is nice and free. You can see that it's -- you can almost see that it's pulsating. That's one of the things we look for, that the nerve pulsates with the beats of the heart. Sometimes when it's under pressure, those pulsations are not transmitted to the nerves and they don't pulsate. It is pulsating, and you can see, it's nice and free. Give me a nerve hook. And I typically try to put a fine instrument underneath to make sure that nothing is underneath it. And you can see, I can run this instrument freely, and that tells me that I'm quite free. And this is where the disc was based on the MRI, so we know we've freed it, freed the disc up, and as soon as we're comfortable with the oozing and everything else looks good, we are ready to pull the tube out and close the wound.

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ERIC H. ELOWITZ, MD: Once the tube is removed, this type of wound is closed usually using a plastic surgery type of technique so that for the patients, there's generally no sutures or staples that need to be removed because the incision itself is so small.

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NOEL PERIN, MD: Well, I guess I'm ready to come out whenever these guys are ready.

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ERIC H. ELOWITZ, MD: So --

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NOEL PERIN, MD: Yeah, I can -- I'm done here.

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ERIC H. ELOWITZ, MD: Do you have any final thoughts, Dr. Perin?

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NOEL PERIN, MD: I think that's -- you've said everything else. I think we are ready to kind of pull the tube out. So I'm going to place a piece of material that helps with the bleeding. It has some clotting factors in there. so I'll place it in there, and that helps with the stopping any oozing. And then once we are comfortable that everything is nice and dry, then we'll take the tube out and start the closure of the wound.

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ERIC H. ELOWITZ, MD: Well, I think that that was a really beautiful indication and demonstration of this type of micro discectomy and relief of pressure from the nerve. So I'd like --

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NOEL PERIN, MD: So we'll take the tube out now, I guess. Hold on.

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ERIC H. ELOWITZ, MD: And once the tube is removed, then the incision is closed.

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NOEL PERIN, MD: Keep the scope, because they're photographing, right?

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ERIC H. ELOWITZ, MD: I think you could have an indication of the size of the incision, which is really quite small.

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NOEL PERIN, MD: Okay. Okay.

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ERIC H. ELOWITZ, MD: So I'd like to, you know, thank everyone for their attention in watching this live webcast from Roosevelt Hospital and the Center for Minimally Invasive Spine Surgery. I think the take-home message here is that patients with herniated discs in situations where surgery is necessary, this can be done in a safe and minimally invasive fashion, and the goal would be to get patients back to active and functioning and comfortable, and this can be achieved in a minimally invasive way. Thank you very much.

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NOEL PERIN, MD: Okay. Yeah, I think Dr. Elowitz has said --

00:50:33

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