

MINIMALLY INVASIVE DISC REPAIR USING THE METRX[®]
SYSTEM PERFORMED LIVE FROM METHODIST UNIVERSITY
HOSPITAL IN MEMPHIS, TENNESSEE.
Broadcast June 14, 2004

NARRATOR

Annually more than 250,000 Americans undergo surgery to remove or repair herniated discs, a leading cause of back pain – traditionally this operation has proven to be painful and recovery time can last several weeks, however, Dr. Kevin T. Foley has founded a new technique for back surgery which provides nearly immediate release from pain – faster healing and less hospital time.

KEVIN T. FOLEY, M.D.

The procedure is called a METRX[®] Discectomy, it is a minimally invasive way to remove a ruptured disc from the low back and METRX[®] stands for minimal exposure tubular retractor.

NARRATOR

This new technology allows surgeons to repair herniated discs through a narrow tube inserted into a small incision in the patient's back. About 70-80% of patients who need herniated disc surgery are candidates for the METRX[®] procedure.

KEVIN T. FOLEY, M.D.

A typical patient who would be a candidate for this would have persistent leg pain from a ruptured disc or a bone spur – that had failed to improve with a good trial of non-operative care.

NARRATOR

You are about to see the METRX[®] System for a minimally invasive herniated disc repair in a live webcast from Methodist University Hospital in Memphis, Tennessee. During this presentation you can email your questions to the O.R. by clicking on the M.D direct access button below.

MAURICE M. SMITH, M.D.

Welcome to the live internet broadcast of a minimally invasive lumbar discectomy. We are at the University – Methodist University Hospital in Memphis, Tennessee – home of the Aerospace Institute. My name is Dr. Maurice Smith and my partner, Dr. Kevin Foley and I are going to demonstrate the use of the METRX[®] System to perform a minimally invasive lumbar discectomy to remove a herniated nucleus pulposus or a standard herniated disc which is compressing a nerve route in this patient. This

procedure is reserved for patients who have herniated discs which are compressing against the nerve routes and causing significant pain and neurologic deficits such as sensory loss or motor weakness and reflex changes which have failed other conventional, conservative approaches such as physical therapy, chiropractic care and anti-inflammatory medications. The standard treatment for this is a microdiscectomy but the microdiscectomy has significant morbidity associated with this. It causes damage to the muscle as you can see here in this post-operative MRI which shows the muscle damage after a standard microdiscectomy. The muscle is stripped off its attachments to the spine and is retracted for the case and this causes de-innervation and pain after the surgery. There have been numerous attempts to overcome this pain by doing minimally invasive surgeries but these surgeries really in the past have not only been minimally invasive but they've been minimally effective, in that they have not been able to reliably and routinely decompress the nerve route. The goal of lumbar disc surgery is to reliably and routinely decompress the affected nerve route. In other words, it's remove the bone and the disc which is compressing that nerve route in a reliable and routine fashion. The rationale for minimally invasive approach is to decrease the trauma to the patient and the patient's body that is necessary to get to that disc herniation. The problem becomes how do we become both of these techniques and what Dr. Foley and I set out to do over 10 years ago, was to develop a minimally invasive approach which would combine standard, open microsurgical techniques that we could use through a minimally invasive endoscopic approach with a tubular retractor. We chose a series of sequential dilators and a small thin tubular retractor as you can see here. And this has evolved over the years to having multiple different sizes to having tubular retractors, at multiple lengths and widths depending on the patient's body habitus and the exact surgery that we're going to do. So the tubes can be tailored to your specific body size. This technology is really used for out-patient lumbar discectomy. It can be done under general anesthesia or epidural anesthesia – it's done through a small incision and it does not strip the muscle off the spinous process but merely dilates it up from a paramedian incision off the mid-line in a sequential fashion.

We start about one finger breath off the mid-line – over the disc space, come down with a very small needle as you can see here – and then make a small incision about a centimeter and a half – then follow this with a series of sequential dilators, docking on the lamina, which is the bone that covers over the spinal column. And then placing a tubular retractor over the sequential dilators, removing the sequential dilators, establishing a small, operative corridor to the lamina and interlamina space which is right over the disc space. Thereby, allowing a minimal access to the disc herniation. We then remove a small amount of bone as you can see here – and the ligamentum flavum is retracted away – the nerve route is identified – and the disc herniation is then removed. Here you can see a large piece of disc that can be removed in this fashion – once the disc is removed and the nerve route is decompressed, the tubular retractor is removed and the muscle then comes back together and the skin is then closed in a standard fashion and you can see here just some steri-strips over the skin for a band aid.

Since its inception we have done hundreds of cases. If you look at our first hundred, consecutive patients with over a three-year follow-up, we have a standard demographic in

terms of males and females and age distribution – the average age was 43 years. All patients had significant leg pain, about half had motor weakness, and about 70% had significant sensory deficit. Postoperatively, 90% of the patients had total resolution of their leg pain and about 90% had resolution of their motor deficits and 80% resolution of their sensory deficits. Using a modified McNab criteria, that translated to 85% excellent results – 11% good results, 1 fair result and 3 poor results. In terms of outcome analysis, our mean hospital stay was 9.5 hours – our mean operative time the surgery takes was 75 minutes and our mean return to work – the average return to work over this series was about 3 weeks. Today, these numbers are significantly less. Our mean hospital stay is less than 6 hours, and our mean operative time is right around 60 minutes, our mean return to work, however, has remained about the same at about 3 weeks. The cost is significantly less than open surgery as you can see here – and our return to work is significantly better than open surgery because we don't have the larger incisions and the significant muscle damage that is associated with the larger surgeries.

The real difference is not how we take the disc out – but really how we get to that disc. In an open surgery, that muscle has to be stripped off the bone and retracted over the case, whereas in a standard METRx® tubular retractor surgery, the muscle is only dilated up from the center of the tube in a circumferential fashion about 8 millimeters. So there's minimal retraction to this muscle. Here's the type incision, after healing just about the width of your thumb.

In conclusion, out-patient, decompressive, cervical and lumbar surgery can be routinely and reliably done in a minimally invasive fashion. Outcome assessments have documented clinical utility, lower costs, earlier return to work and higher patient satisfaction. At this point, I'd like to go over to the X-ray and show you about the specific findings on the X-rays for this patient. This patient is a young man – a tree trimmer who has a four month history of significant right sided leg pain and sensory deficit. He has failed conservative care, his MRI shows a large disc herniation – you can see it here on the sagittal view – sticking into the canal, compressing the nerve route as it goes across this canal on the right side. ON the axial views, you can see it clearly here – this triangular shaped disc has come out and is pressing against the nerve route and causing significant pain. This is precisely the type of patient which does well from surgery. We have leg pain, we have neurologic deficit which has failed conservative care. Ideally, you would like to get better without surgery – but if you need surgery this is a nice way to do it because we avoid the significant muscle trauma that is associated with standard, open surgery. If we look at the lumbar model here, this is the disc herniation here, and it's pressing against the nerve route as it crosses. The surgery is performed here, over the lamina, come down, remove the ligament, retract the nerve route over and remove this portion of the disc, which is compressing against the nerve route.

At this point, we would, I would like to introduce you to the O.R. staff. First, I'll introduce you to Dr. Foley.

KEVIN T. FOLEY, M.D.

How do you do.

MAURICE M. SMITH, M.D.

And Dr. Maubasser, a Chief Resident in Neurosurgery. Shirley Clemmons, our scrub-tech, and Ron Conelly, our Nurse Anesthetist. And at this point, Kevin will take over the mic.

KEVIN T. FOLEY, M.D.

Well, good afternoon everyone. We're operating on this young gentleman, as Dr. Smith pointed out and he is lying in what's called a prone position – on his stomach with his back up towards us and this small tubular retractor that my finger is pointing to is the METRx® tube, which is in position and we are going to work down through this tube in between the muscle fibers as Dr. Smith explained to remove his ruptured disc. And I'd like Dr. Smith to show a segment as to how the tubular retractor was first inserted. Mau? All set? You say when. All set?

Ok – so after having made the incision, now we're going to dilate down through the paraspinus muscles. We start with a K-wire – and let's just place down through the fascia, now let's take the initial dilator and we will sequentially dilate over the K-wire down to the spine. Once that first dilator is in, we remove the K-wire and then we'll scrape a little bit with the dilator on the spine, let's get a picture there – fluoroscopic picture please – uh, huh. Now the next dilators. Now we'll sequentially open that pathway bluntly in between the muscle fibers. Next, please. Next, please. Mmm hmm. And then with this last dilator in place we will read off the side of this the length of our tubular retractor. And Sheryl, let me go ahead and have a five tubular retractor here. We're going to put a five centimeter length tubular retractor in here. Let me just get a picture there and take a peek at what we've got – fluoroscope – thank you. And now let's see that five centimeter length...here's the tubular retractor and we're going to place that over the final dilator and again right in between those muscle fibers, all the way down to the spine and then connect that to this articulated arm – so that we can hold this in place. Picture there, please? Alright – and let's go ahead and lock that. That's good. And now, the dilators will come out and we have established a pathway down to the spine that we're going to operate through. You guys can cut – can we get the operating microscope into the field, gang? We're ready. Someone get that pager, thank you.

MAURICE M. SMITH, M.D.

Now we will go back to Dr. Foley and he will show you how we actually handle the nerve routes and the disc through this small tube.

KEVIN T. FOLEY, M.D.

Alright – well, thanks, Mau. And you're looking down with me through the microscope – down through the small tubular retractor and remember that this is only about half an inch in diameter – and I'll orient you here – this is toward the middle line so that's towards the middle of the patient – this is towards the outside – this is towards the bottom – and that's up toward the patient's head. And what we see here – this is fat – normal fat that overlies the spinal sac that contains the nerve routes and that spinal fat can be seen

right here. We've done just a tiny bit of bone work here to make a little skylight down at the bottom of this tube. Remembering how Dr. Smith showed you how the tube was placed, so we're looking at the spinal sac there and this is the culprit nerve route right here – this structure is the S-1 nerve route and beneath this lies the herniated disc. In fact when I take this blunt probe and put it below it, I can feel the disc right under there. This is the disc that we are now going to remove. So, I'm going to ask my assistant Dr. Maubasser to retract that route, move it aside so that we can work on the disc herniation.

And Jean Pierre, if you can hold this just like that – alright – that right there – and adjust our scope ever so slightly – is our herniated disc which appears to be contained beneath a layer of what's called the annulus, and there's a small vein there I'd like to coagulate. Shirley, can I have the bi-polar? And so we need to divide that vein before we get down into the disc. This instrument I'm using is called a bi-polar and it applies just a tiny bit of current – as you can see it coagulates those veins. Alright – Shirley, may I see the micro-knife. Now we're going to make an incision in the part of the disc called the annulus, so that we can get to this disc herniation. And so that small knife is down here – I'm going to incise just enough of the annulus so that I can get to this disc herniation. Alright – hopefully that will be enough for us. Jean-Pierre, retract just a tiny bit more – good man. Make just a little bit larger opening there. Alright let me see the ball probe, please. Now we're going to try to tease the disc out of there. I'm reaching under the route – through that small opening – ah hah – you notice that disc material has the consistency of crab meat – that is fairly typical. When we're young, the discs, and by young I mean in our teens and early twenties – these discs are gelatinous and then as we move into our later twenties, in our thirties and forties, the discs become tougher stuff. Again, more like this crabmeat material. I'm trying to retrieve that fragment out and about here.

MAURICE M. SMITH, M.D.

And just reminder to our audience, please feel free to email us any questions as we're operating here and we'll be happy to answer them. I've received one question, uh, stating, "Is post-operative physical therapy indicated following this procedure for flexibility and stabilization activities and/or pain modalities?" This is an excellent question because I'm a firm believer in physical therapy and chiropractic rehabilitation before and after surgery – and one of the interesting things that both Dr. Foley and I have found is that these patients really require much less physical rehab – after this operation because they are not laid up as much after their surgery as you would in a standard open procedure – but we do try to do a lot of physical therapy and chiropractic care prior to surgery in hopes to try and avoid surgery.

You can see here that Kevin has the nerve route retracted medially – that's towards the mid-line so that he can safely and effectively get into the disc space here – that you're seeing – at the bottom of the field.

KEVIN T. FOLEY, M.D.

See if I can zoom this picture in for us, little bit.

MAURICE M. SMITH, M.D.

He's going to zoom the picture in which will increase our magnification and make it a little bigger. You can see the disc at the bottom of the field. Dr. Maubasser, can you release the nerve route just a little bit so I can show it to the audience. There's the nerve route by the sucker and retracting it medially – nerve route retractor goes in and you can appreciate that this is very tight right there because of the disc herniation – and that will get a lot freer once the disc is removed.

KEVIN T. FOLEY, M.D.

See the ball again? So, Mau, this is – it contains pre-ligamentous fragment that is stuck in there.

MAURICE M. SMITH, M.D.

Yeah – it looks very tight.

KEVIN T. FOLEY, M.D.

It is – it is tight.

MAURICE M. SMITH, M.D.

It's uh, something that we like to see as a surgeon because we know we're going to make him better once we get this disc out. We received another email question – asking whether this technique is appropriate for bulging discs and the answer is possibly. The problem is the terminology is really bad – whether you have a bulging disc or a herniated disc or a protruded disc or a extruded disc or a slip disc – it's all poor tech – terminology and the real proof of the pudding is the disc. Has the disc come out of it's place and is it compressing the nerve route causing radiculopathy. Radiculopathy is a fancy word which basically means that the disc is pressing against the nerve and it's causing motor changes, weakness, sensory changes, numbness or tingling or reflex changes and pain. That is the type of disc problem that we can make better with surgery if you have already failed conservative care.

KEVIN T. FOLEY, M.D.

Again, Mau, we're trying to tease this thing out – it is really stuck in there – but it will yield to us.

MAURICE M. SMITH, M.D.

We had – oh you can see a very nice disc fragment right there which was teased up with a small nerve route – he's about ready to remove a nice fragment –

KEVIN T. FOLEY, M.D.

You can see the nice fragment of this material coming out.

MAURICE M. SMITH, M.D.

Dr. Maubasser can now show you that nerve route is a lot freer.

KEVIN T. FOLEY, M.D.

You can show the audience the size of that – that’s going to make a big difference for this man’s nerve route. And that fragment was really stuck under there.

MAURICE M. SMITH, M.D.

You can see that fragment – that’s a nice fragment which has...

KEVIN T. FOLEY, M.D.

That is likely our culprit fragment but now we’re going to look for additional things under there. And

MAURICE M. SMITH, M.D.

That’s a nice hard piece of disc which is affecting that nerve route.

KEVIN T. FOLEY, M.D.

You look underneath now – do you have the picture in the tube?

MAURICE M. SMITH, M.D.

Not yet, it will be there –

KEVIN T. FOLEY, M.D.

Just want to show the difference. That was the fellow’s pathology – just didn’t want to come initially.

MAURICE M. SMITH, M.D.

There’s the nerve route at the bottom of the view.

KEVIN T. FOLEY, M.D.

What I want to show, Mau, is what we do at the end of the case is just to show how nice and loose this route is. The difference – in the mobility and the, frankly, the tension in the route. Like night and day – that’s now a normal route. So Mau, what we’ll do, can we have some irrigation, Shirley, that was our fragment and we want to now explore around and look for any additional fragments that are present and then I think we can show the audience the removal of the tube after that. What you might do, Mau, while we explore around is answer some more emails.

MAURICE M. SMITH, M.D.

Ok. Next question was, “If a patient was in good health, what is the average recovery from this surgery and how does that compare to open surgery.” Well, we’ve looked at that and the bottom line is our average return to work is about 3 weeks with this procedure and it’s about 6 weeks in an open procedure. The real difference has been in our experience is the postoperative pain is remarkably less with this procedure – we require less narcotic use and we have been able to mobilize patients quicker and therefore have gotten them back to work quicker.

KEVIN T. FOLEY, M.D.

Yeah – I'm going to explore just a little bit more here.

MAURICE M. SMITH, M.D.

One of the common findings we see is people complaining of low back pain. And having small disc bulges. This procedure in itself is not appropriate just for low back pain. Um, this procedure is a procedure to relieve the pressure on the nerve route – which is causing leg pain or a neurologic deficit in your leg. This is not a procedure for just back pain. We can also, instead of just taking out the disc, we can remove a significant amount of bone if we need to, to do stenosis. Stenosis is the narrowing of the spinal canal which then compresses the nerve routes and causes, can cause bi-lateral, both sides leg pain and deficit.

Another question is, “If you've had a cage procedure at L-5 and you now have an L-3 ruptured and extruded disc – are you a candidate for this procedure at L-3? And the answer is yes. They're – now that we have made multiple tubes at multiple sizes are indications for surgery have grown in that we can now re-do surgery through these tubes but sometimes they need to be larger because you need a little more exposure for these re-do surgeries which can be very difficult. But this question is asking that if he has a disc at another level can it be minimally invasively addressed and the answer is yes. At this point, what Dr. Foley is doing is just going in and not only – he's already removed a large free fragment disc which has compressed the nerve route – now he's removing the part of the disc which is contained in the disc space but still bulging against the canal. And going into the disc space to remove some of the loose fragments in the disc space to decrease our recurrence rate.

KEVIN T. FOLEY, M.D.

You see down in the picture here? There's the very, very small defect through the annulus that that big fragment had come. As you explained to the audience, what we are doing is just going in there and making sure that we haven't left anything behind – in other words is there another fragment in that inner space that wants to come – and the answer is no, we're really not finding anything of significance in there. And so, we're about to quit here.

MAURICE M. SMITH, M.D.

Another common question that always comes up is when we remove a disc, we're always asked, “Well, what do you put back in there? Can my body live without the disc?” Well, we're really only removing a small portion of the disc. We remove the part that's come out of, or herniated, away from it's normal intervertebral location and then we go in and remove the free fragments that are inside the disc space that are loose. So there's always a significant portion of the disc material that's left behind – but a lot of research and time and effort is clearly being done on how do we replace discs in the future. But for right now, we're just removing them for discectomies and as technology improves, if we have

an implant in the future, it certainly could be placed through a minimally invasive fashion as this.

You'll notice that there's very little blood loss here, this is a very minimally invasive procedure and can be performed as an outpatient and people go home the same day because there's very little trauma to the muscle or the spine or the nerve routes that are affected. And you can see here, he's just removing a little bit more disc.

KEVIN T. FOLEY, M.D.

This is just a little knuckle just underneath, there in the disc space – you can see some of that there.

MAURICE M. SMITH, M.D.

Right.

KEVIN T. FOLEY, M.D.

And we've cured him by removing – but we want to make sure is that he doesn't get an easy recurrence here. And so our mission is to make sure we don't leave anything behind. Still a little something there.

MAURICE M. SMITH, M.D.

We received another question – “Concerning what happens to the lamina – that's the bone over the spinal canal that we remove in this procedure – do we need to replace that with something or do structures get caught in there?” And the answer is we really remove a small portion of the lamina and we keep the spinal stability intact so that we do not have to replace that with anything at this time. And the body does fine without any – without the lamina – there are certain procedures done with final stenosis in which the entire lamina needs to be removed at multiple levels and these patients do fine with that.

What Dr. Foley is doing now is irrigating with saline – just to irrigate into the disc space, clean the wound up, look for any more free fragments and you have a nice picture of that nerve route – nice and free – after he's removed the disc herniation.

KEVIN T. FOLEY, M.D.

You can see the nerve route looks nice and healthy there, Mau. We've minimized the retraction so that the – and then again you can see as we take our ball and go under that route, how nice and loose it is there.

MAURICE M. SMITH, M.D.

That looks really nice.

KEVIN T. FOLEY, M.D.

All the way out to the frame and here – and all the way up to the shoulder of the route there – and again – our mission here, our goal is to leave this route unpinched just as we have. And yet minimally disturb the tissue and as Dr. Smith pointed out you'll notice that there is hardly any blood loss with this. Perhaps we lose a thimble full and we like to

leave as much of this epidural fat as possible – and these surrounding soft tissues so that we make a very, very small opening here for the gentleman who asked about the lamina, we probably removed a thickness of lamina about the extent of my ball tip probe here. In other words, this space was all potential space in between the lamina which allowed us to work in the interval – the normal interval between the lamina – between the bone and the route in order to sneak in and remove that disc. Some more irrigation please?

MAURICE M. SMITH, M.D.

We received another question asking, “Is there a downside to removing the disc completely?” To remove the disc completely, this needs to be done through a bilateral procedure, that would mean either coming in on one side as Dr. Foley has done here – and then coming in on the opposite side and then going back and forth and removing the entire disc. Or removing it completely from the front – going through the abdomen. When you completely remove the disc, the entire disc, that does create some problems post-operatively – the disc can collapse and you can have significant instability with that and oftentimes that may require a fusion to be performed at the same time. A fusion is when we place bone or instrumentation between the two vertebral bodies to allow the bone to grow together and become one piece of bone rather than have two pieces of bone there with the disc. We try and avoid removing the entire disc unless we are planning to do a fusion.

Dr. Foley is looking at the size of the disc at this point and irrigating, cleaning up –

KEVIN T. FOLEY, M.D.

Letting a normal fat tissue come back in there, Mau, and then we’re going to put a little bit of the steroid on this route, for any residual inflammation this gentleman has. Alright – so we completed the job – we’ve unpinched his route, we’ve explored it to show that we indeed accomplished what we set out to – and now, we’re going to remove this operative corridor – the same tubular retractor that Dr. Smith showed going in in the first place. So I’m going to demagnify, or un-zoom this picture a little bit. Because I want you to be able to see the paraspinus tissues as the small tube comes out.

MAURICE M. SMITH, M.D.

And as he removes this tube, the muscle comes back together.

KEVIN T. FOLEY, M.D.

What I want you all to see is – see those are nice, pink, healthy muscle fibers – and you’ll notice that the path we went in is just spontaneously closing – those are the muscle fibers again – just coming back together – and shortly we’ll see a layer called the fascia – again you can see that path simply disappearing.

MAURICE M. SMITH, M.D.

And again that’s the real difference...

KEVIN T. FOLEY, M.D.

There’s the fascia.

MAURICE M. SMITH, M.D.

...between this procedure and an open procedure.

KEVIN T. FOLEY, M.D.

And the tube is out. Alright?

MAURICE M. SMITH, M.D.

And we're left there with just a small skin incision.

KEVIN T. FOLEY, M.D.

Sponge, [Unintelligible]? Alright, Mau, I'm going to come join you for questions and Dr. Maubasser's going to close the small incision and we'll cut back to show the audience the incision.

MAURICE M. SMITH, M.D.

Ok – we have another question – “I was told I needed an anterior cervical discectomy and fusion. Can this technique be applied in my case?” The answer is it can be, but we don't recommend that for anterior cervical discectomies because really, the anterior cervical approach only goes through one very small muscle and then requires significant dissection moving important structures moving to the left and to the right coming right down on the disc space and it really is a procedure that does not hurt – it – there's minimal pain associated with the anterior cervical approach and therefore the benefits of working through the tube is not as great if we don't have a significant amount of muscle damage that we're trying to avoid.

Again, another question concerning removing the entire disc and “Won't the bones rub together?” Again, good question, but we don't remove the entire disc – we do get some shrinkage of the disc space height – but very rarely does it collapse all the way down from just doing a lumbar discectomy unless you are going in bi-laterally on both sides and removing major portions of the disc. Another question, “Does the retractor bruise the nerve route at all? And what if you have to do both sides?” Retractor, there's minimal nerve route retractor – you were very careful with the retractor to retract the nerve route only when you need to – to let off on the retractor when you're not down working through the tube – that's why we have the assistant there with the nerve route retractor or the surgeon himself can hold on to that retractor so that you try and minimize the retraction to that disc herniation. And in terms of bilateral discectomy, that certainly can be done through this in a minimally invasive fashion. You just do it on both sides. Another question, “Of the 100 patients in the study was the procedure performed equally between cervical, thoracic and lumbar region?” The answer is no, these were the first 100 in the lumbar area only. The cervical was a different study and this was just in the lumbar spine. Another question, “How long does the procedure take?” It takes about 60 minutes.

KEVIN T. FOLEY, M.D.

I have another question here. The message is, “I had the surgery and it was quite successful. I’m currently up to 90% of the pre-injury strength and flexibility with no residual pain, however I’m curious as to what the next recommended step would possibly be if the surgery had failed. Fusion of the bones?” Well, most of the time, this surgery will be successful as Dr. Smith has said, the success rate is in the 90’s. The reason it’s not 100% successful is because we are unpinching the nerve route – we are not building a new nerve route. What I mean by that is that if you had a herniated disc for a long time – that has not been relieved either with medicine or with surgery – there can be damage to the route so that even though the surgeon goes in and completely unpinches the route, there still are some residual symptoms. Most of the time, with early enough intervention, that won’t happen. Now, two other things can occur. There is a certain incidence of recurrence of disc herniation – that little spot that we showed you in the annulus will heal but it will always be very, slightly weaker than it was originally and the incidence of a recurrent herniation is about 5%, or about 5 patients in 100. And if a patient has a recurrent herniation, sometimes that has to be addressed surgically as well. In terms of the fusion, that only rarely needs to be done after a discectomy but there are patients who develop significant back pain after they’ve had discectomy especially if a lot of the disc has been removed. That’s one of the reasons why Dr. Smith and I just like to remove the herniated fragment and leave as much of the normal disc behind as possible. If that does happen, again, medical management, physical therapy, anti-inflammatories, sometimes chiropractic will make you better. When it does not, sometimes a fusion can prove necessary. The nice point about that is that we have the ability now to perform these fusions if they are necessary through these same tubular retractors so we can do a minimally invasive version of the fusion.

MAURICE M. SMITH, M.D.

There’s a question about that exact thing – the recurrence rate in one year. Dr. Foley just said 5% recurrence rate but in that first year, that 3 year follow-up we only had 2 recurrences in that 100 patients. So that would be about 2% over a 3 year period. And Dr. Foley and I cannot explain why the recurrence rate is less than open because essentially we’re doing the same procedure at the disk level that we would do in an open procedure but we suspect that over time we’ll find it’s about the same as an open procedure.

KEVIN T. FOLEY, M.D.

I have another question here. “Does a herniated disc that has been compressing the nerve route for two years cause permanent damage to the nerve route?” Well that gets back to what we were just talking about a moment ago. The answer is it can. The analogy I use for patients is to imagine someone is standing on your thumb with the heel of his or her shoe. They are compressing or pinching your thumb. Your thumb is a piece of soft tissue. If they get right off your thumb, your thumb will make a nice recovery. If they stand on your thumb for a year, you still want them off your thumb, you still want to get the pressure off, however once they get off your thumb, you notice that your thumb is black and blue and swollen and potentially there’s been some permanent damage. So we know that the longer nerve route compression occurs, the more likely you’ll be left with some residual symptoms. Still if you have persistent, nerve route-related symptoms that

haven't gotten better with medical or non-operative management, it's still wise to have the pressure taken of that route.

MAURICE M. SMITH, M.D.

Another question, "Would conservative care be recommended or contraindicated after surgery?" And the answer is we do a lot of spinal rehabilitation with exercises after surgery. It does not necessarily require physical therapy but in some cases it is helpful.

KEVIN T. FOLEY, M.D.

Here's another interesting question which says, "Hi Dr. Foley – why is the protruding tissue removed versus being pushed back into the disc and the annulus re-sealed?" Well, that disc that has herniated has lost its supply of nutrients and has is now a dead piece of tissue so we don't like to put dead tissue back into the body – the likelihood is that it would simply herniate out again or cause some kind of inflammatory or swelling type of reaction. Doctors, surgeons, over the decades have looked for various ways to repair that little hole that I showed you in the annulus, the defect, and it turns out that the different ways to try to repair it artificially do not work as well as leaving Mother Nature to her own course. In other words, if we let that annular defect heal on its own, patients just tend to do better than if we get in there and try to sew it or try to glue it or try to patch it in some fashion.

MAURICE M. SMITH, M.D.

If we don't get to all of your questions during this webcast, we'll be sure to email you the responses later after the show. But let's go right now to the incision and take a look at the size of the incision. Dr. Maubasser, can you show that? Ok – you can see that incision is about the size of his thumb. About two centimeters long and he's going to put some steri-strips on that to hold it together and then a band-aid. That's just some sticky material there that allows the tape to stick and he'll put a little dressing on that.

KEVIN T. FOLEY, M.D.

Now, what we'll typically do is, of course, the patient will be awakened and go to the recovery room and after the patient has recovered from the anesthetic which takes between an hour or two – the patient will get up and start to move about. Once he can ambulate, we will discharge him from the hospital. And so, he will be able to go home and spend the evening in his own bed rather than having to spend the evening here in the hospital.

MAURICE M. SMITH, M.D.

Here's another question, "After the diagnosis of a herniated disc, should the patient undergo surgery and within how long – weeks or months?" The diagnosis of a herniated disc does not mean that surgery is necessary. Surgery is only indicated when conservative care has failed to relieve the symptoms from the herniated disc. Those symptoms as we've gone over in the past, are the leg weakness, the leg sensory findings, numbness, tingling and pain down the leg. If these cannot get better with physical

therapy, chiropractic care, nerve blocks and anti-inflammatory medications, and your MRI shows you have a disc herniation impinging the nerve route then surgery will be very helpful for this type of patient.

KEVIN T. FOLEY, M.D.

Another question here, “Does the nerve normally return to ‘normal’ following the surgery?” And the answer to that is that typically that is true. Remember the statistics that Dr. Smith showed you on the slides. About 95% of these nerves will normalize – there is a small group of patients who will have some persistent symptoms – some persistent numbness, some persistent tingling or weakness – not because of the surgery itself but because the nerve has been compressed long enough that there’s been a tiny bit of damage to it. Still, when you take the pressure off the nerve routes, they most typically recover.

MAURICE M. SMITH, M.D.

Here’s another question, “Is this surgery useful for inserting a bone graft between the two vertebra?” And the answer is yes, but it’s a little different surgery than we just showed you here. It is a much more in-depth procedure in which the entire disc would be removed in a bilateral fashion or in a unilateral fashion and then the bone graft is placed into the disc space and instrumentation with screws or rods are used to hold that in place – this would be done through a slightly larger tube but it is certainly do-able through a minimally invasive approach.

KEVIN T. FOLEY, M.D.

I believe we’re ready to show a short video clip – a testimonial of a patient who underwent this very procedure. This is a gentleman who is another healthcare professional and so please watch the clip and listen carefully.

VIDEO

DR. ALAN JAMES, CHIROPRACTER

As you know, I’m a chiropractor and we do of bending and twisting and moving patients around and because of what we do we tend to develop some back problems. Now, mine finally manifested when I was playing hockey. A guy cross-checked me from behind and the disc ruptured – I didn't know it ruptured at the time, I was in severe pain and I went down on the floor. I went through a period of I’d say the next six months – I got adjustments which did not really help a lot. I did physical therapy – that did not help a lot – I did injections, I did some different medrol dose packs, and different things like that trying to resolve it on my own believing that it couldn’t be ruptured cause it’s my back – I can’t have a ruptured disc. But finally, when I had an MRI done that I ordered myself, and it was kind of funny because the radiologist and I were both looking at the film and it was like, “Oh my gosh, you got a massive rupture.” “Ok.” I had heard about Dr. Foley – I had been sending patients to him intermittently over the years and had heard about the surgical procedure that he was doing with the decompression and so that was the guy I wanted to call and there was no doubt that was who we were going to call – and go from there. Dr. Foley and I got together and discussed the possibility and the need for some

surgical intervention – he performed the procedure. Because of the procedure being so non-invasive, he didn't have to cut any muscle tissue, he didn't have to cut any bone, my recovery was so quick – I was back at work the following week. And I was moving very carefully, obviously, but because he didn't have to cut any major structures, I was able to do that. Within two weeks, I was on a full rehab program, within a month I was playing hockey again. I owe a lot to Dr. Foley. If I have a case that is a patient of mine and my patients will tell you, if you have a disc that I can confirm by X-ray, not by X-ray – by MRI, that I can confirm, you're going to see Foley – it's that simple.

KEVIN T. FOLEY, M.D.

Well, that completes our program for today – we hope you found this both interesting and informative and we thank you for tuning in if you will on the web. We invite you to email us with additional questions and Dr. Smith will attend to these and respond to you over the internet. Thanks once again.

NARRATOR

This is been a Minimally invasive disc repair using the METRx® System performed live from Methodist University Hospital in Memphis, Tennessee. For more information, to make a referral or make an appointment, click on the buttons below.