

XLIF PROCEDURE: MINIMALLY DISRUPTIVE PROCEDURE FOR SPINE
SURGERY
TAMPA GENERAL HOSPITAL
TAMPA, FL
May 14, 2008

00:00:09

ANNOUNCER: Welcome to Tampa General Hospital in Tampa, Florida. You're just a few moments away from seeing a live minimally-disruptive procedure for spine surgery called XLIF, extreme lateral interbody fusion. Dr. Juan Uribe will perform the procedure. Dr. Uribe is the assistant professor of neurosurgery at the University of South Florida College of Medicine. He will be joined by Dr. Fernando Vale, vice chief of the Neurosciences Department at Tampa General Hospital. Dr. Vale will provide commentary and answer viewers' e-mail questions throughout the event. The minimally invasive XLIF procedure takes a unique approach with a side entry. This allows the surgeon to achieve complete disc removal and implant insertion. The procedure also takes less time to perform than the traditional open surgery, and patient recovery is noticeably quicker and easier. 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 join the doctors.

00:01:17

FERNANDO VALE, MD: Welcome, everybody. We are live in Tampa General Hospital in Tampa, Florida, Room 18. Today I'd like to present one of my colleagues, chief of the spine section at the University of South Florida in Tampa, Florida. My name is Fernando Vale, I will be the narrator of this procedure. I would like to present Dr. Juan Uribe, assistant professor at the University of South Florida, Department of Neurosurgery, acting chief of the spine section. Dr. Juan Uribe, would you like to say welcome?

00:01:55

JUAN URIBE, MD: Yes, certainly. We are almost ready to start with the procedure. My staff, I have Dr. Nichols on my right. He's the chief resident. And my staff, my scrub techs, and the x-ray techs, and everybody's ready to go. So first I started with a skin incision. This is in the side of the patient, approximately 4 centimeters. And then I dilated with sequential tubings down into the psoas muscle. And now we're going to stimulate in order to map the nerves on the lumbar plexus. And with the NeuroVision monitoring on the screen, we are obtaining the numbers that tell me how far I am from the nerves. Generally, numbers 20 or more -- 20 or more are good numbers. Yellow numbers are close to the nerves. And as we can see, I'm rotating my instrument and as I rotate it, numbers are changing. Now we can see on the monitoring, you have 9, so it's telling me that I'm close to the nerves but not too close to injure them. So now I can have a mapping where the nerves are. Now back to you, Dr. Vale.

00:03:50

FERNANDO VALE, MD: Okay. Well, let me go back a little bit in time. What we're doing today is a procedure known as XLIF. A better term would be extreme lateral

interbody fusion. This is a procedure that has been performed for quite a few years, and it's used for patients with severe intractable lumbar spondylosis. Anybody that suffers from spine disease from L4 and above could potentially benefit from this operation. It's minimal access. Some people call it minimally invasive. The idea is to minimize pain and allow for a faster recovery.

Before we go into the details of the procedure, I would like to show you a quick video of the positioning of the patient that will allow you to understand how this operation is done. If you look at the monitor-- at the video right now, this is Dr. Juan Uribe at the initiation of this operation. He is basically placing the patient on a lateral decubitus position, that means right side is down, and he's using the C-arm, that is fluoroscopy, to identify the level. In this way, he can mark the skin incision prior to the start of the operation. And as you can see, they are tiny marks. It's really small incisions that allow access to the spine -- to the problem in the spine. And you can see right here a quick shot of our radiograph of the potential disease that can be corrected with this minimal access approach to the lumbar spine. So that's the way that we position patients for this operation, it's on the side. And that way we try to minimize muscle destruction. We go from the side, split the muscle apart, and get access to the spine. That's the idea behind this. This is what we call our transpsoas approach. Basically we have the flank on the side, we split the skin and the fascia and get down to the psoas muscle that is a large muscle that helps stabilize the spine. From there, we just get access to the disk space and perform the fusion. And that's all done through sequential steps. The first step is placing of the guide wire, which uses a monitor. That monitor allows us to record nerve function. And after that's placed, then we place-- after that's done, we go to retractors, and Dr. Juan Uribe's going to show the placement of the retractors at this stage.

00:06:40

JUAN URIBE, MD: Okay, so this is the MaXcess retractor. Basically it's a tool, a retractor, and once we dilate it with the tools now, we're going along them inside the wound until we get in contact with the spine. Now we're going to take a quick shot on the x-rays to make sure that I'm in a good position. And on the screen, we can see the retractor is in a good position. X-ray again. Picture. Okay, once we get this position, now we're going to lock the retractor to the arm. Dr. Nichols. And the tube has numbers that is telling me how deep is the spine from here. So we set the size of the retractor based on that. So now once we get -- secure the retractor, I can remove my hands. And again, a quick shot. We're in a good position. Now we proceed to open the retractor. Very slow, because what we're doing is dilating the muscles, we're not cutting the muscles. We're just clearing the muscle fibers. So we leave some time for the muscles to relax. And then back to you, Dr. Vale, while I keep working on this area of the procedure.

00:08:32:

FERNANDO VALE, MD: Okay, well, basically this is retroperitoneal approach, and I would like to show you some of the instruments that we use so that you understand the idea behind this. It's through a side, get access down to the muscle of the spine, and to be on the safe side, because there is potential for nerve in that location and there is always the potential for nerve damage, the assistants have a way to monitor nerve functions. It's called NeuroVision, and it's basically a simple device that I'm going to show it to you that is used for two reasons: as a dilator and as a nerve recording. This is the way that you get access to the spine and at the same time stimulate to identify the location of the nerve. So when you place the retractor and you perform the discectomies, you minimize damage to the nerve. This is the initial step on the operation. And as you can see here, the attachment to that guide that allowed electrical stimulation to identify the nerve. And this monitor can be turned around so you safely identify the location of the nerve. This is an important step, and

this is the key to prevent any potential problem with this operation. After that -- after that's done, then basically these dilators are placed in a sequential manner, and then the retractors are placed to allow exposure to the disc space. This patient is suffering from severe lumbar spondylosis. That means damage to the disc space, damage to the facets, to the ligaments, there is narrowing of the spine. This is causing back pain, severe leg pain. So the idea behind this is to open up that space, decompress the nerve, and replace that disc. And that's what Dr. Juan Uribe is doing at this point in time. I would like, if we have time, to show an animation so people can understand how this procedure is done from a cartoon point of view. And as you can see right here on the screen, this is the initial steps when the patient is placed on the side. We're marking the skin incision with that X, we're using radiograph to identify the level, we're looking here at our shot from the side of the spine, and we can see the muscle and the lumbar spine with the nerve. That's the large muscle that we call the psoas. This muscle is really important for us to work around, and we have to go through that muscle to get access to the spine. That little tube that you're seeing there is the guide. That's the initial step to identify the space. That's the initial step to identify the nerve. And that's the initial step to get access to the retroperitoneum. Following this, all the different dilators are placed and a retractor is placed deep inside in the wound to allow visualization of the disc space. As you can see, that dilator is spreading the muscle fibers apart. We're not cutting any muscle fiber, we're spreading them apart, and that's how you get access to the disc space. You perform a discectomy. That's basically a removal of a disc, and you place a device that serves as a fusion substrate at that spine level. This is what we call a cage. And that's where the term comes from: extreme lateral interbody fusion. It's a spine fusion without cutting much of muscle, minimizing the trauma to the soft tissue. And these are different shots, again, of the muscle and the animation. This is just -- you can see the machine there that allow us to get an x-ray to identify the level, because this is done through a little, small opening. So the x-ray is extremely important for localize the level. And again, we can see the cage right here, placement of the cage at that level. I would like to take a moment to show you the cage. You briefly saw it in that cartoon animation, this is how the cage looks like. As you can see, it's made of PEEK, that is a plastic material and has openings that allow for placement of bone inside to allow for the bone fusion. This is -- this is what is placed during this operation through this minimal access approach. You're fusing the spine with minimal trauma to the soft tissue, and that way the patient can recover faster, they can get up and around faster, get them home faster. That's the idea of this approach: minimize the trauma to the soft tissue. I also have here a little spine model that I'd like to show to everybody. This is a side view of the spine right here. This is the front of the spine. This is the back of the spine. And we can see the disc space. In this case, we have a plate placed from the lateral approach plus the cage placed to fuse the spine. And this is right looking through the front. As you can see, there is no incision from the front, it's all done through the side. We do not cut muscles on the back, and that way you minimize the possibility of pain. This is how it should look at the end of the operation. Okay? These are little things that you need to know to perform this operation. Of course, everything requires a learning curve. This is something that is done many times, and as you practice and you do this surgery more, you become more efficient. I would like, if we have time, to show the x-rays of this patient so you understand why are the indications from this operation. And if we have some time, show a quick plain x-ray of the lumbar spine. So if we have a -- whenever we have a chance, we can go back to it. In the meantime, Dr. Juan Uribe is still working in the spine, he's still identifying the level, placing the retractors, working in the exposure of that spine that is so critical. And you can see there is a quick view of the x-ray there, and which is used by Dr. Uribe to identify

the spine level. Important things to know about this operation. Number one, this operation is for a specific level of the spine, only can be done from L5 and above. It cannot be done at L5, lumbar five, and sacrum 1. This is what we call the L5-S1 level. These are difficult levels to approach from the lateral approach. It works really well at L4/5, L3/4, L2/3, and above. Again, patients that suffer from severe back pain, leg pain, stenosis, spondylosis, they can potentially benefit from this surgical intervention. The idea is to remove the disc and place that cage so we can open up that disc space, give more space to the nerve, and allow for a fusion without disrupting the rest of the soft tissue. You can see Dr. Juan Uribe is trying to insert the endosco-- what looks like an endoscope there to get a better picture, you can get a close-up of the area that he's working at it, we're working on it. I mean, this is a small opening, and unfortunately, our cameras don't have -- we cannot get them deep enough to look at the disc space, but he will use an endoscope to get a closer view of the disc space at L4/5, which is the side -- the level that he's operating at this stage. And you can see right there is the endoscope, and you can see the monitor placed, and now we're getting closer now. It is through that small opening, and that's the key about this operation. A small opening, less pain. And through that small opening, he is inserting that endoscope so we can get a picture of the disc space. Well, Dr. Juan Uribe, did you want to describe the view?

00:18:17

JUAN URIBE, MD: Yeah, so now I have the retractor in good position, as we can see in an x-ray. Please take an x-ray. So on the x-ray, you can see that the retractor is in a good position. Show him where the x-ray is.

00:18:39

FERNANDO VALE, MD: So we like to see the fluoroscopy, the x-ray that shows the retractor.

00:18:45

JUAN URIBE, MD: So now --

FERNANDO VALE, MD: We're going to look at that retractor, at the view right now. Okay, Dr. Uribe, you are on.

00:18:54

JUAN URIBE, MD: Okay, now we're going to try to give you a view through the retractor inside the patient all the way down into the muscles, and we're going to be in front of the disc, so this is the retractor. We're going down, down, down. As long as we're going down, this tissue is fat around the retroperitoneum, where the bowels are. There's our retractor. And now deep in here, as you can see, that's where the disc is. And right now, I know that I am in the disc space on the x-ray guidance and also the whitish color that we see there means that that's the annulus, where the disc should be. Now my next step, I'm going to excise the disc and remove it. But first I'm going to stimulate again with the NeuroVision, make sure that I don't have any nerves that I can injure doing my cut. So one more time, stimulating inside. And I check the numbers that I have on the screen. Now, we can see numbers are on the green side, so I'm safe to make my cut. Knife, please. Now with the scalpel, I'm going inside, down the retractor to the -- camera with the endoscope. That is going to show -- so I have the knife and I'm going to cut anteriorly. See how soft is the disc? One cut, then another cut above. Two cuts, then I make a box cutter, box shape. You can see, it's very soft, because I'm in the disc. Above here and below is the disc. So now I'm going to start removing the disc. Okay, down to the instrument, we're into the disc space, getting the disc fragments from there, which we can see. Cup. Give me my knife again. I'm going to increase a little bit more the opening. And cup. Now I'm going inside the disc space, I'm going to lose all the fragments. X-ray. X-ray. Right there. So now we can see on the x-rays how the retractor is getting inside the space. We lose the AP picture for some reason. The AP is not -- okay.

Yeah. Okay, picture. We're going down into the disc space. You can see to the other side. Once we drop the annulus -- right now, picture. Again, extract all the way to the other side. Picture. So now we see that I'm through the other side. Now I scrape, lose all the generated osteophytes and bone growth that the patient has before. Picture. Now we can see how we are expanding the space. Mallet. Now we're going -- this is a box cutter. Picture. I'm going to scrape. Picture. Now keep cleaning the space. Picture. Picture. All the way to the other side, and then I rotate the instrument, and then we're going to grab more disc space. Pituitary. Now we've got more disc space, more disc material. And sequentially, we are removing the disc until we clean and remove the disc as much as we can in order to prepare the space for placing the graft, the cage, and initiate the fusion. We go one size up. Picture. Picture. Picture. Picture. Same maneuver. We rotate, then we can see more disc is coming from the retractor. Now we're going to take more loose pieces of the disc. So the opening that I have on the working channel is approximately two centimeters by one and a half centimeters that you can see, so we were to use more channel, but everything that we do is just to minimize the postoperative pain and the muscle injury that is in the short term the biggest cause of pain during the postoperative period. Suction. Okay, now back to you, Dr. Vale, while I keep cleaning the disc space.

00:26:32

FERNANDO VALE, MD: Okay, well the few things that I would like to readdress, number one, it's extremely important that we have good fluoroscopy. I mean, good x-rays. We need to make sure that we've got a great view of the spine. If you don't have a good view of the spine, it's extremely difficult to perform this operation. And number two, to continue to monitor the nerve. This area, there are many nerves that we have to make sure doesn't get in our way. These nerves are constantly being monitored through the NeuroVision that Dr. Uribe showed previously. We have some questions that I would like to answer at this stage. And number one, the first question says like this: can this procedure be performed if I had failed back surgery? Absolutely. As a matter of fact, that's one of the main indications from this operation. That's something that has to be discussed between the patient and the surgeon to see if you're a potential candidate. Second question: can this procedure be performed at cervical spine area? Well, the neck, no, unfortunately not. We're not there yet. This is mainly the lumbar spine, low back area. We have -- it can be done in the thoracic spine, but we are not there to the neck. Another question is: can the implant stay forever? Yes, absolutely. Once it's placed, we hope that it stays there, because that will serve as a fusion substrate, which allows that spine to be stable. Another question is: can it be rejected? Well, we've never seen it. This cage that you've seen before is made of PEEK, that is plastic, but is real strong plastic, has been tested for many years. We have -- as far as I know, I've never heard a case about rejection from a device like this. It's well-incorporated in the body, especially in the spine. More questions: can it be done at age 70 and older? Absolutely. It's all about bone quality. It's not about age. If you have good bone quality, you can potentially be a candidate for this surgery. Another question: can we implant more than one at a time during surgery? Absolutely. Dr. Uribe and many other surgeons have corrected spine deformities by inserting many of these devices at the same time. It could be done from L5 up in the lumbar spine. One more question: are there anything that a patient would not be able to do after surgery? Well, hopefully not. The idea of this surgery is to get you back in shape so you can golf, you can swim, you can run, and maybe even skydive. It all depends. Everybody's different. I mean, of course, you have to learn to take care of your spine. I want to clarify a point. Before you heard a lot of hammering and you saw Dr. Uribe using a hammer and a mallet. Well, the spine is hard bone. And we have to use these instruments to be

able to perform the surgery. We're not hurting anybody. This is the way that it works in the spine. You have to get access there, you've got to work against bone, which is extremely hard. So it's normal for us to hammer to get access to the problem. What he's doing at this stage is basically a discectomy. The disc is that spongy material between the bones, and as we get older, our disc faces degenerate. That means they collapse, they get bone spurs, you suffer from severe facet disease. These are all stages of arthritis. And it will happen to anybody. It will happen to me, it will happen to you. It's an age-related change. But what we try to do is basically try to restore that normal height, try to restore that normal anatomy, and that way open up the nerve, open up the space, and give it more freedom for those nerves to work better. Dr. Uribe -- again you see the hammering in the background -- he's just basically using that device to clear the space. He wants to clear the space so we can insert that cage that will serve as fusion. And he is going from one side of the spine to the other side of the spine, and that's critical, because you want support. You want to achieve support of the spine. So you have to go from one side to the other to remove the disc space and get access to the problem. And again, he's using that device as basically one of those shavers. We shave the disc space, we clean the area so we have bone-to-bone contact on the cage in between to allow that anatomy to be restored again. And these are all fancy instruments, but at the end it's like fancy carpentry. It's a lot of hard work, and what you're trying to do is to restore the normal anatomy of the spine. Just remember, if you have any questions out there, please get it to us. I'll try to answer while we can. Right now he is in that critical stage of the operation that it requires his full attention. As soon as we can get Dr. Uribe's attention, we'll let him describe the procedure. In the meantime, everything's going perfect as planned. We believe that this hopefully will help this gentleman to recover from his spine disease. Again, as you can see before, this is done through a real small incision, and that's another critical part. But to make it through a small incision, you have to have good access. You have to know where you're going. So that's the idea: minimizing the incision, minimizing the soft tissue damage, faster recovery, better results. And that's where we're working. As you can see, this operation, because it's done through a little small incision, there is the potential for minimal, minimal blood loss, which many patients do care. And most of the people could potentially go home within one or two days after surgery. As a matter of fact, we like to get them up and around within 24 hours. Of course, I mean, you're going to have a little bit of discomfort, you may have a little bit of pain, but that shouldn't be a limiting factor, as we believe that as the recovery phase moves along, you'll feel much better. Again, you see Dr. Uribe working in the retractor there, just slowly opening the space so he can get a better view. And so he can see the disc space before he gets to the process of inserting the cage. And I would like to remind Dr. Uribe, when he's done with the discectomy, maybe he can give me a view with the endoscope so people can understand what we're talking about. In the meantime, I have another question here: how this procedure compares to an open operation? Well, they're all open. We make openings. To get access to the spine, you have to make an opening. What we do is minimize the opening. So for me, I like to call this minimal access. We minimize the opening, minimize the pain, minimize the blood loss, minimize the recovery period. But it's still an open operation. Now what people tend to refer to an open operation, it means that they usually make -- place a long skin incision in the back of the spine, they split the muscle apart, it tends to hurt a lot, take some bone out, and then perform the discectomy and place a lot of screws from behind. Well, it's complicated. And both surgeries are complicated, but unfortunately, the open approach, because of that soft tissue damage, can potentially bring more pain and prolong the recovery phase. So they're both successful and there is still many indications for an open approach. I'm not saying

that everybody will benefit from this type of surgery. There is a role for the open operation and there seems to be another role for the minimal access operation like this. Now, as we learn more, we tend to do more of these types of operation, because we can see that it can benefit many patients without causing any major morbidity. And that's the idea behind this. We want people up and around, recover faster. So Dr. Uribe's still working on the discectomy. There are another few things that I'd like to say about this operation. The monitor that we use is -- is extremely easy, and that monitor, I don't need extra help to use it. We've got numbers, and based on numbers, we know the proximity to the nerve, which helps everybody get access to that area of the spine. I believe that Dr. Uribe's going to get real close for us to take a quick look in the depths of the wound. He's still working, as you can see. He's putting his instrument --

00:37:03

JUAN URIBE, MD: So now we are taking the last part of the disc out, that you can see is a big piece of disc. And then I'm going to suction and see if we can show you a very picture of the disc space. So now that muscle that needs space -- cleanup of one more piece in here. Give me the pituitary. In a second, I will try to show you how clean it's going to be, the entire. Just one more piece you can see. And now the entire disc is practically clean. See, we can put the endoscope through that, so see the black area there at the end, that's where the disc was. So actually, Dr. Nichol is trying to get inside the disc space. This is actually inside. You go outside a little bit? Now we need to clean the camera. Now we can see that the disc -- and we are inside the disc space. So we are going to place our cage there. So now I'm going to do the final tuning on the end plates to make sure that they're going to receive the cage properly and the bone is going to go through the cage. And we're going to put an implant. Now this is the template that they're going to show me. This is the good size that we can fill the space. Picture, please. Picture. Picture. Now, as we can see, I've already crossed, and this is the space that we need to fill up with the cage. Can we take a picture on the other view, make sure that we're okay in both planes? Because we need to be in the middle of the disc space so we take advantage on the entire surface in order to obtain a good fusion. So as we can see on the x-ray, we are occupying the entire disc with the template that we're going to use on the graft. Okay. So now we're going to proceed with the placement of the cage. Go back to the other picture and back to Dr. Vale.

00:40:35

FERNANDO VALE, MD: Okay, as you can see, a few things that I wanted to know, number one, when you saw those views from the endoscope, there was minimal blood loss. You could see that the discs have been removed, the disc material is soft -- feel like shrimp, some people say -- but when it gets degenerated, that can cause a lot of collapse in that area, it can cause a lot of pain and suffering, and that's the idea. So if you remove that disc space, so that allows you to restore the normal height. Again, this is the model that I showed before, and you have to understand how this is done from the side, and that's where that cage is placed. And we remove the disc space to basically allow the placement of the cage, which will serve as fusion. Because this is a lumbar spine fusion done through a minimal lateral access approach. And as you can see, that's the cage, which is packed with bone inside and that allows bone-to-bone fusion without disturbing the rest of the lumbar anatomy. Again, I mean, as you saw, it was minimal blood loss, which is a plus for all these operations. When we compare this with an open procedure, what we call a standard open procedure, it is always a potential for blood loss. We have to dissect more muscle, we have to remove a lot more bone, so that can cause problems. And that's the idea behind minimizing potential problems through a little small opening, get down to the disc space, fuse the spine without causing tissue destruction. And that's

what he's working on right now. He's preparing that disc space, preparing the disc space so he can insert that cage. And again, I've got a view of the cage right here. This is basically the cage that is going to go into the spine. You can see this offers a lot of surface area, so when you insert that, it could be an extra support through the spine and allow for an adequate spine fusion. I have a few more questions that I want to discuss before I get deeper into this operation. Number one, there was a question here: does insurance companies approve this kind of operation? Well, yes. This is not experimental. This has been done for many years, and it's considered a lumbar -- it's considered a standard lumbar spine fusion. The difference is the approach, it's not the intention. We're still fusing the spine, we're just minimizing the soft tissue damage. There is another question here that says: does this procedure differ from a disc fusion? Well, this is a disc fusion. This is basically what we're doing. Some people do what was called PLIF, that is a posterior lumbar interbody fusion, you do it from behind the spine. Some people do what is called TLIF, that is foraminal lumbar interbody fusion. And then there is the XLIF, that is extreme lateral interbody fusion, and that's basically defining the approach from the side. We'll go back to the little spine that I had before, that you can see this is what is really allowing for the fusion. This is the disc removal. In this little lumbar spine, this represents the disc space, which is going to be removed. That's what Dr. Juan Uribe was doing. And then we basically place this cage that is replacing the disc. This is your replacement. Now, this is going to fuse. This is considered a lumbar fusion. Sometimes if the access is adequate, we can even place a plate and screws from the lateral approach. That also will give extra support to that spine to allow for a higher fusion rate. And sometimes we cannot do this, so we have to put screws from behind, so what this offers is more alternative to a patient that is suffering from severe lumbar spondylosis. Again, spondylosis means arthritis, which results in pain, nerve damage, and all of the above. So again, he's still working on the discectomy. As soon as Dr. Uribe is ready to place the cage, we'll go back to him so he can show how to place that. But this is really self-explanatory from the point of view of placing the device. And again, this device is designed to stay. Once you place it, you're going to try not to remove it, because he should allow for bone fusion in both gaps, those little spaces. Okay, so the question is, indications. I mean, what are the indications from this spine surgery? Well, you know, anybody -- anybody that is suffering from severe back, leg pain, nerve problems could potentially benefit from this. Again, this is something that you have to discuss with your surgeon, you have to discuss with your -- maybe primary care. As long as you have good bone quality, if you have a problem in the spine, you can potentially benefit from this operation. And again, it's minimally invasive, or what I prefer to term minimal access. We minimize the opening, minimize the blood loss, minimize the recovery phase. And it's something that that doesn't take that much; we've been working here for about 45 minutes and he's almost done with the discectomy. In the past, we used to do this big operation that it would take three, four hours, depending on how many levels, how much problem we encountered during surgery. This, we try to make it a lot simpler, and that's the idea behind it. So he's still working on the discectomy, he's still working through a little, small opening that is so small that I don't see anything from my point of view. I have to depend on the endoscope to be able to see the disc space. As you can see, there is silence in the room because everything is moving so smooth and there is no potential for much of a problem. Heart rate is doing okay, blood loss is minimal, and it's just extremely happy with this surgical intervention, as everything is moving the way that it should be. And again, he's still cleaning that space. He's positioning those retractors to make sure that he can get the best placement for that cage, because that's critical. You want to make sure that you place that cage right in the middle of the disc space to allow for adequate fusion. And

he's just double-checking. Quality control. The more that you check, the better you do a job, and that's basically the idea. And that's why you use fluoroscopy, that's why you have this many assistants, to make our life a lot easier in surgery. And again, he's looking -- he's placing -- if you can get a shot of the fluoroscopy there, so I know that we're looking at the hammering, but I'd like to look better at this fluoroscopy, at the view of the x-ray that showed the cage going in right there. Hopefully, can somebody give me a shot on the x-ray, of the x-ray there? There it is, we've got a view of the x-ray. Excellent. Now you can see -- look at this part, this is really important. I would like to keep the x-ray -- the shot on the x-ray right here. This is the front of the spine, you see these little bars, these represent the cage, and you can see this bar right in the middle. That is where you want it, and well aligned with the midline of the spine.

00:49:41

JUAN URIBE, MD: So now the three marks are the cage, as Dr. Vale mentioned. And now what we're going to do is make sure that in the other views, looks good, while Dr. Vale continues with the questions, these other questions on the web for him.

00:49:58

FERNANDO VALE, MD: Okay, well, as you can see, he's done so simple. He basically was able to put that cage in there and replace that disc and align those bars. Those bars are critical. And again, I'm going to go back to the device itself. This is the cage, and there is like a -- it's kind of hard to see, but there are some little bars in there -- let's see if we can get a close-up. We're getting closer, we're getting closer. Number one, this allows the cage to engage with the endplate and at the same time allows us to see it in the radiograph, so we know that we're placing the device in the right spot. It is those little spines if you want to see it there. It's kind of hard to see, but these are little metal bars there that allow to engage the endplate and tell us the placement of the cage. The reason that we need that is because it's hard to see otherwise. This is plastic, and the x-ray machine will beam through it, so you won't be see -- we won't see it unless we have these metallic bars. Okay, I believe that Dr. Uribe wants to say something at this stage.

00:51:11

JUAN URIBE, MD: Yes. So now we have the two views on the AP and lateral view that show that the cage is in the -- from one side to the vertebra to the other one, and on the lateral view -- can I have another picture, please? So we can see the marks of the cage that we have in the middle of this, the interior part of the vertebrae. Within the middle of the vertebra with the cage. When we remove the retractor later on, it's going to look much better, the image. So now in the meantime I'm going to keep going. And then we're going to implant the plate and the screws. And on the table is the cage. Dr. Vale can discuss how the cage looks and the implants on there.

00:52:01

FERNANDO VALE, MD: Okay, well, basic-- we can go back to, again, this is the cage. And this is what he just placed in there. Again, you see the gaps, these gaps have a reason they are there. These are for placing the bone that will allow that spine to fuse so it will be stable and will take care of the problem for the long-term. And so that's what you see on that radiograph that he showed before and allows for multiple spaces for bone fusion, as you can see. There's plenty of space in there for bone fusion. It's made of plastic, nobody has -- as far as I know, I've never seen anybody, don't know anybody that has rejected this kind of material. And those metallic bars are made of titanium, so it shouldn't cause any problem. Okay? Now, going back, Dr. Uribe is basically giving the finishing touches to this operation. He's making sure that he's happy with the placement and he's going to try to place a plate that I showed you before, and that plate, again, is to give extra support to that spine. This will serve as those well-known pedicle screws that we put from the back of the spine in

the usual or typical open procedure. Now, pedicle screws these days still can be placed through a minimal access approach, and there are many surgeons out there that do it. This is something that you should discuss with your surgeon, because anybody can potentially be a candidate for this device or standard pedicle screw placement. One quick shot, can you give me a shot to the spine model here? This is what Dr. Uribe is working now, in placing that plate. Again, he will have two long screws that will attach a metallic bar to the spine there and secure those bones in place. Again, you can see the cage right here and the cage right there from side to side. And you can see, XLIF means extreme lateral interbody fusion, and that's what it means. Extreme, it's from the side, lateral, from the side. Interbody fusion, interbody is this little device that we place to allow for fusion. Simple to remember. Again, and there is Dr. Uribe working in the final stages, and again, we've now been here not even an hour yet and he's almost completely done with an L4/5 spine fusion. And if through an open approach, we may be talking about at least two and a half hours, somebody real experienced. It could go up to four hours if somebody -- a more difficult case. And again, you see the devices right here. He's all going through a small opening, there's not much that I can see even though I'm standing two feet away from him. This is the beauty of the approach, this is the beauty of this procedure, how small of a skin incision and how much you can do through that small opening. And again, you can see -- you can do more than one level. You can do one, you can do two, you can do three, you can do four.

00:55:38

JUAN URIBE, MD: Picture. Picture.

00:55:43

FERNANDO VALE, MD: And -- and again, when we do this, because of the small opening, recovery is extremely quick. This patient will be ambulating tomorrow. And if he feels like he's ready to go home, he can potentially go home tomorrow or the next day. Again, this is a decision that we'll make between the surgeon and the patient when the time comes, but the idea is to get up and around faster, home within 24, 48, at the latest 72 hours. After that, I probably would like to get him home myself. Seventy-two hours, in my own personal experience, most of these patients want to go home. They really want to go home within 24, 48 hours. And Dr. Uribe is finishing -- is placing the last screws in this surgery, and we are going to be done within the next few minutes. If you have any questions, please, this is the time to ask, because we are getting to the end of this surgery, and this is the placement of the last device. And again, a lot of hammering, but this is the way that the spine is. It's hard bone, we have to work through this bony surface. As you can see, he keeps constantly looking on x-ray, but this sort of x-ray that we use for the location of the instrumentation, they are safe, we take precautions to protect everybody, including the patient, and minimize their exposure. And that's the idea behind this. And now we're closing. I wish, if anybody has any questions, to please get it on the internet right now, because we are almost done to this. Okay, well, I would like Dr. Uribe to say a few last words, because we are closing soon, and this is going to be over in the next couple of minutes. Dr. Uribe?

00:57:58

JUAN URIBE, MD: Okay, now I'm in the process of finishing the procedure. I'm just putting the template for the plate, and two screws are going. As you can see, the screws are now going into there, and after the plate, we will be closing the skin. And that will be the whole procedure.

00:58:19

FERNANDO VALE, MD: Well, I would like to say thank you for the entire O.R. staff for this wonderful afternoon at Tampa General Hospital. I would like to thank the many people that help us here, Andrew, Hera, and Margaret, the rest of the reps that are

here, but we prefer to keep your names hidden in our own little treasure box. I would like to thank the anesthesia and the people from Tampa General Hospital for their help putting these webcasts together. If anybody has any questions, anybody wants to know about this operation, please, you can call us at the University of South Florida, Department of Neurosurgery Spine Section. Also you can go to the Tampa General Hospital web page, we can get access through physician finder. Dr. Juan Uribe, the surgeon, and Dr. Fernando Vale say thank you for this wonderful afternoon and hopefully see you soon.

00:59:21

ANNOUNCER: Thank you for watching this live XLIF procedure from Tampa General Hospital in Tampa, Florida. 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.

00:59:48

[end of webcast]