

**CERVICAL LAMINOPLASTY
UNIVERSITY HOSPITALS CASE MEDICAL CENTER
CLEVELAND, OHIO
September 11, 2007**

00:00:01

NARRATOR: Welcome to University Hospitals Case Medical Center IN Cleveland, Ohio. Over the next hour you'll see a cervical laminoplasty. Dr. Henry Bohlman, a world renowned spine surgeon will perform the surgery. This unique procedure is recommended for patients with painfully restricted spinal canals in their necks. The surgery immediately relieves pressure by creating more space for the spinal cord and roots. 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.

00:00:40

PAUL GAUSE, MD: Hi. Good morning. Welcome to University Hospitals Case Medical Center. Sorry for the delay in getting started. Today's case is a cervical laminoplasty. This procedure is performed to relieve the pressure on the spinal cord. The surgeon today is Dr. Henry Bohlman and we can give you a brief demonstration here about...for what this procedure is being performed for. Here is a...a magnetic resonance image of a patient that we're performing the surgery on today. And as we can see right here, this the spinal cord coming down the middle of the spine and the patient has a lot of degenerative changes which is causing pressure on the spinal cord at multiple levels. The patient's x-ray can also be seen here, and you can see that he has a fair amount of degenerative changes in his spine and he has a narrow spinal canal to begin with; the distance between here and here. So, because he has this issue at multiple levels, the most appropriate procedure for him is a cervical laminoplasty. And, if we could go to Dr. Bohlman, he can tell us where we are in the procedure.

00:01:55

HENRY H. BOHLMAN, MD: Am I...am I on? Okay. We're just trying to control some little bleeders laterally here so the...the field is quite dry before we start our laminoplasty. Now we've already taken an x-ray to identify the appropriate levels that we want to do. And...this is the fourth cervical vertebrae in the lamina, or the covering of the spinal canal here. This is the spinus process. This is the fifth and sixth laminae. So, our plan here is to burr with a power burr down through the laminae of these vertebrae; completely through on this right side and then halfway through on the left side here, remove a little soft tissue above and below and then eventually prop open the...prop open the lamina like this and then keep it propped open with some little plates we use for the laminoplasty.

00:03:12

PAUL GAUSE, MD: We want to remind viewers also if they have any questions during the webcast they can click the MDirectAccess button on their screen.

00:03:21

HENRY H. BOHLMAN, MD: Can you see the bleeders on that side better? Let me have the...Sorry. On. I was going to say left cell.

00:03:46

PAUL GAUSE, MD: You can see on the slides on here, if you can...if we can put that up, it's a...it's a picture of the...just a schematic drawing of the posterior spine. You can see in

the...this is the midline right here and the first cervical and second cervical vertebrae are...are illustrated there. We're going to be working down here and we just take the muscles off the...off the back of the...of the spine to allow us access to the...to the back of the...to the back of the vertebrae. And as Dr. Bohlman was saying, this is the area right here that we make a little trough in, in order to open the...the vertebra up. And that can be...

00:04:36

HENRY H. BOHLMAN, MD: We're taking some soft tissue off above and below the laminoplasty site so that we can clear this up in preparation for propping op...propping open the laminae.

00:04:59

PAUL GAUSE, MD: Dr. Bohlman, we have one question here sent in by a patient here saying, I have been diagnosed radiculopathy and spondylosis in the C3 to T4 region. Do you think that cervical laminoplasty could help me?

00:05:15

HENRY H. BOHLMAN, MD: C3 to C4 retic----

PAUL GAUSE, MD: C3 to T4.

00:05:20

HENRY H. BOHLMAN, MD: That doesn't sound possible to me to have...to have such a nerve root problem at that many levels. It would only probably be like this patient, cervical myelopathy or spinal cord compression. So that doesn't seem possible.

00:05:37

PAUL GAUSE, MD: Yeah. Maybe the person mean to say C3 to C4 instead of C3 to T4

HENRY H. BOHLMAN, MD: Right.

00:05:44

PAUL GAUSE, MD: But usually the laminoplasty is a procedure that's done for people with myelopathy or neural...spinal cord injury from pressure on the spinal cord at multiple...at multiple levels.

00:05:58

HENRY H. BOHLMAN, MD: And, may I have some bone wax on the two.

00:06:03

PAUL GAUSE, MD: People with isolated radiculopathy, or spondylosis at one level usually are treated with a different procedure.

00:06:15

HENRY H. BOHLMAN, MD: We're using a little bone wax here to control bleeding from the bone. And I think we're ready to start the laminoplasty, so may I have the burr? Is that bleeder controllable there? Let's see. Okay. So we're starting to burr through the laminae. This is C4. And we burr down until we can see the inside of the spinal canal – Penfield 4, please – until we can palpate the inside of the spinal canal in a soft area. For instance, right here. And that's the dural covering of the spinal cord right there. This is a special power burr that should not cur into soft tissue, so we can burr down to the...what is called the ligamentum flavum, or the soft tissue lining the spinal canal. Can I have the bone wax on the two, please? Okay. Oh, sorry.

00:08:31

PAUL GAUSE, MD: All right. We have another questions that says, what is the average recovery for a procedure such as this? Generally our patients stay in the hospital for, oh, one to two days postoperatively and we put them in a soft collar for comfort. But we encourage them to begin doing some neck movement in this time. The patients pave some operative pain for a couple of weeks after the surgery, but probably by a month to six weeks are back to close to their baseline. Do you have any thing to add to that Dr. Bohlman?

00:09:13

HENRY H. BOHLMAN, MD: I...I couldn't hear you there.

00:09:15

PAUL GAUSE, MD: The...the question is, what's the average recovery time for a procedure such as this.

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HENRY H. BOHLMAN, MD: Patient wears soft collar for comfort, which is usually about ten days to two weeks. They can remove that right away. And usually the muscle pain from the surgery is gone by about two weeks. People are up and about right away. They're in the hospital one to two days. Okay. [Lexo?] for a minute. Let me get this soft tissue from here. Take a little bit more soft tissue from the lamina so we can see where we're burring.

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PAUL GAUSE, MD: Some patients may also wonder why they have...or, what kind of symptoms a patients such as this was having. And he...He's in his mid-seventies. He's a retired gentlemen who is otherwise pretty active. He noticed this year that he started having some...as he...as he stated, quote "wobbly legs" and difficulty with balance. He was seen by his primary care physician and in the process of working him up got an MRI of his cervical spine due to a concern that he may have myelopathy; and, in fact, that's what he did have. Patients oftentimes will note that they have balance problems or clumsiness in the...in the hands or legs, and that's from pressure put on the spinal cord by the narrow canal to begin with, such as this gentleman, but also degenerative changes in the...in the spine that occur with aging.

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HENRY H. BOHLMAN, MD: There we go. We're just burring in slowly through these laminae until we feel soft tissue, which is the inside of spinal canal. And I periodically feel with a little instrument called a Penfield Elevator to see if we've gotten down to the soft tissue. That's this little instrument.

00:12:21

PAUL GAUSE, MD: So Dr. Bohlman there is just feeling to insure that he's burred through the ...the entire bony covering of the spine, so that down that side he's able to open up the...open up the back of the spinal cord to un-roof the...the spinal cord.

00:12:59

HENRY H. BOHLMAN, MD: Pen 4. That's the soft tissue here. Here. We've got a little more to go right there.

00:13:22

PAUL GAUSE, MD: And just to orient everybody to...to what they're...to what they're seeing, I'm not sure if Dr. Bohlman said this earlier, but the...the top of the patient's head is toward the top of the screen and the hairline is about the...the top of the incision. And this is right in the middle of the back of the neck.

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HENRY H. BOHLMAN, MD: So at this point we can feel that we're close to being completely through...the laminae suck in there, Paul. There's still some residual bone here, but I think I can get a small instrument in here and remove the remaining bone and the ligament to...go completely through on this side. Let me have a little wax on it too. Control the bone bleeding a little bit with some bone wax.

00:14:47

PAUL GAUSE, MD: Maybe one thing, Dr. Bohlman, that patients might want to know is what happens if they don't have their myelopathy treated.

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HENRY H. BOHLMAN, MD: Well, if myelopathy, or the spinal cord compression becomes increasingly severe, then patients develop paralysis in all four extremities and great difficulty walking. They have trouble with their balance and ultimately, in the most severe form, they become bedridden because they cannot stand on their feet. And, you might explain that there are different grades of cervical myelopathy. The least severe being abnormal neurologic findings such as hyperactive reflexes progressing to increasing

difficulty with activities of daily living, using their hands as well as stumbling when they walk. And ultimately the patients cannot walk without aid, and that's about the third grade. And they ultimately, the grade five, they become bedridden and are unable to stand, and that's the most severe form. And so, that's what we try and prevent by doing the operation. The other issue is a dangerous spinal cord injury in patients with such severe spinal cord compression such as this, they can be rear-ended in an auto accident or have a minor fall and injure the spinal cord and become quadriplegic just from a minor trauma. So it's important to do the procedure to make enough room for the spinal cord to protect it for the future. The Micro-Kerrison please. The next one up.

00:16:33

PAUL GAUSE, MD: As Dr. Bohlman was saying, we like to see the patients at the stage such as this gentleman who is still ambulatory and doing otherwise well. He's fairly early in his stage of his myelopathy, but untreated he would...he would progress, as Dr. Bohlman described. We're doing this procedure to...to halt the progression of his myelopathy so he can continue with his normal activities.

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HENRY H. BOHLMAN, MD: Now I'm using what's called a Carison rongeur, which is an instrument that cuts through the ligamentum flavum, or the tissue remaining over the spinal canal and through the remaining laminae. I need another medium that's not so strong sprunged. No, that's not it. There's another one that size. Just let me have that one. Will the table go down any? No. I can just barely see the...This is the ligamentum flavum that I'm removing and you can see the covering over the spinal cord just underneath it, which looks kind of gray in color. Put the bipolar on twenty. I mean, the bovie on twenty and the bipolar on twelve. This is called the bipolar bovie and it...it coagulates in-between it's teeth here, the ends. And it's very safe to do this on the surface of the spinal cord because it won't conduct heat to the spinal cord. Okay, could we clean that? A Carison. Can I have a damp Caris...a damp sponge, please. Thank you. Up here, Paul.

00:20:12

PAUL GAUSE, MD: All right. Dr. Bohlman on this side is just completing the...the trough on the...on the patient's right side in order to...to open up the posterior covering over the spinal cord. Once he's done with this, he on the other side will do what looks to be a similar process, but...but as he's going down he carefully only burrs down the posterior covering of the bone so that the other side acts as a hinge and the posterior aspect of the...of the...of the bone of the spine does not come detached from the...from the rest of the...the body of the spine. The...the...One of the benefits of a procedure such as this...

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HENRY H. BOHLMAN, MD: We can burr down on the opposite side now.

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PAUL GAUSE, MD: One of the benefits is that this is not a fusion type of procedure. Meaning that the...our goal is not to have the bones grow together to give the...the stability to the spine. Instead the...the plates that you'll see that we use just hold the canal open such that the spinal cord itself has more room. There are other types of procedures that we do where we do try to get the one to grow together but, obviously, the...that significantly diminishes the motion and halts the motion at those levels that we treat.

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HENRY H. BOHLMAN, MD: Paul? Just let me mention, we're going to start bearing down on the let side of the laminae. And here we're only going to burr halfway through, so that leaves us a little hinge with which to prop open the...hinge open the laminae. Bipolar. Okay.

00:22:48

PAUL GAUSE, MD: We have a few questions here also, Dr. Bohlman. One of them is, how many...how many of these do we perform at UH each year?

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HENRY H. BOHLMAN, MD: Oh, I would...I would guess forty to fifty.

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PAUL GAUSE, MD: And...how common is the procedure? The procedure was developed in the eighties and---

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HENRY H. BOHLMAN, MD: It was actually begun predominantly in Japan many years ago for a disease that occurs over there, which is bone formation within the spinal canal compressing the spinal cord over a long span. And so the Japanese really pioneered the procedure for that disease, which has become more prevalent in the United States now. But, it's most applicable here because of the multiple levels of narrowing of the spinal canal this patient was born with and the progressive arthritis further compressing the spinal cord.

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PAUL GAUSE, MD: and the next questions is, all there...are there any alternatives to the procedure? There are a number of alternatives to treating the disease in the spine. One would be to completely remove the bony covering over the back of the spine, but in...in doing that we are very concerned about destabilizing the spine.

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HENRY H. BOHLMAN, MD: Well, that's...that's an alternative, but it's a laminectomy and exposes the spinal cord completely. And I think is not a good procedure and can lead to progressive deformity of the spinal cord over a long period of time. Wax on the two.

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PAUL GAUSE, MD: When that...when that procedure is done, it's often done in combination with a fusion to stop the motion. Are there any drawbacks to having this procedure done?

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HENRY H. BOHLMAN, MD: Any drawback to what?

PAUL GAUSE, MD: Having the...having this operation?

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HENRY H. BOHLMAN, MD: It's been reported that people can have neck pain following the procedure. Suck down there, please. But I think that's a pretty rare occurrence. They're usually pretty comfortable with it. It doesn't cause any weakening of the spine and you still maintain your basic muscle strength and structures of the spine. So I think it's a good procedure, from that standpoint. Let's get this out. A little more wax on the two. So I've burred halfway down through the left side of the laminae and in a minute I'm going to test this to see if it will pop open. If it doesn't, we'll take a little more bone off. You can see we've tried to meticulously control the bleeders throughout the procedure. Okay. Dressing forceps. And let me have a small Coker. Suck up here a minute and let me see if this....I think he's bleeding from this. Let me have a little bone wax on it too. Can everybody see okay? Okay. So we will use a small what we call a Coker clamp to see if...if the laminoplasty will...will open up. And, indeed, it looks like it will. And it's...Suck along the spinal cord there. And there's the spinal cord covering right there. Let me...Paul, you hold that open a little bit. Let me have a Penfield Three to...There are a few adhesions or some little tissue, which is stuck to the spinal cord, so we'll sort of free them up underneath though. The cord will expand as we open up the laminoplasty. You can actually get a sense for the spinal cord expanding out when we lift the laminoplasty out. And this is the spinal cord covering right here. We always check with the spinal cord monitoring. Chris, are you over there?

CHRIS: Yes. [Inaudible].

00:28:20

HENRY H. BOHLMAN, MD: There's very little, if any, manipulation of the spinal cord. And pull that open a little bit more and let's see if we can get a...I'd like to get a clamp on that. I'm not sure we'll be able to. Okay, let that go a minute, Paul. See if we can get...It looks

like...Pen Four. For sure we can get a...a plate on that. We ought to be able to get a plate right there.

00:28:42

PAUL GAUSE, MD: Okay. Now the...the slide shows here that...It's just a photograph of the procedure that Dr. Bohlman has done and it may be just a little bit...a little bit clearer. You can see the patient's head is on the left side and you can see the trough burred down both sides along the bone to allow the opening of...over the spinal cord that Dr. Bohlman is currently doing.

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HENRY H. BOHLMAN, MD: Just clearing off a little bone so that we can apply the laminoplasty plates. Again, this is the fourth vertebrae and this is the sixth vertebrae. Looks good.

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PAUL GAUSE, MD: And Dr. Bohlman was just talking about our spinal cord monitoring.

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HENRY H. BOHLMAN, MD: So let's have the...a plate and the Kelly clamp.

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PAUL GAUSE, MD: And, we have Chris, our neuron-monitor, who is making sure that all of our...all of our signals showing the function of the nerves and the...and the brain also, are normal during the procedure. Just a safety measure.

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HENRY H. BOHLMAN, MD: Okay, Paul, can you drill that. I'll...I'll hold it open. You...Let go. Oop.

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PAUL GAUSE, MD: Dr. Bohlman here is placing a plate between the lamina and the facet in order to open up the...the...the posterior aspect of the spine in order to keep it open and insure that the...the increased space that we're making for the spinal cord is maintained.

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HENRY H. BOHLMAN, MD: I got it. Get a drill. Give me the drill. Drill...drill in the lamina first.

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PAUL GAUSE, MD: Since...since our view is blocked right here, I have a slide up that gives a diagram of what Dr. Bohlman is...is currently doing right now. You can see this is the...this is the opened up part of the...of the lamina that is done. And this plate right here sits over this in order to...in order to hold the...the...the spinus process up in order...to prevent it...the trap door from closing back down. And the picture on the right is with several of those plates in place. And the picture on the top left is actually the picture of the plates that we're using. And the picture in the top in the center is a CT Scan postoperatively, demonstrating a nice opening up of the spinal canal.

00:31:51

HENRY H. BOHLMAN, MD: Let me take some of this bone off here to flatten this off a little bit. Let me see a small rongeur. So we have one screw in this first plate. I'm going to smooth the bone off here so we can seat the plate over here properly. Okay. Kelly. It's still not seating down there. Let me take it a little up here. Give me the small rongeur again. Okay. Kelly. Can you loosen that screw a little bit, Paul, so I can seat this a little bit better?

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PAUL: Have you got the screwdriver there, please. Thank you.

00:33:07

HENRY H. BOHLMAN, MD: Okay. I think you can screw right in there. Down here.

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PAUL: Do you want me to tighten this?

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HENRY H. BOHLMAN, MD: No, no. Don't. No. Put that in first.

PAUL: Can I have the screwdriver, please...or, the drill please? Thank you.

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PAUL GAUSE, MD: A couple of questions---

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HENRY H. BOHLMAN, MD: We're drilling a hole on the lateral, or right side, and we'll put...I don't think...Are we deep enough in there?

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PAUL: Yeah. See the....

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PAUL GAUSE, MD: A couple of other question have been asked, Dr. Bohlman. Is there an age limit, do you think, for this operation?

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HENRY H. BOHLMAN, MD: No. I think age is not a criteria for when we think surgery is indicated. Is someone is eighty-five years old and they're starting to stumble around and they can't walk, it's a very safe procedure---

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PAUL: Would you like me to place [inaudible]?

00:34:01

HENRY H. BOHLMAN, MD: Yeah. Very safe procedure. Highly effective for the spinal cord compression. And I think it should be offered to a patient at any age. If they're active... physically active people, mentally active, I think it should be offered, because it's a very safe procedure, fairly short time-wise and the patients notice immediate difference in their functionality before they leave the hospital. They're balance is better and they're able to walk better right away. Because it...as you will see, it's instant decompression of the spinal cord. Go ahead.

00:35:02

PAUL: Screw, please.

00:35:08

HENRY H. BOHLMAN, MD: I once operated on a very famous man from Cleveland, who will remain anonymous, but he was...two weeks before his 101st birthday when he had such severe arthritis of the---

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PAUL: [Inaudible].

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HENRY H. BOHLMAN, MD: Yeah, that's good. Arthritis of the lower lumbar spinal canal that he couldn't hardly walk. And we wound up decompressing him and he became completely ambulatory and a functional walker, and continued to give speeches all over the country and actually wrote two books, one on the history of his company and one on why you shouldn't form unions. So age is not a criteria for who we operate on. Good, Paul. Let's see the sucker a minute.

00:36:00

PAUL GAUSE, MD: Another question is, are there any contraindications to doing the operation.

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HENRY H. BOHLMAN, MD: Yes, there's one contraindication for sure, and that's a patient that has a flex...a fixed flexion or bending forward deformity of the cervical spine. Then that's a contraindication to do this procedure because that...it will make the deformity worse. So it's only in patients who have a relatively straight spine....Let me have the Coker. Actually, let me have the Kelly and the plate. I think I can just put it on there. Now we can get it...Let me take some of this...

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PAUL GAUSE, MD: So Dr. Bohlman here is placing the second plate lower down on the cervical spine. Question from Carolyn asks if there's...if this incision is done from the front or the back of the neck? This is done from the back of the neck. Next question is from Chris, asking if this disease process occurs more in the cervical spine compared to the lumbar and thoracic spine? I'll go ahead and answer that while Dr. Bohlman is doing this. The...the thoracic spine is a relatively spare and degenerative processes because there's not much movement in it. However, the...the cervical and lumbar spine are by far the most common areas of the spine that are affected by degenerative changes, such as this. In the...in the cervical spine, the spinal cord is still present, so when this degenerative process occurs and pushes on the spinal cord it can actually cause injury to the spinal cord. In the...in the lower spine, the lumbar spine, there are only nerve roots themselves that remain, so that the type of symptoms people get are generally different. It's not the...not necessarily the clumsiness as much as it is pain radiating down into the legs and difficulty walking. So this is...again, it's more common in the cervical spine to have myelopathy such as this from degenerative changes. In the lumbar spine it's more kind of slow progression of cramping in the legs with prolonged walking that...that is the issue.

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HENRY H. BOHLMAN, MD: We've got it. Put that screw in. Yes. Okay. That's good.

PAUL: Take the drill back, please.

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PAUL GAUSE, MD: As Dr. Bohlman is putting in this last plate I have a...I have a side here. It's a pre-op and a postoperative MRI of a patient that had a laminoplasty done. And you can see on the left side is the preoperative. And you can see the...the white there is the spinal fluid around the spinal cord itself. And the gray is the spine. You can see that it's very tightly squeezed there in the mid-cervical spine. And the lower section is a cross section. Kind of like a slice through the...through the spine. You can see that there is very little room around the spine.

On the...on the right side is a postoperative MRI of the same patient and you can see really instantly that there is significant pressure taken off the...off the spinal cord with a lot more of the spinal fluid around it. And you can see that the remaining lamina back behind it has opened up again. It's not removed; it's just opened up to allow more space.

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HENRY H. BOHLMAN, MD: We'll need a little longer screw for the second hole. But the next screw I think will be in the lamina, so just give us the same...Okay. Can I have the drill. I'll drill from my side and they you can...we'll see if we can get this in.

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PAUL GAUSE, MD: There's a question. Linda, who asked...a neurosurgeon told her eventually she will need a procedure to fuse C4 to C6. She says she knows it's inevitable, but how will she know when it's time to do it? In general, it's...it's difficult to answer with the amount of information that you gave us. It's...If...if your symptoms are arm pain, it's a little bit different than what we're talking about here. This...this patient was done for pressure on the spinal cord that can cause irreversible permanent changes. So if it's...if it's myelopathy, again, Dr. Bohlman was saying that he believes in...in treating it early to halt the progression of the disease. If it's...if it's pain in the...in the arms, I think that's more of a...a question for the patient is when is that...is the discomfort no longer comfortable and when do they want to do something about it.

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HENRY H. BOHLMAN, MD: Okay. Let me have some...We're all through. Let me have some antibiotic irrigation. So we're essentially through the procedure. I'm going to irrigate this out so we can see the soft tissues. And a little antibiotic irrigation solution. Let me have some damp sponges and the dressing forceps. The procedure takes normally about an hour and twenty minutes. It's not a very long procedure. And I just want to point out....Let me have bayonet...point out to you the expansive...expanded spinal cord. This is the covering of

the spinal cord here, which is bulging out, which is what we like to see. So, these are the plates propping up in the laminoplasty and...that's it. Any further questions? Can you guys see the spinal cord there? I'll put my light on it. Let me have a Penfield 4 and then I'll...So what we do...Let me just point out the spinal cord here. Here. So there is immediate room for the spinal cord. This is the covering over the spinal cord. You actually don't see the spinal cord itself, which is inside this dural sac, is what we call it. So what we do is put what's called gelatin sponge to cover over the dura and preventing further bleeding, and then close up the wound. Bayonet and some gel foam. And this gelatin sponge prevents further bleeding around the spinal cord. We use this all the time in spinal surgery. One more little piece and I think that will do it. Okay, let me just dry it off. And there we are. It's been a pleasure. Any more questions?

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PAUL GAUSE, MD: I don't think so. This...this slide that I have up here is just the schematic again. IT was done in a cadaver showing the amount of extra room that's available for the spinal cord. On the...on the left you can see it there. There is...the spinal cord is essentially draped over---

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HENRY H. BOHLMAN, MD: These are...I should mention these laminoplasty plates are---

PAUL GAUSE, MD: I'll go back to Dr. Bohlman.

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HENRY H. BOHLMAN, MD: ---were designed by Dr. John Heller at Amber University and they're manufactured by Medtronic. Oh, put that gel foam back in there. I sucked it up. And they are specifically for laminoplasty...bayonet. So they work just perfectly. In the old days we used to take bone graft and fashion that and prop open the lamina, but this makes the procedure so much easier and so much faster. So you really don't need any bone graft in this operation.

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PAUL GAUSE, MD: Any...any other...any other thoughts there, Dr. Bohlman? Any closing remarks?

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HENRY H. BOHLMAN, MD: No. We put in a drain, a suction drain, and that comes out before the patient goes home. And as I mentioned, the...people have muscular discomfort in their neck for ten days to two weeks for which they can wear a soft collar. But that usually goes away fairly quickly. And they're...It's really not a difficult procedure to get over. Sometimes we do postoperative MRIs. And if you do, you can see the expansion of the spinal canal and the spinal cord gaining lots of room and floating free. But we don't do this routinely for cost purposes.

00:46:07

PAUL GAUSE, MD: Well, as Dr. Bohlman was saying, the...the remainder of the procedure is just closing of the musculature and the skin over the...over the spine. And we put the patient into a soft collar right away so that they're able to move their neck. The collar just gives them a little support, and they're in the hospital for a day or two. Thanks again to the...to the OR staff for helping us out today. Is there anything else, John? All right. Goodbye. Thank you very much for joining us.

00:46:46

NARRATOR: This has been a cervical laminoplasty from University Hospitals Case Medical Center in Cleveland, Ohio. 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.

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[END OF WEBCAST.]