ANTI-REFLUX SURGERY FROM THE UNIVERSITY OF MARYLAND MEDICAL CENTER, BALTIMORE, MD

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SPEAKER

When Sylvia Kramer began to experience extreme heartburn, surgeons at the University of Maryland Medical Center in Baltimore helped her to overcome the discomfort of gastroesaphogeal reflux disease, or GERD.

SYLVIA KRAMER

I had acid reflux, of course, because of the hiatal hernia. And if I did tend to regurgitate, I was getting a radiating feeling in my back, which was a rather new symptom.

SPEAKER

Relief for Sylvia came when surgeons performed anti-reflux surgery. With just five small incisions, surgeons repaired the muscle that separates the stomach and esophagus.

DOCTOR

If patients have typical symptoms of GERD, the heartburn, the belching, the regurgitation, what we call the water brash, the bitter taste. Then anti-reflux surgery provides a dramatic and fairly immediate improvement in those symptoms.

SPEAKER

During the next hour, you'll see surgeons at the University of Maryland Medical Center perform anti-reflux surgery. To send questions to the operating room at any time, just click the email the OR button. For continuing medical education credit, be sure to answer the questions at the end of the presentation by clicking on the CME screen. This live web cast is coming to you from University of Maryland Medical Center in Baltimore, Maryland.

DR. ROTH

Welcome to the University of Maryland Medical Center. We're live in operating room 23 where we're performing a laparoscopic Nissen Fundoplication as a procedure for acid reflux disease. I'm Dr. Scott Roth, head of surgical endoscopy here at the University of Maryland Medical Center. Today with us also is Dr. Paul Castellanos. He's the Medical Director of the voice, swallowing, and esophageal disorders clinic. He will be providing commentary for us as well. Additionally with us today is Dr. Adrian Park, the head of general surgery. He is performing the laparoscopic Nissen Fundoplication currently as we speak. Dr. Park?

DR. PARK

Thanks, Scott. This is where we have our trocars in and all that. So, the operation has just started, but we're not too far into it now, just kind of orient our viewers a little bit to what we're doing. I don't know if we can have the inside view at this point, but uh, this is a young woman, a

43 year old woman who has uh, presented with symptoms when she was off medication that are very classic for severe reflux. The heartburn, the regurgitation. And, even on maximum medical therapy, she began to develop symptoms that were more atypical and consistent with what we call LERD, or laryngeal extra esophageal reflux disease. And, these are symptoms that I'm sure Dr. Castellanos is going to want to expand on a little bit more later on. What she developed was a worsening hoarseness over the past several years and problems with difficulty in swallowing sensation as well as excessive belching. We understand more and more as we better understand this disorder, these symptoms can all be brought about by significant reflux. So, just to orient folks as to where we are, the liver elevated here, and we're working up towards the gastroesophageal junction, which will be right there. He haven't yet exposed the esophagus. This thing that's beating up here is the, we're on the diaphragm right underneath the patient's heart. This is what we call one of the suspensory ligaments of the liver. And, so we have here the stomach and over in what we call the left upper quadrant here is the, is the spleen. And, we've divided already a couple of the short gastric vessels that sometimes attached right to the spleen and that we need to mobilize so that we can effectively perform this Fundoplication, or wrap. And, just coming back down, we're already inching a little bit to the other parts of the upper abdomen. People don't get to see this anatomy too often, but, this is the gall bladder. This is a normal and healthy looking gall bladder and here's the other lobe of the liver, right lobe. So, we're looking up towards the upper abdomen as we do this. Now, one of the first things we want to do now is to expose the esophagus. So, my trusty assistant, Mary here, will provide this exposure. Dr. McKinley will give me a great view. And, this is what we call the phrenic esophageal ligament. We've already had an esophageal bougie set in place. And, so we want to expose, very carefully, the esophagus. So, this is a very fine ligament that sometimes gets stretched in patients. It plays a role in performing the anti-reflux barrier. So, this one is not attenuated. Unfortunately we have to go through it to get to the anatomy we need to get to. So, I'm dividing the phrenic esophageal ligament here, and we hope to expose in fairly short order, the esophagus. And, we do this now and at some point we'll have a chance to show you how our trocars are set up. We use three or four trocars that are only about five millimeters in diameter, about a quarter of an inch incision we need to put them in. And, this kind of, and then one trocar that's about a half inch. And, this kind of is in contrast with the historic incision, a big abdominal incision, or even an incision through the left chest. So, now we're starting to see the esophagus coming in to, this is the esophagus right here that we're starting to expose. And, I'm actually starting to create the space very gently between the right side of the esophagus which is right here, what we call the diaphragmatic crus, the right crus, which is right there. We're going to continue to, there's a very healthy looking diaphragmatic crus there, very young, healthy patient. And, we'll be reconstituting this a little bit to help us with the anti-reflex barrier that we're going to help create for this patient. We're using an energy source here in my right hand. It's called the ultrasonic dissector, and it makes use of high, high frequency ultrasound. It helps us dissect tissue and maintain, and to stop bleeding if we see bleeding. So, now what I see on this side is what we call the left diaphragmatic crus. And, it's part of the what call, it's almost an external sphincter, an external layer of protection in the anti-reflux barrier that in a lot of patients who have reflux, it kind of gets stretched. And, this is where we get a hiatal hernia. So, this is the hiatus, the esophageal hiatus, and this isn't a very big hiatal hernia. This lady had a very small hiatal hernia, but these can get much, much bigger than this. But, this is what we call a hiatal, this is the hiatus, and that's where a hiatal hernia lives. So, now we're just taking more of the attachments to mobilize the esophagus a little bit. Again, here is, here is the left side of the patient's esophagus. And, right in behind, right there is the patient's aorta. So, we're just kind of creating that space that's called the preaortic facia. And, we want to just, under careful direct

visualization we want to just open that space up a little bit more. And, to go back to this side now. Dr. McKinley in there to get a little retraction and we're going to do the same thing. Can I now ask, please, you bring that bougie back to the 25 centimeter position.

DR. ROTH

As Dr. Park is working around the esophagus, I'd like to draw your attention to the operating room. This procedure requires several personnel in the operating room. Obviously the surgeon is performing the operation, but it also requires an assistant. And, today's assistant is Dr. Rod McKinley, who's the clinical fellow here at the University of Maryland. Additionally requires a circulating nurse, who today is Paula. A scrub technician, Mary, as well as an anesthesiologist, who today is Dr. Jasid Atwald. As you look around the operating room you can see that there's extensive equipment and monitors here at the University of Maryland we consider our operating room the operating room of the future. And, the facilities here with the, with the cameras and monitors suspended from the ceiling really facilitates surgery. And, we feel that the product that we offer here is exceptional. Just to discuss reflux a little bit, reflux disease is very common. It accounts for over three quarters of the pathology of the foregut. Almost everyone experiences some reflux on a daily basis. Up to seven percent of the population has it on a daily basis. And, as much as a third of the population will experience reflux on a monthly basis. When we talk about gastroesophageal reflux disease, we typically talk about symptoms as being either typical or atypical. When we talk about typical symptoms, we mean things like heartburn or regurgitation of fluid. Some patients with reflux will have chest pain or discomfort around their sternum. Additionally patients may have a symptom that we refer to as water brash. Which is a bitter taste in the back of the throat or a sensation of hypersalivation. Additionally, many patients with reflux are unable to lay flat on their back. If they do lay flat on their back regurgitive will actually come up their esophagus and come up their wind pipe and may cause symptoms of coughing. Some generic symptoms such as nausea or gastric pain, pain that is high up in the abdomen are also typical of reflux disease. Today's patient is actually suffering from some atypical symptoms of gastroesophageal reflux disease. Dr. Castellanos is an expert in treating patients with atypical pulmonary symptoms associated with reflux. And, I'll let him discuss that now.

DR. CASTELLANOS

Thank you, Scott. That's correct. This patient in effect, is an interesting example of the blend of the two categories of the disease. She certainly had some of the typical symptoms that you described. Particularly prior to her starting on unreasonable acid suppression as was done some months ago. But, she also had a number of atypical symptoms that caused her problem to be difficult to identify and as a result she wasn't getting sufficiently aggressive acid suppression as is necessary to treat patients with laryngeal pharyngeal symptoms of reflux. And, that's where the term LERD has been coined here at the University of Maryland, to demonstrate the similarity between the two processes. That is to say that both are dealing with the end product of the reflux of fluids from the stomach. The acidity and the enzymes that are coming up into the esophagus. But, the laryngeal pharyngeal extraesophageal reflux patient, or the LERD patient will have much more in the way of laryngeal symptoms, throat symptoms, hoarseness. Perhaps exacerbations of their asthma, perhaps excessive throat clearing or problems with episodically not being able to catch their breath. They get what's called laryngospasms. And, if you've ever had laryngospasms, you know it's an extremely alarming problem. So, this is a patient that is an

excellent example of the two spheres of reflux related problems that can be treated by this excellent operation.

DR. ROTH

When you talk about reflux, there's primarily three components that are causes of reflux. Fortunately most cases of reflux disease are caused by an incompetent lower esophageal sphincter. And, that accounts for upwards of 70 percent of all patients with reflux. However, patients with reflux may also have problems with their esophageal motility and their esophagus is not pumping normally. Additionally, some patients with reflux will have abnormalities of their gastric reservoir, meaning their stomach doesn't empty appropriately. And, as a result of their stomach not emptying properly, the stomach fills with fluid and that fluid is actually forced back up through the valve into the esophagus. The operation is geared at restructuring the valve and creating a competent lower esophageal sphincter.

DR. PARK

Scott, I can kind of show you what you guys have been teaching on reflux, I can kind of show you the steps we've taken since then. What I, my left handed instrument is now around the esophagus. So, here is the patient's esophagus. This is the level of the gastroesophageal junction, here's the fundis of the stomach. This has been done under direct visualization for the anonymous in the audience, this is the anterior Vegas nerve coming down right here. We take great pains to identify and avoid any injury to that. And, I now have just put in what we call a Penrose drain, which is an instrument to help me suspend and retract the esophagus as we start to affect the repair. And, I'm going to get my assistant to help grasp this now.

DR. ROTH

I just want to remind everyone at home that you can send us an email and we'll be happy to answer your questions. Dr. Park, we had a few questions already. You used some terminology when you described your procedure. The first was trocar and the second was a bougie. Some of our viewer are curious as to what those terms mean.

DR. PARK

Sure. Well, a trocar is, simply it's like a tube. When we do laparoscopic surgery we need a way to introduce our instruments into the abdomen. It's a, it's kind of a closed system because we need to maintain the gas to give us this fluid insufflate. So, we need to have ports that are sealed and airtight that allow us to introduce instruments in and out. So, those are what trocars are, that's what trocars are. And, they come in various shapes and sizes, they are kind of like portals of entry. They are kind of like portals of entry for our instruments. Now, the other question was about a bougie. A bougie essentially helps us to, it can be used in various capacities. And, this, sometimes we use it if a patient has strictures in their esophagus that need to be dilated. In this situation that's not what we're using it for. It's a rubber, it's a rubber tube. It's a solid rubber tube, if you would, that can be used to dilate or to size the esophagus. And, in this instance, we're using it actually to size the esophagus, to help locate the esophagus. Sometimes, particularly in larger patients - that doesn't apply to this patient – the esophagus can be very large or very hidden and harder to find. So the bougie helps us locate the esophagus and in this

situation it helps us size the repair that we're going to do. What I'm doing now, it looks a little bit oozy, and laparoscopy can often magnify the extent of oozing. But, what we're doing right now is just making sure that those things that are trying to attach the esophagus posteriorly are divided so that her hiatal hernia, these all will help to kind of diminish the chances of a recurrence of her hiatal hernia. Let me give you an example of the magnitude of the space that we're looking at. This whole space that I'm working in right here is about the size of a dime. So, that's about the size of a dime, and it's just well magnified, so these are, and the advantages of minimal evasive surgery are that we can do this, you know, reparative or reconstructive surgery just as effectively and sometimes even more effectively than open surgery. But, we can do it with such little trauma. We can just get straight to where we need to go. We see so very well, and we only can open those spaces that we absolutely need to open to get to the target anatomy.

DR. ROTH

As you can see on the slide here, there's several components of the lower esophageal sphincter. And, the goal of this operation is to recreate a new sphincter using the patient's own anatomy and their own blood supply. This patient did not have much of a hiatal hernia. However, patients with hiatal hernias, one of the goals of the operation is to restore the esophageal sphincter back into the abdomen. So, we want to actually create a new sphincter that has a normal pressure. We want to have an adequate total length of the valve, and we also want to make sure that portion of that valve is located within the abdominal cavity so that any increases in pressure within the abdomen are actually transmitted to that valve.

DR. PARK

So, I'll show you in a second, posterially. I'm trying to preserve this vessel. This is a, it's a slightly unusual variant of normal anatomy. It's not abnormal anatomy, it's just the way this vessel is running we only see it about ten percent of the time, this vessel running this way. The posterior Vegas is lying in this bundle right here. We've already preserved the anterior Vegas, if you'll just come in a sec, Rod, we'll complete our window here. We're about to carry out the hiatal hernia repair. We've got our nice window here and we got our crura nicely exposed. And so, again, now what we have, we have a little what looks like a smoky, but that's just the energy from the ultrasonic dissector. But, we have the esophagus elevated here, which is right here. This is the gastroesophageal junction right here. We have the left crus of the diaphragm right here, posteriorly. And, the right crus of the diaphragm here, posteriorly. So, again, in patients with large hiatal hernias, this is a big space. This patient does not have a large one. One stitch will probably repair this and be able to reapproximate these crura in a way that will serve his patient very well. So, now what we're going to do is we're going to introduce the stitch. And, again, we used to always do this with open surgery, and now we, we can do this laparoscopically. So, we've brought a stitch in through one of the trocars. And, I'm now going to reconstitute and reapproximate her crura. And, if I'm at all uncertain about the tightness, then I will bring the bougie down to make sure it's not too tight or it's the right size for her. And, a lot of the pre-op testing that we do serves to kind of help me tailor this surgery exactly to the patient's anatomy and physiology. So, and you'll see in just one sec, so I've take bites out of both the right and left crura, and you'll see I'm not getting it tight, but right now, see how that brings that together, and that space is close. Now I'm going to ask, very gently just to bring the Penrose down just a little bit, just relax. Down with the bougie again please, slowly. Down just

slowly to 35, 45, any resistance just stop. We're going to watch the, sometimes you actually see the bougie just kind of ripple. Ok, keep going slowly. Ok, keep going, there we go, that's the bougie going through, that's fine. Now, you can…no resistance? Ok, back up to 25 with it please. And, so that bougie, that sizor that we just had introduced down to the distal esophagus is larger than the equivalent of a, if she was going to eat a lump of steak. So, it's a large sizor, and I know if she tolerates that well, then she will tolerate the wrap well and the closure well. So, now I'm just simply repairing this hiatal hernia. Elevate the Penrose again, elevate, no, this way please, just like that, gently. And, so again, we used to do this all open and now we can do this laparoscopically.

DR. ROTH

As you close that cray, Adrian, we have a question. Are all patients candidates for gastroesophageal reflux disease? Excuse me, are all candidates, all patients with gastroesophageal reflux disease candidates for this operation?

DR. PARK

No, we really take a real stepwise approach to the treatment of reflux. And, the patients who are candidates for this surgery are those who have either failed medical therapy, and by that I mean they've been through lifestyle modifications, they've, they know of adjusting when they eat, what they eat, how much they eat. Smoking, we always try to get patients to stop. Alcohol can also lead to worsening reflux. And, so when they've done that and they've been through the various medications and those don't afford them the relief of symptoms, then they tend to be candidates for surgery. Some patients on medication are tired of taking the medication. And, for those patients, again, if they want surgery as an alternative to lifelong medication, now that's very viable alternative now. Some patients suffer complications of reflux disease. And bleeding, stricture or tightening in the esophagus and shortening of the esophagus, Barrett's esophagus. And, of course the whole atypical panoply of symptoms that Dr. Castellanos was alluding to. So, we take a stepwise approach to these, and for those patients who come forward to surgery, it's a very effective treatment for reflux disease. Ok, so what we've now done is that's all it's going to take for that. I'm not going to put any more stitches in, it's sized very nicely. Those crura are back together. And, we are going to look now for the best place to, we've mobilized the fundis of this lady's stomach. And, we are not going to just select the best place on her stomach. This is the fundis on her stomach. And, the beauty of this procedure, and I know you're got some slides to show this more schematically later. But, the beauty, we've tried various things throughout the history of surgery to effect a good anti-reflex barrier. And, the beauty of using the stomach is that, first of all, it's the patient's own tissue, they're not going to reject it. It has the patient's own blood supply, we don't have to worry about creating any new blood supplies. It has their own nerve supply, you've already seen the Vegas nerve coming down and that innervates the stomach. So, this tissue will respond to the patient's directions from a nerve standpoint. So, it's a tremendously effective anti-reflux barrier. And, it's better than any kind of prosthetic rings and things we've tried to put in the past. So, I'm thinking that this is a good spot on the fundis to draw around for out Fundoplication. I'll have you elevate the esophagus just like that if you would, please. And, I'm going to come behind the esophagus and I'm going to hand this portion of the stomach to myself. We're going to come back, and this is, I'm drawing this through the esophageal window that I have created. So, I've got my crura reapproximated, my diaphragm, I got my crura reapproximated. And, now I have brought the

fundis through the retroesophageal window. We'll take out my drain which I used for a tractor. We'll take that out. And, this is one of the things that I do to make sure that the wrap is lying in good position. I'm doing my little shoe shine routine here to make sure it's not tight and it easily moves back and forth, which it does. And, again, there are the technical and mechanical elements to this operation, and there are also, it takes a lot of time and experience to understand the right architecture of this wrap. So, that's when I take these moments to try to assess for this patient. And, I can have my assistants, again, hold on to the, why don't we just grab that just like that. And, now we're going to create the fundoplication using the patient's fundis, obviously. And again, I mobilized elements of the fundis already to give us the kind of distance that we need. So, there we are right out to the short gastric vessel. That should work very nicely. And, I'm going to just do a few very simple stitches to get this in place. So, I'm handing myself my stitch here, I'm coming right out to the edge of the fundis. There's the short gastric vessel, I don't want to disturb that little guy. I'm going to take a, some surgeons tend to not take a bite of the esophagus for this. Come off to the side a little bit so I avoid any potential injury to the Vegas nerve. And, you'll see in a moment how this kind of just, and again, I'm going to do one more time, I'm going to ask to just advance very slowly the bougie, please. And, I'm going to test one more time that this is not too tight a repair. So, just gently down with that bougie, please.

DR. ROTH

We have a question from an email asking if patients with a previous old fashioned gall bladder operation would be a candidate for this procedure?

DR. PARK

Yeah, if they failed the old repair.

DR. ROTH

A patient with a previous open gall bladder operation.

DR. PARK

Oh yes. Yes, they would. As we've got more experience with this we definitely encounter patients who have all sorts of abdominal surgeries. Colon resections, gall bladder operations, all sorts of folks with hysterectomies and things like that. So, yes indeed. Now, we have that bougie down. And, it's in place, advance it slowly a little bit more, please. Ok, keep going, another few centimeters. Any resistance? Ok, stop please. Ok, so now I have a large dilator in place and I have my stitch in place. So, I know that this esophagus will well accommodate this wrap. I'm just going to tie this down now. Sometimes it comes down well with the bougie in place. Sometimes I just bring the bougie back. Ok, back with the bougie, please. I only got one stitch on there. Never mind, hold the bougie steady, please. So, we're going to try this again where we're going to see if we can lock the stitch down with the bougie in place. The extra large stitch helps.

DR. ROTH

The sutures, if you want to show the schematic of the incisions that are utilized to do this operation, emphasizing that this truly is a minimally invasive operation. As you can see on this cartoon, there are actually five trocars or tubes that are utilized to do this operation. Three of these are five millimeters in size, and two of them are ten millimeters in size. So, post operatively, these patients do very well, minimal post operative discomfort. Most patients are able to go home from the hospital within 23 hours and are back to their normal activities usually within one to two weeks. So, the recovery really is very good compared to the traditional open operation where a patient can spend five to seven days in the hospital and would be out of work and be recovering at home for a time period of six to eight weeks.

DR. PARK

Ok, and we're actually going to get [unintelligible] off in one sec, let me just take this off one sec. I think we've got oodles of…might as well give that to you. Can you bring, I'll put one more stitch and then we'll bring the bougie out. So, and you'll see in just a sec how well, many of you of course will not have seen what a textbook wrap is supposed to look like, so that won't mean anything to you. But, anyway, you'll see what hopefully will look like a textbook wrap in just one more stitch or two. So, we're coming out again to the fundis, the greater curve of the stomach and I'm putting this stitch down on the distal esophagus on the level of the gastroesophageal junction. We're going off on the side of the esophagus here. Good bite, and I don't want to make the vessel bleed, so we'll go hopefully around that. Let me see this here, ok. Can I have the…I'll tighten this, and as soon as I tighten this I'll have the bougie.

DR. ROTH

As you can see, as Dr. Park creates the wrap, he's wrapping the esophagus, or the upper portion of the stomach, or the fundis, around the esophagus. And, this operation was initially described by a man by the name of Rudolph Nissen back in the 1950's. This was done through an open surgical approach. Although, there were significant problems with it which really let to it's widespread acceptance. And, one of the biggest problems with this operations was dysphasia. When I say dysphasia, that means difficulty swallowing. When this operation was first described, people who did the operation made the valve very long, in addition they made it very tight. As a result of having that long and tight trap, it kept the acid in the stomach, but at the same time patients had a difficult time getting food bowls down to the stomach. As a result the operation has evolved over the past few decades. And, now we do the operation in a short and floppy fashion. By that I mean keeping the length of the wrap short, usually in the order of two to three centimeters. And, we do it over a very large dilator or bougie to make sure that the valve is tight enough but not too tight so they don't have those types of post operative problems. The laparoscopic operation was actually described in 1991. So, over the past ten years or so we've evolved from a maximum invasive open operation with a significant post operative problems and recovery to an outpatient operation which is very effective at controlling reflux disease. As you look at this cartoon on the screen you can actually see what is happening. The upper portion of the stomach, or the fundis, is being wrapped around the lower portion of the esophagus to recreate the valve.

DR. PARK

Scott, if you can hear me, this is really going to be our last stitch and we're pretty much done here. So, this is going to be stitched down to the G junction. And, I'm going to bring a little bit more of the fundis through and around. And, this is what our, wrapping these, so this is what the wrap is going to look like. This patient is going to feel an immediate, notice an immediate difference in her swallowing. She's going to have a very effective valve here, immediately. One of the things we didn't talk much about is that we have a real, one of the viewers asked about is everybody a candidate for surgery? And, part of the pre-op assessment process is to spend a lot of time working the patient up, talking about options. And, it's not an immediate jump to surgery by any means. And, then talk about, it's very much a team effort. Talking about what preoperative expectation are from the standpoint of what we do. But, also from the point of what the patient has to do. And, we really want to make sure that the patients are going to be compliant. We put them on a progressive diet. So, tomorrow the patient will go on clear liquids and we've had a lot of teaching. We give folks a lot of things to read about. There's quite a program that we have. But, this patient will go on clear liquids and will then graduate over the next couple of weeks to puddings and milkshakes and stuff up to a regular diet. Now, here I can easily get, so but what we have now, she's going to notice a real difference. And, she's not going to reflux now because we've constituted her external sphincter right here. So, here are the diaphragmatic crura, reapproximated. We reconstituted the external sphincter right there, and now we've created another larynx sphincter. And this is fundoplication, and you can see the stomach lying in place right here. Our three stitch wrap I always like to check afterwards, even though I size this repair over a bougie I can easily get my instrument along side, that means it's not too tight. I've already sized what can come down through the esophagus, and so I'm pretty happy with that. That's really what we do. And, I want to show an external view so we can show how our hands have been working here. So, I'm working towards the screen, and that's the image that you see, and that's the image the I've been seeing. We have Dr. McKinley on my left and Keara on my right, and Mary's in the background there trying to hide. And, the overview here, why don't you give the overview so we can show the trocars. So, Dr. McKinley's on what we call the liver retractor, helps elevate the liver. I work with my two hands, my left and this is my right hand. These are the trocars that we're talking about. And, these are the things that we introduce our instruments and our sutures and all sorts of things through our trocars. Our camera's in a trocar. Here's our camera. The camera is right here on the end of a long rod lens, and this is only a five millimeter rod lens. It used to be much bigger and now we use a small lens. We can make a really small incision on the patient. And, this is another trocar off to the side that we use to help with retraction. And, once we take these instruments out, they will leave very small incisions. And, when we see them in the clinic post-op, they're like freckles and they're almost invisible. So, patients don't come with cosmetic outcomes, which is one of their primary concerns. But, this can really be a very cosmetic procedure, and we can hide these incisions well, and patients can go to the beach that summer.

DR. ROTH

I'd like to remind everyone that you can send us an email, and we'll be happy to answer your questions. We just received a question regarding this operation being performed for recurrent hernias or sliding hernias. So, can this operation be performed for patients with recurrent hiatal hernias. I assume that means a patient that's had this operation once before.

DR. PARK

Yeah, absolutely. We tend to see some of the more complex cases here. And, we'll not infrequently be doing a reoperative procedure for patients that may have had a procedure, it may have failed or the hernia may have come back. And, probably 95 percent of the time we're successful, even on the redo's, doing them laparoscopically. So, it's a procedure that kind of takes a fair bit of experience with it. And, we just tend to see a lot of those types of cases.

DR. ROTH

We have another question asking us if we ever have to go to the open surgery because of too much scar tissue from previous surgery?

DR. PARK

Yeah, indeed. Probably, in our case, it's about five percent of the time that we need to do that. Again, as with anything, the more you do something, the better you get at it. And, so we tend to see a lot of the more hostile abdomens. And, by that I mean the multipally operated on abdomens. And, you learn kind of the tricks and the techniques to gain entry to those kind of abdomens. And, so there's still a portion, there's still a small proportion that we just can't get into. And, I'd say that's probably only five percent of the cases.

DR. ROTH

We have a question asking us how effective this operation is at controlling reflux? I actually have some stats here that show how effective this operation is. A study looking at the open operation found that it was, most patients, or over 90 percent of patients were symptom free at long term follow up following openness in fundoplication. A more recent study preformed looking at laparoscopic patients found that nearly 96 percent of those patients were symptom free long term, or at least in the intermediate term following laparoscopic fundoplication. One of the significant side effects that can occur after this operation is dysphasia. And, we talked briefly about that before, and that means difficulty swallowing. And, for that reason we put all patients on a progressive diet following the operation. They start on a clear liquid diet and they slowly advance their diet back to solids over a period of several weeks. We do that to allow time for the swelling of the valve to resolve. Additionally they need to retrain their esophagus to swallow food through this newly created valve. So, most patients will have some difficulty swallowing in the short term. However, over a period of several weeks to several months, almost all of that improves, and most patients are swallowing normally within four to six weeks following the operation. Additionally, when we talk about patients who are good candidates for this operation, we know that patients that have had pre-operative testing that show that the reflux, and the symptoms that's truly related to acid have the best outcomes. So, preoperatively, one of the tests that we frequently will do is called the pH probe, and that test involves replacing a small tube or probe down through the nose and into the esophagus. And, through that probe, we're actually able to measure the level of acidity in the esophagus. Additionally we're able to correlate the patient's symptoms with the level of the acidity in the esophagus. We know that patients that have symptoms that correlate with the acid in the esophagus have excellent results with the operation. Additionally, patients with typical symptoms of reflux, specifically the heartburn, regurgitation have the best outcomes after the surgery. We also know that patients with

laryngeal reflux, which Dr. Castellanos is an expert in, also benefit in the operation. And, I want to give Dr. Castellanos and opportunity to discuss laryngeal reflux, as well.

DR. CASTELLANOS

Thank you, Scott. Certainly the patients with laryngeal esophageal reflux disease or LERD, I'll call if LERD from this point just because it's hard to say all those words as they run together. Those patients need particular attention and are really the beneficiaries of this consortium of conditions that we have here at the center for voice swallowing and esophageal disorders at the University of Maryland. That is to say those patients require the most careful attention. Both to their symptom profile and the results of what we call an empiric trial therapy. Just as you were saying when you could establish the relationship of acidity to symptoms you're most likely to be getting a patient who is going to be successfully treated surgically. The same is true for patients who have the atypical symptoms or the LERD symptoms and respond well to an aggressive program of acid suppression and anti-reflux measures. And, I will say aggressive in comparison to that which is usually necessary to control heartburn or water brash, or other symptoms that are considered more in the realm of typical GERD. Aggressive in that they need twice daily proton pump inhibitor medication to suppress their acidity. They may even need more than that. And, they will need a very rigorous program of anti reflux measures that certainly are in kind like the program for traditional GERD problems, but even more extreme. And, some of the problems that we have in keeping patients compliant include the fact that to really know if this is the right disease and if it is being treated appropriately, they have to do things like giving up coffee for a time, give up carbonated sodas, refrain from eating chocolate, ooh, that's a tough one. But, from the perspective from the benefit they can stand to gain by being actually diagnosed, those are the ones who are going to be able to be certain are going to be treated for the right disease. And, then when we have the results of further diagnostic tests, if they are among the group that need to be considered for surgery, well then we'll have even more confidence. You will have even more confidence when they come to see you that they are likely to be good candidates.

DR. ROTH

One of the questions as regarding the cost effectiveness of this operation. We know that many patients with reflux symptoms will require medications, lifelong. Their symptoms are not short lived and this is a life long disease process. So, for many patients who are well controlled with medical therapy, we'll offer this operation so they can be free of medications. From a cost effectiveness standpoint, we know that this is an excellent operation. Typically to the point at which the medications cost the same as having the operation in the vicinity of three to four years. And, this study done in the military in 1999 on this slide actually demonstrates the point of cost effectiveness of this operation. Additionally as far as long term symptom control, you can see that the surgery is actually more effective than proton pump inhibitors. Typically over a period of time patients require escalating doses of their proton pump inhibitor to control their symptoms. Although some patients may have breakthrough in the long term with anti reflux surgery, meaning they may require an intermittent does of proton pump inhibitor. The degree of reflux control is far superior than medications alone. We have a question for you, Dr. Park. This is a comical question. It says: On TV they operate with the music blasting. They'd like to know what type of music you listen to while you're operating.

DR. PARK

Can you hear me? Can you hear me, Scott? Well, yeah, I like to listen to classical stuff, but that usually doesn't go down too well with the rest of the OR team. We got to have something a little more upbeat. So, I take a lot of abuse about that, but, so we have to kind of, it's ongoing, it's a sore topic. It's an ongoing issue.

DR. CASTELLANOS

If I may say something more about LERD patients. In all likelihood, if your inclination taking care of LERD patients, these are not going to be the ones that come to you with the obvious diagnosis of complications of GERD. Rather more likely than not, they don't have heartburn and so as a result they may be complaining of throat symptoms contributing to problems like post nasal drip associated with allergies; perhaps even problems with primary reactive airway disease, or asthma. And, yet the traditional treatments for those conditions don't seem to be working. If you're a patient and you have these problems and your doctors have been trying to bring these symptoms under control and scratching their heads about why this isn't helping, it may be because you have the other conditions. There is some basis for the diagnoses, but the cofactor of LERD may be making it difficult for you to notice a significant improvement in your symptom profile. So, it's worth your while to consider LERD when you're dealing with symptoms of throat complaints that are just not responding to the treatment regiments that would seem should be functional. It is worth your while to think about this inclination and to ask about it as a patient.

DR. ROTH

We have a question regarding driving after surgery. Typically, patients after laparoscopic operation are able to return to fairly normal activites after approximately a week. We usually like to see them back at the office before they resume driving. So, we'll typically have a post operative visit early in the post operative period to ensure that they recover. One of the primary restriction after laparoscopic operation is similar to the open operations. And, that's lifting requirements. Although the incisions are small and the pain from the operation is dramatically diminished, the incisions still need to heal. And, we say that incisions heal side to side rather than top to bottom. So, a short incision actually requires the same amount of time to heal as a long incision. So, while the recovery's improved, the return to function has improved, those incisions still take approximately six weeks to gain strength that's strong enough to endure normal lifting pressure. So, one of the restrictions following the operation is to minimize lifting activities for approximately six weeks.

DR. CASTELLANOS

If I can mention some of the other disease processes that are now known in a period of research to be at least related to problems with LERD. I think it's important to get the information out that problems with what's called obstructive sleep apnea, or the cyclic inability to breathe in patients who snore. The relationship between LERD or the complete upflow of gastric acidity in enzymes into the upper throat and obstructive sleep apnea has been strongly implicated now in the literature. That is to say the patients who have extra esophageal reflux will get a thickening of those tissues such that they are more prone to obstruct and as a result will have worsening

obstructive sleep apnea, which of course, in the realm of the typical GERD patient, the bigger that you are, the more likely you are to have obstructive sleep apnea. Well, the bigger that you are, the more likely you are to reflux, also. And, those two processes will tend to mount on each other such that one will make the other worse progressively until you get an extreme level of debility. If you have a group of patients that you are treating for obstructive sleep apnea, even if they are responding well to CPAP, that is the pressure mask that patients can sleep with, think about the possibility that they can be made better or that the ones that are not responding to CPAP can be brought to respond by empiric treatment, by just an empiric trial of acid suppression and anti-reflux measures. It's very important to be thinking broadly and using the old phrase of out of the box to include the possibility that LERD may be a cofactor in airway disease such as obstructive sleep apnea.

DR. ROTH

I just want to sum up as our operation is concluded that laparoscopic Nissen fundoplication is the standard in care for the long term treatment of gastroesophageal reflux disease. The results with the laparoscopic operation are better than the medical therapy and there are really few complications that occur in the post operative period. There are new and innovative surgical devices and therapies that are being created, but they really need to be compared with the laparoscopic anti-reflux operation and be proven to be equally as effective if not better prior to being accepted as the standard of care. I'd like to draw on Dr. Adrian Park for any additional concluding remarks.

DR. PARK

Yeah, Scott, I'm just showing folks one last view. We're going to close now, and I'll show you what the trocar looks like and how it looks when we're coming out. But, this is the final view just to reiterate, and people have seen my schematics. This is the esophagus, new sphincter that we've created, closed the small hiatal hernia that she had. So, now if you could show the outside view we will show you, show the abdominal view if you would. There we go, so now we're going to take the camera out and then we take these instruments out, take this instrument out. And, the next steps will be, we're just going to simply take the ports out and close up these very small incisions. And, the bougie can come out, absolutely, please. So, again that's hopefully, I'm quite confident that this patient will be very well served with this anti-reflux procedure.

DR. ROTH

And, I want to emphasize that if anyone has any additional questions following this live broadcast, they certainly can contact us by means of the web and our email and we'll be happy to answer any additional questions. We'll be happy to see anyone in consultation at the voice and swallowing and esophageal disorder clinic at the University of Maryland. Any, concluding remarks, Dr. Castellanos?

DR. CASTELLANOS

Well, to emphasize one of the things that Adrian said earlier that this is not an operation to do on a rare occasion. This is an operation as a clinician who refers patients for this kind of care that is first of all done by expertly trained surgeons chosen in a circumspect manner to carefully decide

which patients are candidates and those who are not. And, then done in a manner like that's shown by Dr. Park. Quick, but certainly in a very precise manner with a careful attention to avoiding the post operative complication potential that usually is not a dangerous problem, that is the dysphasia, or difficulty to swallow. But, certainly can be a nuisance for patients to get through. As a result for inclination I depend on these colleagues who are working with me at the center for voice, swallowing, and esophageal disorders here at Maryland. And, regardless if you live in our vicinity or not, this is the kind of center that you want to be seen at, or want to be referring your patients to, to get the best possible care.

DR. ROTH

On behalf of the University of Maryland Medical Center, the Department of Surgery, the Division of Otolaryngology, the Division of General Surgery here at the University of Maryland, we'd like to thank all of our viewer for tuning in, and have a good night.

SPEAKER

This has been a laparoscopic Nissen Fundoplication preformed live at University of Maryland Medical Center, in Baltimore, Maryland. The presentation is a continuing medical education program. For those viewers who registered for CME, click on the slide in the window to your right to take the post-test now.