

Treatment of Acid Reflux Minimally Invasive Procedure Shortens Hospital Stay for Patients May 21, 2009

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Hello and welcome. We are coming to live from the state-of-the-art medical suite at Shawnee Mission Medical Center in Merriam, Kansas. I’m Dr. Glenn Dale. I’m your host for today’s program. Joining me in the OR is Mr. Joseph Petelin. Dr. Petelin will be performing a Laparoscopic Nissen Fundoplication to greet gastroesophageal reflux, also known as “GERD.” We will be joining Dr. Petelin in just a moment. But before we get started, I just wanted to mention that this is an interactive webcast; meaning, you may send us your questions about the procedure as it is happening. To send us your questions now or any time during the program, just click the “Ask a question” button on your webcast screen.

Also during the program I will be twittering from the OR. You will see the messages on you webcast screen in real-time as I post them. There you will see some of my commentary during Dr. Petelin’s explanation of the surgery. Please join us for the Shawnee Mission Medical Center’s next live surgical webcast, which will feature open and endovascular repair of aortic aneurysms. Watch the Shawnee Mission Medical Center website for an announcement and date for this program. Now let me turn things over to Dr. Petelin. Dr. Petelin, can you tell us where you are in the surgery?

Thank you, Dr. Dale. We’re performing a laparoscopic Nissen fundoplication on this patient. And before getting into all the anatomy and all the details of what we’re doing, I’d like to introduce the staff that is helping me. My first assistant and associate, Dr. Teresa McCauley, is here to my right. She is the current Surgic’s minimally invasive surgery fellow, just about to complete a year-long mission to become more proficient and an expert in minimally invasive advanced laparoscopic surgery. The nurse anesthetist at the head of the table, which you can’t maybe can’t see right now, is Susan Wallace. She’s providing the help we need upstairs to keep the patient nice and relaxed. To my left, Miss Sheri Vetalli -- Mrs. Sheri Vetalli, is our scrub nurse. Circulating in the room of Sue Marty, a nurse, and Robin Headstrom, our Surgic’s associate as well.

So what we have done here is we’ve started the dissection. We have placed five ports in the abdomen. There’s a ten-millimeter port just above the umbilicus. That’s this one here. And through that we have a scope that allows you to see what’s going on inside the abdomen. We then have a series of five-millimeter ports on the surface here, here, here, and here, so the patient’s head is up this direction here. Now on the inside, the area that we have to fix is up in here. And as you can see, we’ve started the dissection.

This way up here, where this white stuff is, that’s part of the diagram. You can see the heart pulsating just above that. And then the esophagus is just down in this area. That area there where you see this little bit of a gap, that’s called a “hiatal hernia,” and we’ll show you the posterior aspect of that as well. Down here is this J-shaped organ that we call the stomach, obviously. And then you can see that we have lifted part of the liver out of the way from this area. Way over here in the back, you can’t see it, but the spleen is located over in that direction.

So what we need to do is this patient has a defective valve here that we need to repair. This operation doesn’t repair the internal valve because we don’t have a good way of doing that at this

point. But what we do is create an external valve to help stop the amount of reflux. And Dr. Dale is going to explain that to you in a little bit more detail with a diagram. But the long story short is that we're going to take this part of the stomach and we're going to wrap it around the backside of the esophagus here and create a wrap, kind of like a hotdog in a bun.

Now I'm going to show you just a little more about the hiatus. This opening here is called the "hiatus" and the "diaphragm." This is diagram. This is the diagram. We call these two things the "crura" of the diaphragm on the right side. This gap here shouldn't really exist. So he has what we would call an average or maybe a small-sized hiatal hernia. And the hernia just means that he's got a hernia bigger than it should be at the hiatus. We're going to pull that back together as part of this operation. Once we free up the stomach over here, we're going to bring that back around all the way onto the other side of the esophagus, up in this area here to make this wrap like a hotdog on a bun, and that's going to act like an external valve.

Now you'll see that we've got a couple of openings here. This here is the hepatic branch, the branch of the vagus nerve that goes over toward the liver. The main branches of the vagus nerve, you can barely see a white line here. It comes down and helps innervate the stomach. Now to provide a little bit better explanation of all these things we just showed you, Dr. Dale can show you, with diagrams, what the problem is and what the anatomy looks like from a diagrammatic point of view. Dr. Dale.

Thank you. Dr. Petelin. This is a diagram of what Dr. Petelin was just describing. You can see here the stomach. This is an abnormal picture, the diaphragm here to the sides. The stomach has migrated into the chest. The normal lower esophageal sphincter would be at this level, which should be down below the diaphragm, and you can see that this is moved into the chest, and therefore, there's no actual valve, and that, of course, causes the reflux. There's kind of a broad spectrum of reflux a patient can have because their valve can be at different stages.

This is a grade of the valves that are typically seen. A grade one, a mild grade one is a valve that's loose here. This is a picture of a gastroscope that's going down the esophagus and put back looking at itself, and this is that valve that you would normally like to have a little bit more confident. It's not too loose here, but it's loose enough that we call it a "mild gastroesophageal reflux," or would cause a mild gastroesophageal reflux.

This picture here is a graph of the valve pressure, or of the actual valve. This is a grade two, where you can see it's a little bit looser around the gastroscope. And a grade three, there's actually a space here between the gastroscope and the edge of that valve. Again, this is a picture looking at that valve. And then a grade four, where there's a huge gap all the way around the gastroscope, and a much worse problem.

So Dr. Dale, you might go through an explanation of a little bit more about what GERD is, or gastroesophageal reflux disease, and how the abnormalities in the anatomy help cause that problem and what patients might wind up in surgery. Obviously, all of us, especially during the past year, have had a fair amount of heartburn with the economy being the way it is, but not all of us needs to have an operation. So why don't you explain how patients get worked up and how we wind up in the operating room with some of them.

Sure. You don't have any quick fixes for the economy, do you?

Well, I can't tell you about them.

Symptoms typically patients will have a complaint of burning in their chest or maybe in their mid upper gastric region. They can also have reflux of food that they can taste back up into their mouth. Those are typically more common descriptions the patients will describe. Sometimes though, it can be a much worse problem where they will bring that fluid up into their lungs. They don't always realize that that's what happening. Sometimes the patients just may have a cough.

They may even have asthma. About 70-percent of patients with adult onset asthma have occult GERD, and they're refluxing and don't realize it's going on. Those, of course, have a much more serious problem that can occur. They end up getting treated for their asthma, and they can be on multiple inhalers and even steroids to treat that problem.

The workup for this is typically done by a gastroenterologist. The family practitioner or primary care physician will frequently send them to a gastroenterologist if they're not really responding to typical medications like H2 blockers or proton pump inhibitors. And they'll do an endoscopy -- like we were showing before -- inside the patient's stomach and can look back and see the hernia. They can also see the damage that's done in the esophagus. Sometimes they may have to do some additional disease workup just to make sure that there aren't other diseases. They might have to do an upper GI series and sometimes a 24-hour PH study.

Typically, medical treatments can be just elevating the head of the bed. Frequently the patient may just get mild with elevating the end of their bed and trying not to lay down three, four hours after they have eaten, try not to eat large meals, getting them to eat multiple small meals, maybe six meals a day. There are certain foods that will tend to flare this up -- fats. Peppermint can make that valve relax. So can alcohol. So we try to get them to limit those things. Losing weight will have a significant impact, especially on males. And then, of course, the typical drugs that are used, the proton inhibitors and H2 blockers are frequently used.

So how does a patient wind up here in the operating room? I guess, as you said, they go to their primary doc, and he says, "Gosh, you know, let's try something to decrease the amount of acid that's in your stomach," and then after a while he realizes and the patient realizes, "You know, I'm just not getting a whole lot better." So they go and see the gastroenterologist. And you might describe what sort of test the gastroenterologist would initiate for the patient.

Well the patients may present, as I said before, with different types of symptoms, cough, or asthma-type symptoms. There are other types of problems that can cause that besides reflux, and so they're going to want to know if that's actually what's causing the problem. And so a 24-hour PH is commonly done. That's a study performed by Dr. Tom DeMeester originally in which a patient has a tube placed down their esophagus, and they carry a small -- a computer chip on their belt, and when they reflux, that reflux is recorded on that tube and in that chip. And the patient writes down symptoms. And when they come back in, that can be interpreted by the gastroenterologist and they can correlate that diary that the patient is writing with those symptoms, and we can show that their symptoms are actually coming from that reflux.

Recently they've got more sophisticated methods where they don't even have to have a tube down their nose. They have a tiny capsule that gastroenterologists can clip into the esophagus called a "bravo capsule," and it sends it by radio frequency out to a computer chip on their belt.

Okay. So the patient winds up with the study, and the gastroenterologist tries the various methods that you have already described. And then if the patient is not improving as much as the gastroenterologist and the patient both would want, then they wind up being sent to a surgeon in many cases, and so when that happens we've got a variety of options for the patient. As the viewers know, we have called this a "laparoscopic Nissen fundoplication."

The laparoscopic means that we're using a scope inside the lap to do the operation. But how did the thing get the name "Nissen"? It's not an automobile. It's not a Nissan. It's got the name from the guy that developed it. And this operation was actually developed in the 1950s by a surgeon named Rudolf Nissen in Europe. But this isn't the only operation. This operation is probably the most popular operation worldwide to work on this problem of reflux. But there are other options as well, Dr. Dale. And you might just explain a few of those to the audience so they get a feel for the other options available.

Sure. Thank you. Certainly the full wrap, as you said is Nissen fundoplication, and a Rossetti repair is very similar to Nissen. They are just not taking down the short gastric, which you will be showing shortly, I'm sure. Partial wrap is a Belsey Mark IV or a Toupee or a Lind procedure, and that's where it does not actually wrap all the way around the junction. And then a Hill gastropexy is a procedure where the stomach is just pexed out onto the immediate arcuate ligament in the abdomen, recreating that valve. There are also some alternate therapies, some endoscopic therapies that are coming up that are quite interesting.

I'd like to show you just a couple of pictures here. Far left we have a typical standard Nissen fundoplication, and Dr. Petelin will be showing you that completed shortly. And in the middle is a Belsey Mark IV procedure. And the far right is a Hill procedure. Again, this is the stomach, the esophagus, and the diagram.

And one of those methods that I was discussing earlier, the endoscopic repair that has become available, I have seen this in reports from Europe. It's a transoral incision. It's an incisionless fundoplication, I'm sorry, called the "Esophyx procedure." I'm not very familiar with this, but I understand it is done with an endoscope, and the patients don't actually have to have a surgery. Do you have much knowledge with this, Dr. Petelin?

Yes. We've had some early experience with this procedure called the "TIF" procedure, T-I-F, standing for Transoral, meaning through the mouth, Incisionless, there's no incisions on the abdomen, and then Fundoplication. And what it does is it creates a valve very similar to what we're creating here, only without having to do it laparoscopically. Now we have made tremendous strides as a surgical community throughout the world in converting this operation that we're doing now, this Nissen fundoplication that we're doing with these small punning sure sites here. It used to be done through about a ten-inch incision up and down the abdomen, and the people in Belgium were able to show us how we can do this thing laparoscopically, so that's what we're doing, and that's a huge stride. And that basically is the standard procedure with fantastic results.

Basically 80 to 90 percent of the people that have this Nissen fundoplication have significant relief of their problem. What the TIF procedure does, if we can go back to that slide for a second, is the TIF procedure takes an endoscope and we place it through the mouth. It's the black curved J-shape, the reverse J-shape that you see there, that's the scope that the gastroenterologist does to do your upper endoscopy, and then the device that it is inserted through is this device called the "Esophyx." This has been done in Europe for over two years now, and the results are very promising. They look very similar to the results that we get with a Nissen. But, again, as you can see, there wouldn't be any incisions on the patient. So it's one of those procedures that I think is what we would call an "over the horizon," and the horizon is obviously coming to us very quickly. I think it's going to offer another option for the patients that don't have a huge hiatal hernia and that fit certain other criteria. So I think there's tremendous opportunity as we advance.

The Nissen that we're doing now, it is definitely the state-of-the-art, and it has caused significant improvement for patients. And instead of being in the hospital for seven days, they usually just stay overnight. So, again, that's just one of the things, the research continues to improve with those sorts of things.

So we're back looking inside the abdomen now. And I might just demonstrate things once again. Dr. McCauley has this curved retractor that's going in. It's behind the stomach and behind the esophagus. The esophagus is up here, the stomach is down here, and so this device is lifting this up. And you can see we've done a little bit of work since we last showed you all this. Again, this is the right and left crura of the right side of the diagram. The esophagus is up here. This is a window that we've made back behind the stomach and the esophagus. And that's going to allow us to take the fundus, as we have shown here, and bring that around.

Now in order to do that without having too much tension on it, there are vessels that go between the stomach and the spleen. The spleen, you're starting to see it, it's back here in this section. It's the purple thing back here. We've started to free up, and we have almost got it completely free, the stomach from that area. The vessels that go from the spleen to the stomach in that region are called the short gastric vessels, and as Dr. Dale pointed out earlier, the big difference between the Nissen procedure and the Rossetti procedure is that with the Nissen you do take down those short gastric vessels, "taking down," meaning that we're just dividing those so that the fundus will be more mobile. And if we have done that well enough, and if I can show you under here, if we can get back in this area behind the stomach that we call the "lesser sack," I can show you what we did.

For any surgeons or surgeon residents that are watching this, this is an interesting way to get to the short gastric vessels. Instead of going over the top up here, we can come back through this little window back here and raise the stomach up, and you can see that we've taken all of these short gastric vessels down so -- hold that for a second -- so the spleen is way back here. We have freed up all of this fundus up here in, so it's nice and mobile at this point. So we should be able to bring this part under the esophagus, back over here, and create the wrap up in this area.

So that's -- you can either take the short gastric vessels down in that fashion, or what is a little bit more common for people to do is to take them down from the front-end here. And it's basically surgeon preference. This retrogastric approach was actually taught to me by Bernard DelleMagne who is -- he and his team in the Belgium were the first to do this operation laparoscopically.

So before we do that wrap, and we're just about ready to do the wrap, we want to repair the hiatus, so what we're going to do is put some stitches between here and here to help snug up that hiatus. That's one aspect of the procedure. The other goal of the procedure, which you can see we've already done, is the esophagus here, the swallowing tube; we want that to be reduced back into the abdomen. With a hiatal hernia, this area right here where the esophagus meets the stomach, that wants to scoot up into the area up above the diaphragm and that contributes to the reflux, so we want to bring that down. We've done that, we've created this posterior window. We've mobilized the stomach, the fundus of the stomach here. Now we need to repair that hiatal hernia with some suture, and then bring that stomach around and make our wrap. So the next thing we'll be doing here is creating the hiatal hernia repair.

Dr. Petelin, we've got a few questions from the audience. Would you like to take some here?

Sure. And if I can't answer them, Dr. McCauley will be able to answer them.

A gentleman here from Colorado says, "I see steam coming off the scaffold when the surgeon makes a cut. Is he using one of those ultrasonic scaffolds?"

No. In fact I can explain this device. This device is what we call a bipolar cautery unit, and as you can see, there's -- just one second here -- as you can see there's a handle with a purple button back here, and what we do is bring this into the tissue and clamp it, and then we press this, and it basically sends an electric current between these two tips, and it cauterizes that part of the vessel. It allows us to take the vessels down without having to put clips on it. So this is called a "bipolar device."

Another device we have here, which is called a "unipolar" or "monopolar device," is this. The same type of energy is used for it, but instead of having two electrodes here at the end, there's just one electrode. So with this, through this small tip the current goes into the abdomen, touches the vessel that we want to cauterize, and the current travels there the abdomen, or through the patient's body to a big pad on the back, so this is a monopolar device, and it has a specific place to be used as well.

Now the question about using the ultrasound device is a good one. That is another excellent option for controlling vessels. The other option, obviously, is to use clips that are generated in a little device like this, where the clips come out like this. But either one of these two energy sources, the sonography, the ultrasound, or the bipolar have been tremendous uses. Now we're going to place this suture into the abdomen through this port here, and we're going to make our hiatal hernia repair.

For the young surgeons watching, you can see that we've placed that in the abdomen. In order to avoid spearing something with that suture, if you try to keep your device parallel to the abdominal wall, you're much less likely to cause any injury. So then once we get inside we just have to pick up the needle and do our repair. And we're going to put a series of sutures in here that we call "mattress sutures." So we'll sew that up back behind this. And let's see, let's pull this back. That's perfect just like that. So we'll come in under here through the right crus. Bring the needle out. We'll set that there for a second, and pull much more of the suture back through here.

And for the size of hernia that this gentleman has, it's not really all that large a hernia, but it's large enough that it needs repaired. He's only going to probably need two of these types of mattress sutures to close that defect up enough. But we'll be able to test that as we get it repaired. So we just zoom back in here, put the other suture through that side of the diagram, and then the next step will be to come back the other direction. I can tell you when you do this in an open fashion, when you make a seven-inch incision, seeing clear down here as much as you can see with this scope is never as clear as you're seeing it right now. The magnification just makes this such a better view for the surgeon.

Now some people will use pledgets, and again for the non-surgical audience, pledgets can be made of a number of different types of material. Basically it's a piece of cloth that we use to buttress the sutures as they go through the tissue. Now most of the time I prefer not to use the pledgets unless there's a real need for them. And in this particular patient, I think his tissue is strong enough that he doesn't need the pledgets. But you may see some surgeons use pledgets to reinforce this.

A couple more questions here, Dr. Petelin. Patients ask, they understand that with the fundoplication they cannot belch or vomit. "Isn't this a major concern?"

Well I'm going to let you take a good part of that. But as you know, that's not necessarily the case. And, in fact, most patients can belch and even have emesis or throw up if they need to with this. And that's the trick of making the wrap tight enough but not too tight. You might just expand on that a little bit, Dr. Dale.

Sure. That is the art of surgery, and that's certainly a problem that can occur. There are certain tricks that we teach patients. But at least 90, 95 percent are able to belch. If they can't belch, and sometimes a lot of them can't belch immediately after surgery just from edema, that usually resolves. But if they can't, there are some tricks that we try to have them do. We try to decrease their air intake, number one, so that they don't have bloating. And there are certainly things that increase that problem, carbonated drinks. The carbonation warms up in the stomach and will kind of make them bloat like a toad, and they'll be quite upset with that. They can also chew gum, anything that has them swallow small amounts of material will make them swallow air, so gum, or sucking on candy; sucking on a straw, that first part that goes down that they swallow is air, and that can cause them to get gas bloat. So we try to get them from reframe from taking small sips or sips of anything.

If they do get sick and they can't burp and they're nauseated, it can kind of create kind of a vicious cycle where they can get nausea that makes them make more saliva and they swallow more and they can pump air, so there's a trick we have them do to stop that. If they'll take a

pencil and put it between their teeth and actually separate their teeth, then they can't swallow, and instead of swallowing, when their mouth fills up with saliva they just kind of expectorate into a cup, and act like they're chewing tobacco there for a couple of hours, and that gives them time for their stomach to empty out, and that will pass. And usually after a few times of experiencing that, then they get used to that trick and they try not to swallow air and it quits being an issue. But like he said, 90 percent of them really don't have that issue.

So you can see that we've tightened that up a bit. We're going to put -- I think one more suture is going to tighten that up enough that we won't have to do any more than that. So we'll get one more oaf those. And then after we get that part done, we're going to bring the stomach back around there and create the wrap. When we make the wrap, we usually make it about two centimeter or so long. And two-and-a-half centimeters is equal to about one inch. So the wrap will be just about an inch long. And that usually creates enough of a high-pressure zone to help protect against the reflux but still allow food to get into the stomach.

And I don't know, Dr. Dale, how much you went through the pressure curves on the one slide, but our goal is to try to get the patient as closely as possible back to normal pressure curve. And you can see, if that slide comes up, what the normal looks like and what the various options are for making that better.

Sure. Thank you, Joe. This is a normal picture here. This is a pressure curve, normal GE junction and esophagus, the Z line going across here. If someone has GERD, baseline, the pressure tracing looks like this. This really changed quite a bit. Now that TIF procedure that he was talking about earlier when he first started, that was called an "ELF" procedure. It had a pressure tracing like this, and as that has progressed so TIF one and now to a TIF two, you see that they're getting a pressure zone that's very close to normal anatomy. Looking at the Nissen that we're constructing now, you'll see that that's kind of one of the golden standards for treatment is it so closely reproduces the normal pressure zone.

Great. Thanks. Again, where that pressure curve is, they determine that by probes around that high pressure zone. On that graph that he showed where it talked about HPZ, that's the high pressure zone at the bottom end of the esophagus that helps prevent reflux. And so the goal of all these procedures is try to make a high-pressure zone very similar to what normal would be, and by doing so you decrease the opportunity for reflux.

We've got another question here from the audience. This looks like from a doctor in the audience. He would like to know what the number of the needle is that you're using at this time.

Well, I'm going to have to depend on the exact number from Mrs. Vetalli. The type of suture is called "Ethibond." This is a number one -- I'm sorry. It's a zero Ethibond suture. It's a non-absorbable suture, which means it's going to stay inside forever.

Okay.

And what's the model number for the needle, Sherri.

CT2

CT2. Thanks, Susan, sue. Sue Marty, our circulator, is telling me that the model number on the needle is a CT2. Each company that makes sutures has their own sets of designations, but basically you can see the curve on this needle is probably about a diameter of about three quarters of an inch. Okay. So you can see, and I'll irrigate that off a little bit, but you can see that that hiatus looks a lot different than it did about ten minutes ago. I'll just wash off the camera here for a second, and that should become a little bit clearer for all of us. Okay.

So there is hiatus. You can see our two sutures. There's one here and then one more up just a little higher. Okay. So one there and one way down here. It's a little bit out of view at this point. But that closed the hiatus up quite well.

Now our next job, as I told you, is to bring the fundus of the stomach around, and I just need to sneak back in there with the camera to be able to do that. So we're going to try to grasp the fundus from the backside here and bring it back through this area. Okay. Just relax for a minute. Uh-huh, you can take it out. This usually takes a little bit of negotiation to get the part of the stomach that we want out here. And so we'll bring that around. And we're going to test it. Some people call a "shoe shine" maneuver. But base clay what we want to do is make sure the stomach doesn't appear to be stretched or too tight when it's over here.

And as you can see, I just reached above this hepatic branch of the vagus nerve. So we're going to hold onto the stomach there. And Dr. McCauley is going to just press this down a little bit so you can see the -- you can't quite see it yet, but you will start to see the fundus of the stomach come back around. He doesn't have the most generous fundus, as it turns out, so we have to be careful about how snug we make this wrap. So the goal is to make enough pressure in the wrap but not too much. And we'll go ahead and take this guy out. Lets see if I can press down with this just a little bit more to show the fundus which is over -- the other part is over there so, again, he doesn't have the largest fundus in the world.

What I'm going to do is just pull this back just a little more. That's better. And then Dr. McCauley's just going to hold this up while we put a different type of suture in there. The other suture that we have in there is going to rest right here for a minute, and we'll take that out when we're at the end. This suture is a zero silk suture. Again, it's on about the same size of needle as the other, about three-quarters of an inch. And we're going to use that to create the wrap. And, again, as we mentioned earlier, we try to keep this instrument parallel to the abdominal wall and tack the suture in there.

Now a natural question is, "Well, how tight do you make the wrap?" And, again, a man that Dr. Dale mentioned earlier, Dr. Tom DeMeester, who is really one of the American pioneers in all of this type of surgery, suggests that we use something like a 60-French dilator, which is about the size of a hot dog. And that will be inserted into the esophagus by the anesthetist. And instead of using a 60, what I have found seems to work best for us is to use a 50-French dilator and then just make the wrap a little bit looser than it would otherwise be. So that helps us gauge how snug to make the wrap.

Now the way that I usually prefer to do this is to put the first suture in before that dilator goes into the stomach. So I'm going to ask Susan Wallace, our anesthetist, to take out the tube that's in the stomach. We have a suction tube in the stomach that was placed through the mouth. That's going to come out, and then she is going to advance the dilator from the mouth down to about the mid esophagus. And that's right around 23 to 25 centimeters from the teeth, so she's going to do that. And then after I get this first stitch in, we'll have her advance it all the way into the stomach, and we'll test to see if this stitch is too tight or too loose. Obviously if it's too tight, then we'll consider revising it.

After we get it in, then we'll -- you can see Dr. McCauley has just pulled the fundus up enough so that I can get the suture as high as I need to. So as you can see, it takes a real team effort to get all this done. There's a lot of people around me that are making this operation a lot easier to do than it otherwise would be. So we're going to bring -- ultimately bring this -- I'm sorry -- bring this suture here. At some point we'll bring it around. There it is. Okay. And we'll create that wrap and, again, that's the essence of the operation. Okay.

They just indicated to me that the dilator is at 25 centimeters. We're going to just leave it there for a few minutes, Susan. Okay. You can let go of that. And then Dr. McCauley is just going to

push that fat down a little bit so we don't get that trapped in here. And so this is the first stitch of this wrap, and you can see we're putting this wrap superior; that is, above that vagus nerve.

I'm sure somebody's going to ask the question of whether or not the suture has to go through the esophageal wall. And there's proponents of that and detractors from it. One of the potential advantages of it is to make sure that this wrap does not slip off the esophagus down onto the stomach, a so called "slip Nissen." The other way that I think you can ensure that is make sure the esophagus is down here into the abdomen, and then create the wrap superior to that vagus nerve. And that's what I prefer to do in most patients. That seems to work for us. In fact, we have not had any slip Nissens with that technique.

So we're getting a fair number of questions from the audience here. I'm trying to filter through this, and I apologize. I'm trying to slip one in if I can.

You're fine.

I'd like to know how you feel about the Stretta procedure. Does this cause irreparable permanent damage to the LES?

The Stretta procedure, as I understand it, and I have never done it and I have never ordered it for my patients, but basically it takes an energy probe and creates reaction in the bottom end of the esophagus that creates a high-pressure zone. The thing that I don't like about it is -- and I'm going to put a little stitch here. This one just a little into the esophageal wall. The thing I don't like about it is that I think it creates more scar, and I'm not really a proponent of it. Although I say that with full recognition of the fact that I've never done one and never ordered one for my patients. So I'm sure there are other people that have a different viewpoint from that.

There's also another question here about contraindications for laparoscopic Nissen funduplications, especially if they've had previous surgery before, fear of adhesions.

Well, as you know, there are absolute contraindications and then there are relative contraindications. Adhesions you can usually work through. It just depends a lot on the degree of adhesions. And the most important factor is surgeon experience. And that's why we have had the minimally-invasive surgery fellowship here for the last 18 years, where a surgeon such as Dr. McCauley, after being fully trained in our surgical residency spends a year in a program like this. And there are about a hundred of these programs around the country. Spends a year learning these more advanced techniques and hopefully the appropriate way to accomplish them. So in my perspective, the biggest contraindication would be in a patient that -- or in a patient in whom the surgeon doesn't have enough experience.

Susan, you can advance that dilator into the stomach. Just let me know every five centimeters as you come through. What we're doing is advancing that dilator, and it has a tapered tip to it, so we can see it as it comes through the esophageal gastric juncture here. We want to make sure there's not too much angulation, and then we size that with a wrap to that to make sure this wrap is loose enough around that dilator and that there's no angulation as it comes through.

Keep coming down. Okay. Keep coming. Keep coming. When you start to see a little bit of -- keep coming. Keep coming. You just saw the wrap slide there. You can leave it right there at 50. So now the dilator is in place and we're going to create the wrap, what we call "over the dilator." Probably another two stitches is going to be what we need to complete this.

So what we would like to have is what's called a "loose floppy Nissen," which means that this wrap is not too tight around the esophagus. And the way that this works as a relatively simple explanation is that when the pressure in the stomach increases enough to allow the potential for reflux up into the abdomen, it also increasing the pressure in the two parts of the wrap to act like a natural valve.

So the way that a patient ends up seeing a surgeon is usually after what we call a GI or gastroenterology workup and that allows them to come to us. And we at Shawnee Mission are blessed with a number of superb gastroenterologists. And you don't just walk into a surgeon's office as a patient and say, "I want a Nissen" or "I want a TIF" or whatever. You get a workup. And you need to, you know, talk with your gastroenterologist, and then your surgeon to find out the pros and cons like we have talked about earlier.

So, again, this is laparoscopic Nissen fundoplication. Again, as I say, I think one more suture is going to do it. You can start to see the wrap there. And, again, these are permanent sutures. They'll stay in. And after we get the next suture in and tied, we'll have the anesthetist once again pull the dilator back to the mid esophagus and then bring it in one more time to make sure that we don't have too much angulation on the wrap. Need to get a little better, if I can push that down here. Great. Thanks. So it's starting to look like that diagram Dr. Dale showed you earlier.

We have a couple more questions here if I can slip them in. I have a patient here that says they're experiencing reflux. "Which specialty doctor should I see first?"

Well that would be -- obviously it's good to talk to your primary care doctor so that he or she can determine how severe it is. And then you'll probably be placed on some kind of medication and probably be advised to undergo some of the lifestyle changes that would be helpful. And if the primary care physician doesn't feel you're making enough progress, then they would very likely send you to a gastroenterologist, and then the gastroenterologist, again, would decide how severe the reflux is and what sort of tests that you might need. And then again, patients are almost universally tried on antibiotics -- not antibiotics, antisecretory drugs.

Okay. You can let that go. Susan, would you once again pull the dilator back to the mid esophagus and then advance it again, and let me know every five centimeters past 25. And what we want to do is to make sure -- see how nice and loose and floppy this is? That's a nice wrap. Again, the esophagus, fundus of the stomach, this part of the stomach is called the "fundus." When we pull it together like this it's called a "plication." Okay. Go ahead and let me know every five centimeters. Come back into about 50.

30.

Uh-huh.

35.

Uh-huh.

40.

Uh-huh.

45.

Uh-huh. Keep coming.

50.

And go one more time to 55.

55.

Okay. So I think you could see on the video screen that the dilator came through nicely. It didn't flip up here and then come down. And you can see that we can raise that wrap off of it very easily. All right, Susan, you can take that dilator completely out.

Well, ladies and gentlemen, that is the essence of the procedure. The remainder of what we have to do now is take each of the ports out and sew everything up.

Joe, you made that look pretty easy.

I had a lot of help, a lot of great help. So what we're going to do is take this liver retractor out. And so these retractors are really kind of nice because you can see that the diameter of this retractor is only about five millimeters, which is smaller than a typical pencil, but yet by having all these little knuckles on it, we can make a nice retractor out of it without having to have a huge incision. So I think we've done pretty much everything we set out to do. We got the -- let's see if I can flip that up again. We got the esophageal gastric junction back down in the abdomen. We've created a wrap. We repaired the hiatal hernia back there, and that should give him a 90-plus percent chance of improving his symptoms.

I'm just going to suction out some of that irrigation fluid out there. And the total blood loss for this looks like it's about two thimbles full. The anesthesia people always like to know that. You see, just as a point of reference for the audience, you see those strands of things there and there and then up here you'll see another set, and on the left side. Those are the phrenic nerves. They make the diaphragm work, and you can see the heart up there. That's what when babies swallow too much air it causes them to have hiccups, and that's also what causes some people, if they have a really huge hiatal hernia, it can cause them to have some discomfort. So that is what we set out to do. Now we just have to close these wounds. The lights will stay off.

Well we're about out of time. I would like to thank our audience for joining us today for what I hope was an informative webcast. I'd also like to extend special thanks to our patient who agreed to have this procedure webcast today. Without his willingness and generosity, this program would not have been possible.

This has been a laparoscopic Nissen fundoplication to treat to treat gastroesophageal reflux live from Shawnee Mission in Merriam, Kansas. I'm Dr. Glenn Dale. F for Dr. Joseph Petelin and all of us here at Shawnee Mission Medical Center, good night.

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