



Weight Loss Surgery: Gastric Sleeve

Shawnee Mission Medical Center

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We are coming to you live from the state of our operating room at Shawnee Mission Medical Center in Merriam, Kansas. I'm Dr. Christopher Kowalski, I'm your host for today's program. Joining me in the OR table is Dr. Stanley Hoen. Dr. Hoen will be performing a minimally invasive laparoscopic procedure for weight loss called the gastric sleeve resection. Before we join Dr. Hoen in the operating room, I want to mention that over the next hour you may send all your questions about weight loss surgery. To send a question now or at any time during the program, just click the Ask A Question button on your webcast screen. You can also participate in this webcast through Twitter. To do so, just enter #smmc in a Twitter search bar. Finally, if you'd like to share this program with a friend or family member the program will be available on demand through this Web site later this evening.

Before we go into the ORR, I'd like to explain the laparoscopic (inaudible). On your screen is a picture of a stomach that has actually had a laparoscopic gastric (inaudible) performed. If you follow the cursor it's showing the majority of the stomach. The function of the laparoscopic sleeve resection is to reduce the size of the stomach. Generally the stomach holds about what we say is about two handfuls of food. The primary function of the sleeve gastrectomy is to reduce the size and the capacity of the stomach. To do that, we staple along the outside of the stomach, or what's called the greater curvature of the stomach and create a partition between the tube of the stomach and the outer stomach. The outer stomach is then removed through a small incision, leaving only the gastric tube which carries the food as one eats.

To do this we use a variety of instruments. A laparoscopic procedure is done through small incisions, which we insert laparoscopic ports through. This is an example of one of the laparoscopic ports we'll be using today. It goes inside the abdomen, transverses the muscle layers, and the skin as well as the fatty tissue. Once it's inside we can then insert staplers through these laparoscopic ports into the abdomen and do all our work inside the abdomen via camera. That is the laparoscopic approach. This is one of the staplers that we commonly use in the operating room. It both clamps on the stomach and leads down a series of staples, and then a knife comes in between and cuts the stomach. I'm going to demonstrate here on a model of the stomach. The stomach typically would be sitting in the body such as this, these little pieces at the end would represent blood vessels which we actually cut before we take the stomach out and create the tube of the gastric sleeve resection.

The stapler goes on the stomach such as this, it clamps on the stomach, and then using this lever it fires while placing the staples down. Once it's fired, the knife retracts, it releases and creates the first staple line of the gastric pouch. We do this subsequently up through the whole stomach until this part of the stomach is completely removed, and then we take this out through a small incision. The results of the laparoscopic sleeve gastrectomy can be shown on a graph that we have on your screen right now. On the bottom bar are months after surgery--so one month after

OR Live
Tag 2678

surgery, three months after surgery. On the vertical bar is what's called percent excess weight loss, and this is how often we track weight loss after weight loss surgery.

If we generally take a patient that's about 100 pounds overweight, ten percent excess weight loss would equal ten pounds, 20 percent, 20 pounds, and so forth. So we can see that over the course of one month to 12 months, a year after surgery, a patient can expect to be losing about 45 to 50 percent of their excess weight, which would translate to about 45 to 50 pounds overall. Now, let me turn things over to Dr. Hoen. Dr. Hoen, can you tell us where you are in the procedure?

Thank you, Dr. Kowalski. We are just starting the procedure. We have put the ports in, as you can see, and we're ready to begin the operative part of the procedure. Before I go any further let me introduce our team in the room here. Assisting me tonight and most days is Tim Stallard. We have Tim (inaudible), the scrub tech, Crystal Wilson, our circulating nurse, and Randy Hughes, our anesthesia help for tonight. So without further ado we'll go ahead and look at the anatomy a bit. Let me have another (inaudible), would you? Back up, back up the scope. And let's just get a lay of the land here. Here's the right lobe of the liver with the gall bladder attached. Left, to the left, right here. Looking back right, here's a landmark that's important to this operation, is the pilorus, or the transition from the stomach to the small intestine. We use this as one of our landmarks for beginning the operation, a little further to the right now, here you can see the (inaudible) body and fundus of the stomach. Coming up here is the spleen, and up here is the cardio where the esophagus turns into the stomach. So our dissection--we'll go ahead and start a dissection--the way I do this operation is by taking the gastro (inaudible) vessels down first. We usually start this operation about five to seven centimeters from the pilorus. This grasper is approximately three centimeters in size so I usually do--about right there would be a good place to start.

Often question is what is the remainder of the blood supply? If you're cutting the blood supply and removing the stomach, what blood supply is left to the stomach?

So the blood supply that we interrupt is what might be considered a more minor part of the blood supply. The right and left gastric arteries are not transected. This is the blood supply that somewhat supplies the colon, supplies the stomach, supplies the spleen a little bit, but it's mainly considered a peripheral blood supply and the gastric sleeve that we make can survive easily, losing all of this blood supply on the greater curvature.

So the major blood supply is still intact.

Still intact. Using a device called the harmonic scalpel, this is an instrument that vibrates 55,000 times per second, therefore coagulating and cutting at the same time. Right below it's really just a centimeter or two below us, is the transverse colon; that's something you have to watch out for, but it's usually pretty easy to avoid. Not quite yet. Any questions coming in yet, Chris?

Not so far. Dr. Hoen, is this typically what you would see in most patients, laparoscopically?

I'll have to admit she's a good--a very good candidate operatively for this case. Her level of visceral fat is not extreme, and it's a real nice view of the anatomy. This is common, though, and it's not unusual to have views this good. Here we've just entered into a space called the lesser sac. We'll open this wide up, but this is a landmark we're looking for, and this is the backside of the stomach. It's free floating here, and nice open space. The pancreas, we'll get a look at that a little bit later, I would think, and it lays right behind the stomach.

So you really get a good view of the anatomy laparoscopically.

OR Live
Tag 2678

Oh, it's beautiful. You know, with our angled laparoscopes we're able to see things that are quite tough to see in open surgery, so in my opinion these cases are easier to do laparoscopically than they are open, if you're trained that way.

Certainly that's a question that often comes up, is what are the benefits of laparoscopic surgery, and as you were just saying, the visualization is often much better. As well, patients have reduced recovery times, less pain, faster time back to work. Is that your experience as well?

Certainly is. In our program we do--you're probably 95 to 98 percent of our weight loss operations through the laparoscope, so the vast majority of our patients are getting the benefit of a minimally invasive operation, whether it's sleep gastrectomy, gastric bypass or laparoscopic banding.

Dr. Hoen, as you are continuing taking down that blood supply I have a question here about what are the general guidelines for a weight loss surgery. Generally our guidelines for weight loss surgery is persons that are between 18 years old and 70 years old. That's sort of the specific guidelines. A weight less than 425 pounds--this allows us to do the laparoscopic approach. Also, a less than a BMI of 60. What BMI is, is what's called body mass index; it's a function of your height and your weight. So a BMI less than 60, in addition to certain clearances that we obtain prior to surgery. Some clearances we do routinely. Those are psychiatric and psychological counseling and evaluation, dietary counseling, as well as preoperative education. In addition to that we do some selected medical clearances on top of that.

Dr. Hoen, are we about halfway through this blood supply here?

Approximately. I backed up to the lesser sector. A little bit sticky over the pancreas--here's the pancreas right here. I just thought I'd come back and get this a little cleaner before we go on up the line.

That certainly is a nice dissection, really good visualization.

Let's take a look at the pancreas. Here's the body of the pancreas right here, this nodular organ right here--not an organ that gets seen very often, even in most general surgery cases, so patients often ask for us to look at their pancreas, you know, taking out a gall bladder and such as that, very difficult to do except when you do a dissection like this. So this is something you won't see often.

One thing that always amazed me about laparoscopic surgery is the--what you're looking at on the screen is actually magnified about two to three times, and just to see those organs much closer up, really almost under a microscope, is quite impressive. As Dr. Hoen was saying, is often times you don't see this kind of anatomy when you're doing open surgery, and that would be one of the benefits, per se, of a laparoscopic surgery.

Yeah, conversely, any time you have bleeding it looks a lot worse than it really is. I mean, a tablespoon of blood looks pretty impressive on these screens, but--yeah, but we're not playing (inaudible) tonight.

Dr. Hoen, I have a few questions that have been coming in. One question here from the Internet is, what food will I be able to eat following the surgery?

So for the first week, we are limited to low-calorie liquids and protein shakes and then we start a mechanical soft diet and slowly advance that over a month to six weeks, so on solid food. But the nice thing is with this operation is, as with the other weight loss operations, you can really eat a comfortable, solid small meal. So these operations don't take you out of the realm of social eating. You can still eat most foods, you just won't eat much of them, and fortunately you won't

want much of them, either, so that's why these things are so powerful, these operations so powerful.

Also wondering, Dr. Hoen, when you get to the top of the stomach, whether you can show us what did this for difference in the size of the gastric sleeve is to the size of the gastric pouch and the gastric bypass procedure.

That's a great point, Chris, we'd love to point that out.

Just like to point out that here at Shawnee Mission, we do all three major types of bariatric surgery--that would be the gastric bypass, or what's often called the (ruenawy ?) gastric bypass, as well as the laparoscopic sleeve resection, as well as the lap band or the laparoscopic banding procedures.

And you can--if you're looking you can see here, we have a really nice space between the top of the stomach and the spleen here, and often times (inaudible) often times the stomach is almost spot welded to the upper pole of the spleen there, making this part of the operation a little more challenging. But she has a very nice anatomy. This is something you can't predict before you start the case; no way to predict what this is going to be like up here.

I get often asked what the conversion rate, meaning if we start off laparoscopically, what is the conversion rate where we have to do open surgery, or through a larger incision.

In our program, it's very, very low. You know, we've both been trained to do it laparoscopically, and I'd say 95-plus percent of the time, maybe even higher, we get it done laparoscopically. So if we know going in that they've had previous upper abdominal incisional hernias or previous gastric surgery, it makes it a bit tougher and less likely, but in the vast majority of cases we can get it done laparoscopically.

I would agree, most of the time the anatomy is pretty predictable in this area if there has not been any prior surgery. There was a question there we had from the Internet: is there a standard size for the new stomach pouch, or is that determined by you at the time of surgery?

That's a great question. That's something we've spent a lot of time kind of fine-tuning over the past couple of years, and not just us, but nationally that's been looked at pretty carefully, because it's obviously important to start with the right size stomach, so you don't deal with delayed weight regain and the stretching that can come if the pouch is too big.

So there's some programs that do not use a template to size the stomach. I use and we use a relatively small (bougie ?) dilator--that's the name of the circular template that we use, and we'll show that to you. Actually, do we have it? It's a 34 (inaudible) and it leaves about a--can you give it to Dr. Kowalski?

So we make the sleeve over that, and we use that to size it, and it leaves about a three-ounce volume pouch or sleeve at the end of the operation. So quite restrictive, as you might imagine.

So this is the bougie tube that Dr. Hoen was describing. You place this down and once the patient is under anesthesia, down through the mouth into the stomach, and the sleeve is actually made over the top of this tube, so the tube gives us a guide to create that small gastric tube. So you really can see, if I give you an example of size, this is a typical pen, so you can really see that the tube of stomach is really going to be just about the width of a pen. So really again, the gastric sleeve's primary function in the weight loss is restricting the amount of food that one can eat. Weight loss is quite rapid, as opposed to a bathing procedure, and even approaches a gastric bypass procedure, which is both cutting the stomach at the top and then rerouting the intestines. This is only cutting the top of the stomach.

OR Live
Tag 2678

So we'll go ahead and pass that down, and I'll show you again--Dr. Kowalski showed the stapler earlier on, but we obviously couldn't do these operations without the great technology that we have, to give us a hand, and here's an example of it. This is the new articulating 60 millimeter linear stapler, linear cutter, and you can see that the jaws articulate, and then we can actually change the angle inside the body with very little force, and drop it, and fire three rows of staples on either side of the line. So very nice instrument, we rely on them for most of our weight loss operations.

Okay, so we are passing the bougie dilator, and we'll (inaudible) look at that coming into the stomach. So we'll lift this up. Okay, go ahead and advance it a bit. Keep coming. (Inaudible.) Keep coming. Hold on. Okay, there it is.

As you're doing that, Dr. Hoen, I got a question here from the Internet: why is the gastric sleeve better operation than other operations?

I like to sort of say towards that, that the gastric sleeve is one of only three options, three mainstream options for weight loss surgery. The benefits of the gastric sleeve resection are that the weight loss is fast, it does not require an implantable device, and we have good data now, over five years, to show that the weight loss is approaching gastric bypass. We often say that the gastric bypass is the gold standard for weight loss surgery, to which other operations are measured. As we get more information, both with the gastric sleeve and the gastric bands, we can compare one versus the other.

I know you and I had talked about that success within either of these operations, Dr. Hoen, is often marked to what the patient's expectations are. Would you agree with that?

I completely agree with that, and yes, I agree with it. These operations are similar but different, and you got to be educated going into it to have a result that you're happy with.

Certainly, one of the benefits of the gastric sleeve is that the recovery time is a lot less, as opposed to the gastric bypass. It's a less of a stress to the body, and so the recovery time is faster. Generally it's an overnight hospital stay, and as well, the risks are less than the gastric bypass. That's not to say that the gastric bypass is per se unduly risky, but if somebody wants to be getting back to work in a week, maybe a gastric sleeve might be a better operation for them than the gastric bypass. So really there's an operation that we sort of tailor to every patient.

Here we are, you can see the dilator is now all the way down near the pilorus. Here is the tip of it. So we have it angled exactly where we want, and then we'll basically advance the stapler and snug it up on the--you can see how the sleeve is starting to be created here, so what we'll do, we'll do it by feel and then we'll do it by sight as well. Then we'll flip it up and look at the backside.

Now when you say feel, you're talking about the feel of the tube that we placed down here.

Exactly. So you can get a sense of the tightness of your tissue against the tube, through the stapler, through feedback from the stapler. So I can feel the tube right here. I know if I move over a few degrees, it's going to be about right. Slide over. And then relax the tissue, allowing it to spring back to its natural elasticity, and then close the stapler.

We hold the stapler for about 15 seconds, to allow the fluid to get out of the cells, to get a more uniform staple line.

So getting back to the gastric sleeve resection, as opposed to the gastric bypasses, a question often comes up, why is the weight loss so much faster than a banding procedure? Why would I not get a gastric sleeve or band, vice-versa? Besides the restriction function of the gastric sleeve resection, by just taking off that remainder of the stomach, that redundant stomach there, do you

feel there's a hormonal effect, with this gastric sleeve resection, actually affects hunger and metabolism?

Yeah, we do. We know that some of the major hormones that are involved in the satisfaction of eating, or the satiety response, are formed in the greater curvature of the stomach. Well, these hormones that are produced in much lower levels, normal or below normal levels, once that part of the anatomy comes out. So it works in two ways at least, probably more, but decreases the drive to eat through hormonal modulation, and then greatly restricts the caloric intake. So we've articulated the stapler, right along the line we want to take. You can see that sometimes this is done without a dilator inside. Not in our program, but you can see how it might be a little tough, especially in patients with more fat on the (inaudible) of the stomach to actually get to the right size. So I feel it again, I back off a little bit, close it, we'll look at it from the bottom. And looks good. Get a good look at the (inaudible) artery here, pumping away. (Inaudible.) Right there, big artery right there, (inaudible) the spleen. So there's a little bit of tiger country back here.

Dr. Hoen, I got a question from Twitter about what are some of the complications of larger incisions?

Well, first off, there's extra pain, a larger incision would per se relate to larger pain. Often times as well, the more tissue we have to cut, the more tissue that has to heal, and so during that healing process that tissue can be susceptible to infection. You could also develop a hernia. And so there's a potential for larger incisions to have more problems, and that's really one of the beauties of laparoscopic surgery is that the incisions are very small, the pain is less, and the recovery time is very good, and that can be pretty much said across the board for whether it's gastric bypass, gastric sleeve, or gastric banding.

Chris, I've never Twittered before, so that was the first. Good job, man.

Well thank you. This is a new one for me, too. (Inaudible) audience out there that's involved.

I thought you tweeted from the operating room most days.

No, that's just at home.

All right, so here we go, further up. And get a little tighter, and relax it. There we go.

So you're almost done here. The stomach's almost out already.

We're moving right along. It's about 60 percent transected at this point. Probably require two more staple loads to get it done.

Also have another question from the Internet here about what a centers of excellence is. I think this probably came from the Shawnee Mission Web site, or our Web site, CaseyBariatric.com. What is a COE, or a centers of excellence? A centers of excellence is a designation that's been given by our surgical society to show excellence in the field. And so you may see a centers of excellence for transplant surgery, cardiac surgery, and there's also a centers of excellence for gastric bypass, gastric sleeves, and gastric banding.

The other part of a centers of excellence that is implied is that there's a full line of other specialties involved, and we also offer all the procedures regarding weight loss surgery. We have different sort of levels of designation for centers of excellence--level one, level two. Level one, such as we are, do gastric bypass, gastric sleeves, and gastric bands. Some centers of excellence could be a centers of excellence only in lap band, or only in gastric bypass, and I think the ability to do all three operations really gives the patient the best opportunity and the best choice in what operation is good for them. In addition, it's nice to be able to offer an unbiased

OR Live
Tag 2678

view to the patient, as far as what the gastric bypass is and what the gastric banding will do, one versus the other.

Also, we have many specialties that are involved--dietary, psychology, pulmonary, cardiac. We have nurse practitioners and all the equipment in the hospital and in our office that accommodate bariatric patients, and that is one of the requirements as well for centers of excellence. How long have we been centers of excellence now, Dr. Hoen?

Coming up on three years. Actually, maybe three and a half. So we're up for recertification here within the next six months and looking forward to that.

Should mention there's also a volume issue requirement for centers of excellence, and that generally is over 200 cases annually (inaudible) year for all bariatric surgeries. We're doing probably upwards of--what would you say, Dr. Hoen, 700? 600, 700?

I'm sorry, Chris, I was talking to Jim.

Been talking about the overall volume of a Centers of Excellence program.

It would require at least--is it 125 or 200?

I think it's maybe 125 to 200, depending on per year.

We're far above that. We're going to be well over 500 this year, and have been consistently high, so this is a center that does high volume. The peripheral support is up to speed, and we're lucky to have the support that we do.

I got a question here: how far is Shawnee Mission? It looks like it's coming from Wichita here. I'm--just in general, Shawnee Mission here is approximately about--from Wichita, about three hours, St. Joe in Kansas is about an hour and a half. Lawrence is about a half hour away, Topeka is about 45 minutes, Lees Summit maybe about 45 minutes away as well, so it's pretty easy to come around 435 and we're right here off of 35 on--should mention that our office, Dr. Hoen and myself's office, is right next to the hospital, attached to the hospital.

We also had the opportunity, over these last few months, to work at a satellite facility that's part of Shawnee Mission called Prairie Star, where we started doing some banding procedures.

Dr. Hoen, pretty much done with the stomach here? Is that the last spire, or--

One more. (Inaudible.)

How long will you keep a patient in the hospital for this operation, Dr. Hoen?

It's generally a one night stay, so they'll get a (inaudible) study in the morning, to look at the staple line and make sure everything is exactly how we wanted it to be, and then start a liquid diet, go further on their ambulation, and then usually home by mid to late morning of the first post-operative day.

On a percentage basis, how much stomach would you say is removed, and how much is left here?

I'd say about 75 to 85 percent.

Of the stomach, I would agree. That would be--I guess with compared to the gastric bypass, the gastric bypass really would be about ten percent, so we're talking of very close volumes.

OR Live
Tag 2678

Yeah, in my mind, I kind of think of the bypass as leaving a two-ounce pouch, and this is three to four, as far as volume goes.

The advancement of the diet is pretty much the same as well, with the gastric bypass and the sleeves, in your experience?
Very similar.

So generally would be starting on liquids for the first few days, moving into protein shakes over the first week, soft foods is generally a week to two weeks, followed by soft type foods such as cheeses and tuna fish, soft meats, and generally up to at three or four weeks, being ground beef, ground turkey, chicken breast. One of the things overall with any bariatric surgery is that we find that the thicker the meats, or very thick breads, are really the only foods that cannot be tolerated too well, unless they're chewed very well. But in general, whether it's the banding procedure or the gastric sleeve or the gastric bypass, the variety of food is quite good.

As Dr. Hoen was saying earlier, people can socially eat with the gastric sleeve or a gastric bypass, gastric band. That's one thing that people are always worried about is that they'll be so much different. It's not so much different, it's just a much less volume of food, and part of the operation--we like to say that the operation is really a tool for one to lose weight. (Inaudible) also, the behavior has to change, and so over time, these operations help you change your behavioral patterns, and the volume of food just becomes less, and people slow down when you eat, they chew well.

Take one last staple out here. We probably could have cut it with the (indoshears ?), but no reason to skimp on this part of the operation.

Sure, you're right up there on the spleen, aren't you?

We certainly are. So very close to the esophagus, very close to the spleen. It's pretty important real estate up here. (Inaudible.) There we go.

So I got another question from the Internet here: how do I get started in the program?

People get started in our program by going to one of our seminars, and if you go to the ShawneeMission.org Web site, or our Web site, CaseyBariatric.com, there will be a prompt there to sign up for a registration for a seminar. We give them twice a month--it's myself or Dr. Hoen giving the presentation. We'll go over really in detail every operation, whether it's the gastric sleeve, the gastric band, or the gastric bypass. Once you attend the seminar, and you get an idea of where you're maybe wanting to go, as far as what operation you're going to choose, your next step would be to come and make an appointment in our office after some of your medical records are sent in and a preliminary questionnaire is completed.

You see here that Tim is dilating the fascia, in order to get the specimen out, so let's take a look at the size of the specimen relative to the sleeve. (Inaudible.), you can pull the bougie dilator now, to get a better picture for ourselves and our viewers. All right, so here's the stomach, you can see it's turning a bit dusky, as you might expect, (inaudible) and here's the sleeve. Nice little pouch coming down there, you can see this staple line, a real nice looking staple line in my opinion. (Inaudible) spleen, everything looks just fine, so we'll go ahead and dilate this, and take the gastric remnant out, or this large portion of the stomach, we'll get it out of the body.

Got another question from the Internet here, about what are the chances for the stomach to grow or expand, after it's made so small?
In general, the restriction is the most right after the stomach is stapled, whether that be the gastric bypass or the gastric sleeve. Over time, all tissue softens up, very similar to scar tissue on your skin, scar tissue inside your body would soften up, and you're going to have an increased capacity for food over time, but in general, the baseline as far as the restriction in the amount of

food, is generally what we say is can fit in the palm of your hand, and so if you think of a small meal, or a pre-portioned meal that would fit in the palm of your hand, about half of that being protein such as chicken or fish or meat, and the other half being vegetables and a small starch, the biggest issue with rapid weight loss and weight loss surgery is to keep up the protein, and so we all really stress protein, protein, protein. And that's both to help your body heal, but also so that there is no wasting of the muscle as you lose weight, and the protein levels in your body stay high.

And I would add--I totally agree with that, but one thing I would add is that these operations, both the gastric bypass and the sleeve gastrectomy, the delayed weight regain I think is highly dependent on the size of the pouch, as it starts out. So if you make a smaller pouch, or if you make a smaller sleeve, that is based on the lesser curvature of the stomach, where it's less elastic anyway, the chance of that stretching out is much less. So thus, we try to use very small bougie dilator to balance the possibility of delayed weight regain with the possibility of a stricture, and that's where we kind of got on the 34 fringe dilator for this operation.

Dr. Hoen, before you put that (inaudible) glue in, could you just show us what the size of a gastric pouch may be, for a gastric bypass?

Yeah, good point. So when Dr. Kowalski and I do the gastric bypass operation, the first part of that operation is making a pouch up here, and generally the pouch--pull back a little bit, Tim--the pouch dissection would start about right here, so we're only about three-plus centimeters from the diaphragm, and then it comes across and then straight up, so the pouch is only about two ounces in general, as opposed to the sleeve that trails on down here and gives you three to four ounces of volume.

So--and then we--in the gastric bypass, obviously we're not done at that point. We have to bring (inaudible) up here called the (rulim ?), and hook it on to the pouch, and there we have created a slight malabsorptive component of the operation, by bypassing about three feet of small intestine.

That's what's really the interesting part of this operation, is is that's how this was developed as a weight loss procedure, how this operation was developed was that this was a stage procedure, going to a gastric bypass. Surgeons, about five years ago, started using the gastric sleeve resection on people that were approximately 200 pounds overweight, with the idea that the recovery would be faster, and it would be less stress to the patient's body, which it is. So what they saw, however, over the first year to two years was that patients just kept losing weight and they never actually had to convert them into a gastric bypass. So what Dr. Hoen was showing before on the stomach there, with the gastric pouch, if it needed to be turned into a gastric bypass it could, by cutting that sleeve in half. But now, the gastric sleeve is being used as a primary weight loss operation.

Do you have a picture of that stomach? Can you show us the--

I do, I have it. Do they want to see it through the laparoscope or through the--

Can see maybe as opposed to your hand.

Here we go. So here, you can see this as the gastric remnant that we took out. Just going to measure the staple line for you. It's about eight or nine inches in length. This is already starting to contract, so it may look kind of small, but it started out bigger. Also, this is the elastic part of the stomach, so this is the part that stretches during large meals, and can go to at least two to three times this size. So this will go out to the lab, to make sure there were no problems with it, and then never to be seen again. We'll go ahead and put in the fiber glue on the staple line here. There's a sealant that helps with hemostasis, or bleeding issues that we might have on a staple line. We've created almost a foot of raw staple line here, and we do everything we can to make sure we don't have issues with bleeding, or with disruption of the staple line.

I just got a question from the Internet, about what are some of the potential problems with this operation. One is bleeding, which Dr. Hoen alluded to, and we used both the staplers at the time of the surgery help with that bleeding by compressing the blood vessels on that gastric tube that's left. As well, we used the sealant that's a type of biological glue, that actually helps the body form a blood clot and scar tissue over that staple line.

Bleeding, the other major complication would be the staple line's breaking down. We see that very rarely, but it can happen. It's made such a big issue because it does happen, it can be serious, but in our experience, really leaks have been minimal, if at all present. What are we looking at here, Dr. Hoen?

So here we're looking at the sleeve again, and this is the staple line that we've just sprayed the fiber sealant on, and you can see that this specific brand of sealant congeals a little bit, and shows up as an opaque solution, so you can kind of tell where you've been. This is a substance called Tisseel. Lays down a nice line. We also are getting ready to test this like you would test a bicycle tube, per se. We're going to advance the endoscope down, look inside the pouch. As Dr. Kowalski was talking about, the concern for leakage, we take that very seriously so we checked that multiple times in the operating room, and then secondarily we check it tomorrow morning with a swallow study in radiology. So I'm going to go to the head of the table here for a moment. We're going to pass the endoscope, look from the inside, we can look at the staple line from the inside and make sure there's no bleeding, and then we'll put it underwater like you would a bicycle tube, blow it up a little bit, and look for bubbles, which we're not going to see.

So I just wanted to reinforce that. We've really taken great lengths to both look at the staple line and test it in the operating room, and generally I tell patients, before their surgery, that leak is always a risk, whether it be a gastric bypass or a gastric sleeve, but a patient will not leave the operating room with a leak. Is it possible to develop a leak over that week? It is a possibility, but really as the technology of staplers has advanced, as well as the concept of a centers of excellence, meaning that Dr. Hoen and I only do bariatric surgery at this point. We do general surgery as well on patients that have had bariatric surgery, but our primary focus is on bariatrics. And once the level of concern for a patient is raised, as well as the technology improves, some of the complications that have been seen in the past really are not showing up. And so really, there has been sort of an advancement in bariatric surgery in that regard.

So Dr. Hoen, you're going at the top to look down at that sleeve.

Here we are. The endoscope has advanced all the way through the sleeve. Here we are--I don't know if you can get the endoscopic picture for public viewing, but we're looking at the pilorus, which is the valve leaving the bottom of the stomach, a nice view of it there. And then as we back up, the staple line has been visualized from the inside. Now we're under (insufflation?), or the stomach pouch is blown up, and Tim will be looking along the entirety of the line for bubbles, and if it were to happen, it's usually pretty easy to find. So I'll go ahead and suck it out now. We're very confident we don't have any staple line problems.

I got an interesting question here from the Internet, Dr. Hoen. Is it possible to get pregnant after one of these operations?

Certainly is.

I guess it always is. Generally what we recommend with pregnancy after any of the operations, whether it be the (inaudible) procedure, the gastric sleeve, the gastric bypass, is that we generally tell you to wait for two years after the operation, and it's not because it's any extra danger to the mother or the child, it's that the weight loss is affected, and so really in those first two years after surgery is what we call the golden window, and in that golden window we see the most weight loss, and so we don't want anything to affect that weight loss. We don't want the body on one

hand to be trying to lose weight from a weight loss operation but retaining weight for a pregnancy. If it does happen, the outcomes are safe, but generally we recommend two years after the operation.

How did the gastric tube look, Dr. Hoen?

It looked great. You can see, Tim, we leave the surgical drain in overnight. Drain a little extra fluid that we've left in, and if there was some bleeding we'd be able to pick up on it right away, but we leave this in all of our bypass and sleeve patients overnight. And we just lay it right up there against the staple line. Looks fine. Go ahead and take out the (inaudible).

So we're more or less done at this point, Dr. Hoen.

We're essentially done. So here's our liver retractor coming out. If there's not much more to do, we could look around the belly a little bit.

So if we look at operating room time in general, we generally see that there's about half an hour of anesthesia, by going to sleep and waking up, and actually the operating time itself is about a half an hour, 20 minutes to a half an hour with the gastric sleeve. That's about comparable to a gastric band as well. The gastric bypass is slightly more involved, it maybe takes about an hour, to an hour and 15 minutes, but really the laparoscopic revolution, if you will, really has improved operating times and outcomes overall.

Got another Twitter here. How quickly does the biological glue dry, and what is the glue called?

It's about 15 seconds till it will stick to a suture line and won't be washed away by our irrigant. The kind we're using is called Tisseel. There's several out there, but we like their applicator quite a bit.

That fiber and glue is a natural--it's a synthetic formulation of what the body naturally produces to form scar tissue and clot, so if you scraped your skin, often times you would see the yellowish (inaudible) that looks over the top as you form a scab on your skin. This is the same material that your body naturally produces. We lay it on the staple lines to help with the bleeding, to help scar tissue, but then the body actually leaves its own scar tissue down and just sort of helps that process along. It's an extra reassurance for us and for the patients.

Just closing up the belly here, so we closed the larger of the ports here at the fascial level, so we don't get a hernia.

And what is the pain like post-operatively with these patients?

Pain is not a big complaint. We don't get a lot of complaints about that. We keep them on a patient-controlled analgesia pump overnight, and by the following afternoon when they go home, they're on a little bit of oral pain medicine, for a day or two. More bloating--a little discomfort, but not frank pain.

And generally people are back to work within a week, I've seen with the gastric sleeve or gastric band. Slightly longer with the gastric bypass, maybe two weeks. Just it is a larger operation. It's a little bit more stress to the body, so when we get into questions about what operation is right for every person, there's certainly the medical reasons why one person would get an operation versus another. For instance, if you didn't have a stomach, you certainly couldn't do a gastric bypass. That would just be the most obvious example, but certainly any prior surgeries, it was extensive upper abdominal surgery; these would be operations that would make surgery more difficult and maybe lean us one way or the other, versus a band, versus a gastric bypass. More operations may be lending itself more to a gastric band, as it is an easier procedure.

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And so there are questions like that, but also as far as recovery time, sometimes people cannot take off more than a week to two weeks for recovery time, and that would be into the decision-making to have the band versus a gastric bypass versus a sleeve.

The sleeve really has come about as a primary weight loss operation over the last two to three years. We have data five years out now, Dr. Hoen, as far as the long-term weight loss?

We do.

And generally it's been seen to be about the same as the gastric bypass, from what the large centers that have been doing it in New York. Would you agree?

I do agree. So we're done with the operation. We--are there any more questions before we sign off?

How quickly will the patient recover--we talked about that--about a week to two weeks. As far as pain, really, what's the biggest recovery issue, with the gastric sleeve resection, in your opinion?

I think it would be the adjustment to the diet. Really, the pain doesn't slow them down much. They're fully ambulatory pretty much the night of the operation, so by the next day or two, they're walking around the house, walking around the block, things like that. But I think just the limitations of the diet early on, kind of getting used to that, is probably the biggest adjustment for our patients.

Often times I see, once the diet advances, the energy level comes back and the recovery time shortens once the diet is improved. And that's faster with the gastric sleeve than the gastric bypass. Really the diet doesn't thicken up until about two weeks, and then goes on with the recovery time.

Just look to see if we have any further questions here from the Internet, or Twitter? There's a question, can you band the gastric sleeve resection?

You know, I have not personally banded a gastric sleeve resection. I have banded a gastric bypass. I don't know that that would be the best operation to do, and we haven't--certainly haven't seen our own experience yet that we would need to, so it's been a very durable and stable operation.

Generally the answer to that question, I think, is that the gastric sleeve was built as a bridge to gastric bypass, so if a gastric sleeve per se failed, that patient is going to lose that 50 percent to 60 percent of weight, long-term, at two to three years, and you could turn a gastric sleeve into a gastric bypass, but often would not put a band on a sleeve. We could put a band on a bypass, but not a band on the sleeve. It would go to a gastric bypass.

I think that's all the questions we have right now. We are about out of time here, so I'd like to thank our audience for joining us today, and for what I hope was an informative webcast. But I'd also like to extend a special thanks to our patient, who agreed to have her procedure webcast today. Without her willingness and generosity, this program would not have been possible. This has been a gastric sleeve surgery, live from Shawnee Mission Medical Center in Merriam, Kansas. I'm Dr. Kowalski. For Dr. Hoen and all of us at Shawnee Mission Medical Center, thank you and good night.

Thank you for watching this OR Live webcast presentation from Shawnee Mission Medical Center, in Merriam, Kansas.

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