Laparo-Endoscopic Single Site (LESS) Procedure

Tampa General Hospital
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Welcome to this ORLive webcast presentation, live from Tampa General Hospital in Tampa, Florida. In just moments, Dr. Alexander Rosemurgy and Dr. Sharona Ross will perform the newest method in gall bladder surgery, the LESS procedure.

Laparoscopic Endoscopic Single-Site Surgery is a surgical approach where a single incision is made through the belly button leaving no visible scar. Viewers can send their e-mail questions to the doctors or request more information to learn more about the LESS procedure or Tampa General Hospital. Now, let's join the doctors.

We are broadcasting from Tampa General Hospital in Tampa, Florida. My name is Sharona Ross, and I'm here with Alex Rosemurgy and Mike Albrink. Our patient is a twenty-four-year-old lady with recurrent right upper quadrant pain associated with fatty food. She was diagnosed with colecistitis. Alex Rosemurgy, can you tell us how you start the operation?

I'm here with Dr. Albrink, and what we're doing is we're grabbing the umbilicus. Dr. Albrink is going to be doing this operation, and I'll be helping him. We've grabbed the umbilicus. Now, I've marked it in purple here where the umbilical ring is. So when we reduce this back down, we do not want to violate that because this whole operation is about no scar; such that when we're done, we want to leave no telltale evidence that we've been here. So I'm going to now put in local anesthetic into the umbilicus. This will disfigure it some, and so we want to make sure that we minimize pain as much as possible. So we inject the local anesthetic before the pain fibers are activated.

Now the incision is being made in the umbilicus in a north/south direction, and we're going to enter into this little natural umbilical defect that everybody has. And we work a little bit here to do this because a little bit of effort here really helps us later on in making sure this looks real nice. Can I have another snap?

And now we have entered into the peritoneal cavity. This natural umbilical defect -- everybody's got one -- I lost it there. And you can see there's a fair amount of fluid here. This is just the local anesthetic that we injected, and I think that we're going to be okay here. Now we're going to use a commercially available port. It's a multi-trocar port, and there are several on the market. This one's nice. It's got an introducer, which makes it nicest for a small incision like we're making here. And for when we utilize the different other operations, then we sometimes will use -- can I have an "S" retractor, please? -- sometimes we'll use a different port. There's a SILS port, which is nice for when you have to insert more instruments in, like -- get the snap back. I just need to make -- to get this to slip right into the defect. I'm having a little bit of a time here slipping it right into the defect. I'm not getting it there perfectly, Mike.

How long do you usually make the incision?

Incision, we want to be about -- no longer than 12 millimeters, because when it gets longer than 12 millimeters, then we run into problems with disfiguring the umbilicus.
This is a reminder to the viewers that you can --

That was a little bit of effort there. And now I'm deploying the port into the peritoneal cavity, and now we're going to just slide this down.

This is a reminder for the viewers that you can ask questions by clicking the button on the website, and we'll try to answer to the best of our abilities here -- once again, at Tampa General Hospital.

Now this port gives us three points of access into the peritoneal cavity. One will be as big as 12 millimeters in size. Insufflation now, please. This has additionally two insufflation ports. All right. And we're off -- okay. Now I'm going to just make sure the valves are nice and lubricated to allow the instruments to slip in easily, and that will allow them to -- for everything to slip in very nice and easily.

Ultimately what we'll be using here is going to be a grasper, this 5 millimeter deflectable-tip scope, and then an energy source. And there's the gall bladder right there. You have a little bit of -- not much -- there you go. That's a nice picture.

Do you have the patient reverse (inaudible), please?

What kind of laparoscope are you using?

We're using a 5 millimeter deflectable-tip scope. (inaudible) reverse (inaudible), please. And the reason for this is it helps us obtain the images we want; for example, a critical view.

Now, Dr. Albrink is doing this. Dr. Albrink to me is the Jedi knight of laparoscopy.

Can I have a locking grasper? And I'm going to hold this up. Sometimes we will utilize adjunctive sutures for retraction.

Cautery.

Sometimes what instrument we put in what spot is really quite telling. And it's the cylinder of the umbilicus that we want to -- or we consider to be the "high rent" area of the umbilicus in this area. And so -- let's see, I'm going to retract my instrument over towards Dr. Albrink. Now it's away from me -- in other words to the patient's left side. It's Dr. Albrink on the patient's left side. And so we are -- I put my instrument on the left-sided most port so that when I retract it more to the left, then it wouldn't be going into the middle of our cylinder -- coming out of the umbilicus -- but rather away from it. And that facilitates -- jeepers creepers, I'm having a hard time grabbing this.

I think it's chock full of stones, so to speak.

Chock full of stones. Now we always want to be retracting and moving away from the cylinder such that the operating surgeon alone works there.

Handheld cautery, please.

Who's a good candidate for this type of operation?

I think a good candidate for this operation is somebody who -- it has a couple things. One is that it's a little harder if they have acute disease. And it's a little harder if they have a big BMI. And it's a little harder if they've had previous intra-abdominal surgery. So that previous intra-abdominal operations, for example, will be some problems.
Can you roll the patient towards Dr. Albrink? And I'm rolling the patient towards Dr. Albrink just to get that little bit of liver -- that's fine -- to get that little piece of liver to come out of our way.

Now, the goal here is to do the operation much like everybody's done the operation before. We're not trying to invent a new operation.

How do you think I can do that, Mike?

I think it's beautiful retraction.

Is it? Well, could be -- you've got that little bit --

I want to stop and look and see if we've got porta hepatis here, which I believe is all along through here. The thin film here, we'll take that off.

Do you want to take a hook to cut that down?

What's the -- I notice that you're using the LESS or SILS port -- I mean, you're not using the SILS port, but instead the TriPort. What's the differences?

There's a SILS port, which is really a very nice port. And it allows for four points of access. So you can, for example, use a camera, two dissectors, and an energy source. It takes a little bigger incision. This lady had a little smaller umbilicus. The problem with the TriPort is that you lose one point of access. You only have a place here for a camera, a dissector --

Can you roll the patient just a little bit more towards Albrink? I'm trying to wiggle that -- there you go, perfect.

The TriPort that we're using allows us to have an energy source, a dissector, and a camera. But we think we can do the operation with just that. Now, if we needed to do -- if the exposure wasn't quite good enough, we would go ahead and we would put in some adjunctive sutures. And the way we'd do that is we'd take a 2-0 polypropylene suture on a Keith needle -- or on a straight needle -- and we will place it into the peritoneal cavity -- through the abdominal wall, and then we'll put it through the gall bladder, and then back out through the abdominal wall. What that will allow us to do is to retract or deflect the gall bladder in some way. It's almost like puppeteering in some extent, and so we will utilize it to move the gall bladder to the left, to the right, and so on. And in the course of doing so, we'll get just exactly the exposure we want.

So wouldn't that be -- for the most part, we used to use that when we used two 5 millimeter trocars at the umbilicus.

Right.

And now with the TriPort, we for the most part would use the suture in the fundus of the gall bladder and then utilize a grasper to laterally retract the infundibulum so people can see the critical view in, you know, with just one extra suture. Are you worried at all about bile leak?

Well, in the circumstance where we just talked about where we use an adjunctive suture, there is probably a little bit of bile that could spill -- no stones, but a little bile gets spilled, but it's proven to be absolutely inconsequential, particularly given you can irrigate and wash. So in summary, there's three different ways you do this. You can utilize conventional, small laparoscopic ports. The advantage of that is you can make a small incision, and it's easy. Mike, do you want me to switch?
I want you to re-grab down by the infundibulum, and I'll hold it.

Okay.

Although I'm blocking it a little.

No, you're doing fine.

See, we're going to swordfight just a little bit. Why don't you just completely let go?

Okay.

You see right now the difficulty with the single incision at the same time is working in parallel. The laparoscopic deflectable-tip 5 millimeter scope is the one that allows you to bring the scope all the way to the interior abdominal wall and then deflect the tip down, so you can see the tip of the instruments rather than the shaft.

How's that?

I think that'll be a little better. Yeah, maybe you ought to clean the scope too.

Why don't you just try rubbing it on the liver?

Yeah.

There was a question from the viewer as to what kind of gas we insufflate?

We insufflate with carbon dioxide because it's quickly absorbed. But you could use other. You could use, for example, helium; but as a convention, carbon dioxide's used.

Is there a learning curve for LESS surgery?

No, we've looked at the learning curve with this; and the bottom line is that the learning curve proves to be quite short.

Again, I'm having a problem grabbing this. And as you can tell, I'm kind of regretting the fact that we let go and re-grabbed it because on the premise that it can always be better. Right? We did it, but -- now the camera's just a little smudged. Here we go. Maybe we can get it in there and it will be a little clearer.

Okay, what you can see is what Dr. Albrink's doing is he's touching it against the stomach and he's touching it against the liver in hopes that the camera -- the picture looks real nice.

I'll tell you what. Let me have a crack at it here while you get geared up to do that.

Well, I did better.

There you go.

Okay, good.

Good. Alexis?
I'm here with Alexis. She's going to hold the scope for us. Alexis is the world's greatest scrub nurse, and Dodie's getting her circulating. We have a fine little team here.

So you were starting to talk about the learning curve.

The learning curve seems to be quite short. We've looked at our learning curve by now, and we've probably done about three hundred colecistectomies. And we've done at last count about pushing seventy fundoplications and about seventy heller myotomies and a whole host of other operations including but not limited to distal pancreatectomy, hepatic cystectomy, adrenalec-tomy, some gastric tumors, small ball tumors. And we've participated with gynecology in a number of combined procedures like hysterectomy and a reflux operation; hysterectomy and cholecystectomy; hysterectomy and so on. And what we have found is that the learning curve with this is reasonably short, such that after about twenty to twenty-five of these operations, I think people that are good at laparoscopic surgery and laparoscopy are pretty well versed in doing the operation with utilizing the laparoscopic single-site or LESS techniques.

Dr. Albrink now is dissecting around the cystic duct, and he's taking his time to make sure that he's not misidentifying something. He wants to make sure that he's got the cystic duct there and only the cystic duct there. And I'm going to give him a little twist on the gall bladder and see if I can't give him a little better exposure, but I'm struggling a little bit to do better.

The nice thing about the deflectable-tip scope is that you don't have to be able to see straight on into the cystic duct. You can articulate the tip of the scope in such a way that you see around the corners to some degree.

And now Dr. Albrink's using a roticulating instrument.

And just to mention about the laparoscopic -- the deflectable tip, one of the advantages is being able to lean the scope parallel to the patient's abdominal wall. So like Alex mentioned before, it allows you to open the cylinder.

You see, Dr. Albrink now is around the cystic duct. The point that Dr. Ross is just making is really a critical point; and that is that the cylinder coming out of the umbilicus -- the cylinder here -- you can see -- can they see my hand here? -- the cylinder here coming out of the umbilicus is really the high-priced territory where Dr. Albrink for example is working. And so when I retract the instruments, I want to retract them this way, out of the cylinder. He has the scope here. The goal isn't to put the scope in and wiggle the tip. The goal is to bring the tip in from left field and then deflect the tip such that he's able to see what he needs to see without interfering with his operating instrument.

That's kind of a two-handed instrument. Why don't I actually help you?

I was going to maybe do the artery here. I can see it fairly well.

Right. So by reflecting -- or deflecting the tip of the instrument, I'm able to get a pretty nice view here of what we're using. Now, this instrument that he's using is a reticulating dissector. It's an instrument made by Covidien, and we have utilized it with some frequency. I do not like it; and I don't mean to speak for Dr. Ross and Dr. Albrink, but I think I kind of pretty much am. I don't like articulating instrumentation because bending the handles in the cylinder takes up more space. So what I like -- rather is I like the roticulating instrument because it allows me to keep my hands out of the cylinder.

Now, you'll see -- if you can see the operative field here, I am -- I have the camera kind of laying down on the patient's lap. And that allows me to keep the camera out of Dr. Albrink's way. And then I deflect the tip of the
scope in such a way that we see the critical view very nicely -- the critical view being the view of the cystic duct, the cystic artery -- and make sure that we're not misidentifying or something, whatever. And this looks just right.

So I see the cystic duct going into the gall bladder, and it looks obvious. And what he's going to do now is he's going to take out the cystic artery here, which is kind of flimsy; but it is what it is. We didn't make it that way. It just came that way. And he's going to put two clips towards the gall bladder and two clips towards the cystic duct, just in case one falls off. It's more of an issue with the cystic duct than it is with the cystic artery.

Now he's taking a little pause here just to make sure that we haven't done something stupid because it's not what you see that gets you in trouble, it's what you don't see. The old expression about it's not the sand traps that you see that catch your golf ball, it's the sand traps you don't see. And now that he's inspected this and he's certain, then he's going to cut this leaving a little longer cuff on the side towards the cystic -- towards the common bile duct than towards the gall bladder. It leaves a nice little cuff there. And he's now dividing across the cystic duct. And now we're coming up -- he's going to divide the artery wall. He's there.

There's a little branch behind there; I don't know if you saw that.

I see it, yeah.

Okay.

Now, for surgeons who normally would utilize three or four incisions, should they go from four to three to two incisions, and then end up with one or vice versa? Start with one.

I think very strongly is that they should -- they ordinarily do this for example as an umbilical incision and then three distant incisions with trocars, that they should go to one incision at the umbilicus because you can always add an additional trocar.

Dr. Albrink's switching over now to hook cauter. He has the pedal on his side.

And at some point, Mike, we might want to re-grab a little bit and see how you do.

So you can always add additional trocars. So I feel quite strongly that what you should do is you should go to a single incision; and then from the single incision, you should -- if you need to -- add an additional trocar.

Alexis, can you take the camera for me for a second? Okay, let's see if I can do something that provides you just a little better exposure.

So like we mentioned before, at any point you can add a percutaneous suture if they elect to do so, if they don't feel that they can see what they want to see.

Yeah.

Or if they had a different trocar where they had four different ports with four trocars, they could have used two graspers at the same time. So the options are great.

The key here is safety. It's safety, safety, safety, safety, safety. There is no substitute for safety. And so if you need additional trocars or ports to do the operation, you need additional trocars or ports to do the operation. That's just the way it is. And remember that converting a patient -- for example, adding more trocars -- is not failure; it's good judgment. Patients will certainly tolerate an extra trocar without much muss or fuss. But they certainly will not tolerate bleeding or a bile duct injury or something like that. So it's safety, safety, safety, safety,
safety. And in the course of having said that mantra, then if we need to add an additional suture, we need to add an additional suture.

I think you're hooked to suction if you need it, Mike.

Yeah.

And if we need to put in an additional trocar, we need to add some sutures, we gotta do what we gotta do.

As you can see now, he's separating out the peritoneal attachments to the gall bladder. And I'm just trying to retract this out of his way. I'm not really giving him a left twist or a right twist. I'm just retracting and kind of pulling this out of the porta hepatis. But now I think I'm going to try to give him a little bit of a right twist.

Nice.

There was a question among the viewers as to how long we've been doing LESS surgery. I can speak for all of us. We started in the fall of 2007 with a gall bladder operation. And the second operation was actually a Nissen fundoplication for anti-reflux -- for gastroesophageal reflux disease. And from there we went to Heller myotomies, inguinal hernias, pancreatectomies, hepatic cyst excision, appendectomies, spleenectomies -- everything that you can think of that you would otherwise do laparoscopically would pretty much start with single incision. And if we need -- like Dr. Rosemurgy mentioned -- if we need an extra trocar, we just add it -- and we'll add it one at a time. So in other words if you used to do the operation with five different incisions, we'll start with one and add one at a time as needed.

Now our experience is probably up to over five hundred operations that we've utilized the single-incision techniques for, and this whole experience really began through just lots of dialog and discussion. Dr. Albrink had wondered if it would be possible to do this, and he did the first single-incision operation; he did a cholecystectomy, and then we talked more about it. So it's really been a very collaborative effort.

I think one of the key parts of this is not only having a very good and cooperative OR staff -- because really we are only as good as they help us -- and Dodie and Alexis are great. But as well, part of the issue here --

Could we have the camera just a little bit, Alexis?

A little closer.

Part of the issue as well is that you need the proverbial wingman. And Dr. Albrink and Dr. Ross for me have been great wingmen. And they've helped me greatly, and I hope I've helped them.

What about the wingman? What about the wingwoman?

The wingwoman?

There you go.

Wingperson.

So here the gall bladder's now coming off the gall bladder, and it's just a few peritoneal attachments. Now, with this port, this is not an issue. But ordinarily we're going to want to make sure this is bone dry before we lose the gall bladder or we'll lose our exposure. So Dr. Albrink now is going to lay down just a little cautery and make sure that there's no bleeding before he separates the gall bladder from the gall bladder fossa, or from the liver. And so
we're going to look down here in just a second, and we're going to see -- to make sure that this is all bone dry. And if we need to, we will irrigate a little bit and sort all this out. But once the gall bladder is separated from the liver, then we're going to lose a little bit of the ease of the visualization.

That's pretty good.

I think so. Why don't you take a little gander down.

So just so we -- there was a question before as to when we started to do LESS surgery. Well, now we took it to the next innovative step in doing gall bladder resection or cholecystectomies without general anesthesia. And we began this several months ago, and patients seem to tolerate this very well. And do well overall with less operative time, less pain, great cosmetic results, and they don't have to receive the general anesthesia and all the possible side effects that come with general anesthesia.

There you go. Is that a little better on that edge?

Epidural. It's a thoracic epidural plus a local anesthesia right at the belly button -- the umbilicus marking.

Today we're using general anesthesia. This patient is sound asleep, so to speak. And I would anticipate discharge later today. One of the beauties of doing a single-incision operation is that they -- when you put lots of local anesthetic into the wound, they don't wake up with any wound pain -- a little shoulder discomfort, and for that in some patients we will utilize a marking.

Now, I want to show you a nice way that this comes out. I have the cystic duct. I'm pretty close to a cystic duct here. And then what we're going to do is we're going to pop the top off the port, and then it makes it very easy for us to get this out through the port. This is stuck a little bit. There we go. See, I'm grabbing the cystic duct because that's the potential area where it could leak. Now Alexis is bringing the camera back and out. And we're going to pop the top off the port.

Okay, with this I lose my pneumopertoneum; but what I'm doing now is I'm bringing the gall bladder up through the small defect at the umbilicus. And it facilitates this.

Can we have an overhead light on for us, please?

Now, we have so many stones here that what we're going to do is we're going to cut this and -- we're going to cut this off, and we're going to suck the stones and so on out. Ready, Mike?

Yeah. Can we get a couple lamps, Alexis?

As you see here, this is one way to do this.

You see that the bile here is colorless. And the reason for that is that this patient had a bile biliary obstruction that essentially was a hydrops. Now, we've left the pneumoperitoneum in the peritoneal cavity; and that means that if anything was about to spill, it would rather get blown out than it would -- than spill into the peritoneal cavity.

Now what I'm going to do is I'm going to slip the cap back on. We don't have to replace the port, and then we'll go back with our insufflation.

Now, Dr. Rosemurgy, this is one way to do this. For people who are surgeons that like to use a laparoscopic catch bag, they can use that; and they utilize the 12 millimeter trocar that you have on this TriPort.
Right.

And then do the same thing that they usually do. This is just the surgeon's preference.

Right. Now, that's facilitated a little bit as well when you use a SILS port just because you can use the big trocars. Now, that's a little bit of fluid in here; and we're just going to just remove a little bit of the fluid here. Do you see the motion here on the scope? It's all brought about by manipulating the tip -- not by --

You probably -- there you go.

-- manipulating the tip, not by manipulating the handle of the scope. So the scope handle doesn't move; it's just the tip that moves. And we just want to remove a little bit of that -- it's not really blood -- it's just red serous fluid. All right, now we're going to start to close.

So we can review once again the --

We remove all the pneumoperitoneum. Bring the patient over to me, please.

Gas off.

Gas off.

Okay, and so we've been operating now for about twenty-five minutes.

Once again, before you remove the trocar, so let's just review that, that this trocar has two insufflating -- just in case. One of the problems with single incision is that you may have a leak; and so having the second insufflator is very advantageous. So it's really important to just identify that when you have the need, you can always do that instead of inserting another --

Now pulling back on this cord allows us to take this out reallyatraumatically.

Now, if we get the overhead light up here, please, we'll start closing this.

Sometimes the hard part is the incision is so small that closing this up is a little difficult. We can turn the -- Kenny, you can turn the --

So let's just review the --

Here's what it looks like. Here's what it looks like, the laparoscopic view. Let me clear this up for you.

You need to remove the lights.

Let me make -- there you go. I just want to make sure right is right. There we go.

That's what the umbilicus looks like. You can see that we did not violate the umbilical ring. And now what we're going to do is we're going to utilize a single absorbable suture to close this back up, okay?

What would you close the fascia with?

With a single -- with a figure-of-eight absorbable suture.
Maxon? Yeah.

Yeah, it turns out to be a Maxon.

Alexis, will you hold the camera for us while we sew?

Why are you going to do -- why are you doing it? Do you usually do it with a figure-of-eight?

We do it with a figure-of-eight -- one single figure-of-eight suture just to --

"S" retractor, please. Okay, I'll get it.

So it's a little bit of a deeper hole.

Would it help if I got an Alice on that, Mike?

I think it's going to be fine. I think you just got nervous, didn't you?

The question of the viewers is can this be done as a NOTES procedure? A NOTES, by definition, is a natural orifice procedure -- which some people would say that the umbilicus is a natural orifice. But the answer is absolutely "Yes." In some institutions they offer it as a transvaginal approach; however, we are still -- we believe that the instrumentation and technology is not quite there for us to be able to do that here at Tampa General Hospital. However, we are working in the lab in helping develop NOTES. Here we do it with a single incision through the umbilicus; and we have such great results that having to go through the vagina or through the stomach, it just doesn't make sense at this point. Anything to add, Dr. Rosemurgy or Dr. Albrink?

No, I don't think so.

What I wanted to just go over real quick is the toolbox. So what did we use here? We used an EndoEYE 5 millimeter laparoscope with a deflectable tip; it's a 5 millimeter. We used a TriPort, but you can use a SILS port. Both ports are very useful, and we use both for this type of operation. We used a grasper, which is just a normal locking grasper; and a dissector; and a hook cautery. So it's really what every hospital should have and has for this operation. There's nothing really special.

I want to make sure that this is going to look nice. We tethered it a little bit on one of those bites, see that?

I think it looks great. It's not perfect.

Postoperatively the patient -- like Dr. Rosemurgy mentioned -- is going to go home after she recovers; and there'll be no dietary changes -- no particular ones. Just from anesthesia, we tell the patient to consume a clear liquid diet until they feel fully awake and feel back to normal, and then they'll advance their diet as tolerated. There are no real changes; when you think about the function of the gall bladder is pretty much to store bile. So people can live without the gall bladder and that wouldn't cause any changes. If you eat a really fatty meal and it has a large load of fat, they might experience some diarrhea without a gall bladder, but nothing that will be significant.

There was another question about the postoperative activity restrictions. There are no particular restrictions, just like you would have with the normal laparoscopic approach except now you have a single incision in the belly button. We normally would tell people to ambulate -- walk around as much as they can, the more the better. But still avoid constipation, avoid anything that will increase the intra-abdominal pressure. Avoid coughing spells and lifting heavy weight. But other than that, they'll have a sterile dressing that will be placed; and as long as it stays clean, we would ask the patient not to remove the dressing for two weeks until they come to see us. And as you'll
see in a second, we usually place the sterile dressing with vacuum which allows the umbilicus -- we kind of mold the umbilicus back to the way it looked before. And after two weeks, it truly looks like there was no incision that was placed inside this already-existing anatomical scar.

Now, there'll be some discussion about different ways to do this. Some people say you need to make a little smiley-face-type incision on the umbilicus, whatever. But I'm telling you, this is the way to do it because it leaves no scar. Don't make incisions here or incisions here or any -- you need to make them right down in the umbilicus; because if you make them right down in the umbilicus, ultimately it looks like this, which is no apparent scar. When this patient comes back to the clinic, there'll be no apparent scar; and the patient will be very happy. Sometimes the difficulty they run into is that they will go to the emergency department with a subsequent problem, like an appendicitis or something.

Scissors?

They'll say, "Well, I had my gall bladder taken out." And the ER doctors will say, "It's impossible; there's no scar."

Can we remove the eyeoband (sp)? I think we'll see it nicer.

Sure, we'll do that.

Before we put the --

Sure.

So why should surgeons do this operation? Why should they convert from multiple incisions to the single incision? Can we go over those points?

I'm sorry, I missed the question.

Why should surgeons that usually would do laparoscopic cases with multiple incision, why should they convert to a single incision?

Because the patients will like this very much, number one. Number two, because it's a nicer -- it's a little paradigm shift in --

Just trying to get a little more light. Is there a light source on, Kenny?

Yes.

We're trying to show this, and you can see it's awful close for an umbilicus. So it looks just -- what I'm looking at is pretty rough. But it's what an umbilicus looks like. So I'm just trying to get some little better light in here so we can see this just a little better. And the point is that it looks like it did before. You can see that we didn't violate the purple line there, which is the umbilical ring; and there'll be no scar when we're done.

So now Dr. Albrink is going to put a -- he fluffed up a gauze dressing here. And you can see he's got like a little plug here. And then I'm going to take a little Tegaderm dressing and so that I don't put his finger in the dressing so he'll have to stay here for a week. You slide that out, and then we just push down on it and all the air gets squeezed out; and it's essentially hermetically sealed.

There was a question from the viewers whether the patient should be on any particular medications postoperatively.
No.

And the answer is not different -- not very much different than the multiple-incision cholecystectomy; however, we have noticed --

There's the dressing now is on, and that's the way the patient will leave. The patient can shower and do whatever at home. And we'll see the patient -- we'll leave this dressing in place, and this will act as a little form for the umbilicus so that -- to ensure that it looks just perfect. Okay, we'll leave the dressing on until the patient comes back to the office in -- today's Tuesday, so we'll probably see the patient back in the office next Monday/Tuesday.

So back to the pain medication, regarding postoperative usage of medication, we believe that the patients do use less narcotics when they have this single-incision laparoscopic procedure. So there's no change or less usage of narcotics.

What I'm doing now is cutting the gall bladder, which we do routinely. And the intent of this is to make sure that there's not an occult malignancy. We always -- not sometimes, not occasionally -- we always cut the gall bladder in the operating room to make sure that there's no surprises. We don't want to have a week from now a pathology report coming back that there's cancer here. Because if there's cancer in here, we want to know now so we can do what we need to do -- for example, get an appropriate lymph node or whatever. So there are some stones in here. The gall bladder's clear. We're passing this off, and we're done.

So what do we think are the critical points? I think that a deflectable-tip scope is critical. I think that it's very helpful to put local anesthetic in at the umbilicus. I think that's really helpful. And -- I'll just step over here a little bit -- I think that's very helpful. I think that making sure that you get the critical exposure -- that's absolutely, positively key. You have to get the critical view. You have to get the critical view. Safety is number one. Safety is number two. Safety's number three. Safety's number four. If you need to add an additional suture or an additional port, add the additional suture or add the additional port. Do what you have to do. But it's got to be done safely; there's no margin of error here. You can't come back tomorrow and redo it and start over. So we have one shot to do it; let's do it right. Having said that, it's possible to do this operation such that there's no apparent scar and that the operation goals are all fully accomplished. We've extirpated and removed the gall bladder without any difficulty. There's been no blood loss. You saw every step. And we're quite confident that this patient's going to do very, very well. We put lots of local anesthetic at the umbilicus, and that will help with the pain. And there'll be a little bit of postoperative discomfort -- maybe a little "hangover," so to speak, from the anesthetic; but we anticipate the patient going home later today, doing well, and then we'll see the patient back this coming Tuesday.

Dr. Albrink will have some additional thoughts. And, Mike, what do you think are some of the really critical parts of the operation? If you had to pick your like big three, what would be your big three? Like one, two, three. For me, it's deflectable-tip scope; making sure that you make the incision directly in the umbilicus; and then making sure that you get the critical views with safety, safety, safety. Mike?

Well, I would agree with all of those questions. I think the real key about safety is to be certain that the -- a triangle of Calot is not hostile, that you can see the anatomy there well. And perhaps one of my clichés that I use when dictating an operative note is -- which you may have noticed us do today -- is prior to commencing dissection around the triangle of Calot, we take pause to identify the structures of the porta hepatis -- a common bile duct -- and see just where it is; not dissect it, but see where it is and notice at the same time the pulsations of the hepatic artery. But a non-hostile triangle of Calot is a key to the procedure too.
One of the questioners asked why should surgeons do this; and perhaps this may sound a bit glib or flippant, but it's kind of fun. It's a fun way to do a procedure that you do every day, and it's fun to do it this way. Patients like it; and when they're delighted, it's fun for you as well.

Just wanted to add a few advantages in addition to what Dr. Rosemurgy mentioned, is by having less incisions, you have decreased risk of hernia, wound infection, decreased pain; and therefore if they have less pain, the patient is more likely to ambulate -- start walking around immediately after the operation, take a deep breath, and therefore decrease the risk of atelectasis/pneumonia, in addition to having no scar.

For us this kind of an approach is really a small part of a very big picture. We focus our practices and our interests on what we are fascinated by -- which is disorders and diseases of the foregut -- the esophagus, the stomach, the small intestine, the liver, the pancreas, the biliatry, and so on. And this represents a part of what we do. But rather than saying "we do this" and "we do that" for example, we try to do everything from "A" to "Z," but with great depth for foregut disorders. For example, we're not minimally-invasive surgeons; and we're not pancreatic or biliary surgeons; and we're not esophageal surgeons. We're in fact all of the above. And what we've done is we have taken all of the minimally-invasive techniques that we can develop and work to perfect, and we have then applied them to disorders of the esophagus. So we do a lot of minimally-invasive esophageal surgery, including esophagectomies, anti-reflux operations, and Heller myotomies for achalasia. We've done over a thousand anti-reflux operations. We've done more than five hundred myotomies for achalasia, which we believe to be the world's largest data set. And with that we've now done about sixty-five myotomies with this same approach, where we end up with the same cosmetic result with a single-incision laparoscopic myotomy, as this lady accomplished with her cholecystectomy. Similarly we've undertaken, as I mentioned earlier, about seventy single-incision operations for reflux disease; and the patients have been doing very well -- the same exact operation done, just through a different approach. So we don't have to start back to day one to try to collect ten-year follow. We have a lot of ten-year follow with more than a thousand patients that have undergone anti-reflux surgery.

And then as well, this extends off into other vistas -- distal pancreatectomies and splenectomies. Even for patients now with cancer, we will often do with a single-incision or with a laparoscopic approach. Sometimes a single-incision approach can't be fully accomplished; for example, doing a pancreatectomy, because you have to take the specimen out. And so what we'll do then is that we will make the small incision way over in front of the patient's flank, and that allows the incision to be outside of what we consider to be the visual field that a patient sees. If you can get beyond the eye line and beyond the nipple line and then get beyond the anterior axillary line, sequentially those scars will be less and less apparent. And if we can get out to the midaxillary line out here, the patient is going to then get out of the shower, look in the mirror, and not see that scar. It's not uncommon for us to add an additional port or trocar out lateral to the anterior axillary line, in other words out on the side; and the patient comes back to clinic, and we'll take the dressing off the umbilicus or the belly button, and then we'll say, "Let's see -- have a look at that one on your side." They lift up their arm and they say, "Gee, doc, I didn't even know this was here," because it's so unapparent.

Haven't said that, we are able then to utilize these techniques doing numerous operations involving the foregut. One of the beauties of doing single-incision laparoscopy is it also gives you access to all areas of the peritoneal cavity, including the pelvis. So for example, if we were in a conventional situation to do a gall bladder operation with ports in the upper abdomen and then wanted to do an inguinal hernia repair, our instruments wouldn't reach; we'd have to put in more ports or do a hysterectomy. We couldn't reach. You'd have to put in more ports. The umbilicus -- the single-incision approach you just saw -- gives us equal access to all quadrants of the abdomen. And as a consequence, we're now able to do anti-reflux surgery and an inguinal hernia -- to do a hysterectomy and a cholecystectomy, a hysterectomy or an oophorectomy -- removal of an ovary -- and then an anti-reflux operation. And so it gives us great flexibility and great utility to take the breadth of our practice in foregut disorders and apply -- make the depth of our approach to foregut disorders extremely deep. For even esophageal
cancers, reflux, achalasia, liver disorders, liver tumors, patients with (inaudible), hepatic cysts, pancreatic cancer, diseases of the spleen, inguinal hernias, on and on and on and on and on.

We are going to have a national meeting here coming this spring at this hospital with the University of South Florida focusing on this approach for a broad category of surgical problems. And as well we have a number of surgeons that come through, almost on a weekly basis, to learn how to do this here at Tampa General Hospital and at the university.

The hospital has really been very thoughtful about leading this by acquisition of certain equipment. But there's not a lot of fancy equipment here; in fact, almost none short of the deflectable-tip scope. I don't want you to think we could do this operation in Tampa, and you can't do it somewhere else. It can be at somewhere else because we don't use fancy graspers, we don't use fancy cameras. Other than a deflectable-tip scope, everything else we've used here is commercially available; and we're keenly aware of hospital costs and medical care costs. So we try to keep our disposable costs very low. We used a port today; and some people would say, "Well, there's a cost to that." Yeah, but we did it quickly -- which saves a fair amount of money just in OR time. As well we didn't use any disposable equipment; other than a roticulating grasper, everything else is reusable. And so our reusable costs are really quite limited.

As well we're cognizant how long patients need to be in the recovery room and in the hospital, and so we work to get patients out of the hospital quickly. We want to provide perfect care for the patients, and we want to provide it cost effectively and cost efficiently, because we know that nationally that the United States of America can't continue to support this burgeoning and growing healthcare burden. So with that we're conscious of this on many different levels.

We think this gets people back to work quicker. We think that it results in a better cosmetic result. We think it's less pain. We think they turn the corner quicker to get back to the usual and customary activities. We think this is a great idea, and so we have embraced it across the full discipline of what it is that we do in surgery.

And just to elaborate on what you said before about the advantages of single incision with robotics, for example, and you talked quadrants. Just to mention robotics, people -- and especially patients -- get excited about robotics; but with robotics remember, you have like five incisions. It takes about an hour to just set it up, and it just doesn't make sense at this point for general surgery where you have to try to work in different quadrants.

Like Dr. Rosemurgy mentioned before, we have done multiple combined operation with a chole and a hysterectomy, and everything is extracted through the vagina -- or the chole and anti-reflux operation. Before when we started the operation, we said that the best candidate is the one that has no previous incisions, no previous operations; however, since we started back in 2007, now we've been undertaking this single-incision laparoscopy in patients that had previous incisions and have lots of adhesions. So back when we talked before about learning curve, that's exactly what we're talking about. It does take some, you know, a new skill to learn; but it doesn't take long to learn that skill. And you can do the same operations that you used to do before with multiple incisions utilizing the single-incision -- even in patients who had previous operations. We just need to have more practice.

Mike, what do you think?

If you can show us over here on camera here.

Mike, what do you think is the best part of this?

Well, it's unique. It's clearly cosmetically superior. It's fun to do. Patients are delighted; they really are. They come back in the office, and they pull their shirt up, and they go, "This is amazing!" Having said that, I think it
should be said the key to this is to be safe. It's a new and a different way to do an operation. We teach people how to do this. An interesting remark that many of our residents make after doing this -- they say that doing a four-port lap/choly really becomes quite easy. And I think in a way, perhaps indirectly, it makes you a better laparoscopic surgeon by doing things a different way, perhaps with a slight -- higher of degree of difficulty. It makes routine things easier as well.

I think this is the future. I think that perhaps ninety percent of gall bladders can be done this way. There's some people who really don't care about scars and cosmetic things. You know, men don't care. Harry, retired mill worker from Pittsburg, probably doesn't care about scars; he may think they're kind of cool. But some people really care a lot. And for those patients, it's quite remarkable. And I think this is an extraordinary development.

I believe that it will continue to be done on a pretty wide scale basis, and more and more people will do this. Increasingly patients seek this out. We've been sort of surprised to see that. And patients are resourceful. They find out about new developments and increasingly seek this out. So I believe that this is an easily-teachable skill, quantifiable, safe -- and it should remain safe. The bottom line is that it should never be said that a patient was harmed by this technique, and it's incumbent upon all physicians who practice this to practice with the highest degree of safety. It's never a crime or a sin to add more ports if need be.

How about cholangiography?

Oh, cholangiography is very doable this way.

How would you do it?

Well, the way we do it is we use -- through the same umbilical access site, no matter what device we use -- we place a balloon-tip cholangiogram catheter -- a typical Reddick cholangiogram catheter -- and do cholangiography identical to the way we've always done it. It's probably, in my opinion, no more difficult to cannulate the cystic duct this way than with traditional four-port lab chole. So I think we all should do cholangiography more often. But today it would have been pretty easy to do; I think it was a fairly large cystic duct. Sometimes the balloon catheter is difficult to get in; and occasionally, you can clip it in with a clip to hold it in. The idea simply is to not have dye (inaudible). But there's no reason that cholangiography can't be done on anyone. If those who advocate doing routine interoperative cholangiography have at it, it's no more difficult than usual.

In sum, what's the sound bite you want to leave everybody with?

Safety, have fun, do a good job, and an extraordinary development.

And we believe it's a practice builder, right?

On top of what he just said, I want to make this -- I'm not going to jump up and down physically, but metaphorically, I'm going to jump up and down when I say this. It's about no scar. Yes, I agree with everything he said; but this is about no scar. And so when the operation is done and the patients go home and when they come back to see us, we don't want to see any scar. We want to do such a good job, there's no scar. There's no scar. If you've not heard anything that we've said today, this is about no scar. It's also true for the anti-reflux surgery, for the surgery for (inaudible) disorders, esophageal surgery, the liver surgery, and the pancreatic surgery. It's about no scar. When there's no scar, there's no wound to get infected. There's less incisional pain, etc. etc. There's quicker return to functional activities. But it's really about no scar. Patients want it. They want no scar.

Now, like Dr. Albrink said, not everybody cares that much; but some people care a lot. It's about no scar. It's about no scar. It's about no scar. So the acronym "LESS" for laparoscopic single-site surgeries truly represents
that we've taken minimally-invasive surgery and we've taken it to -- if you will -- a new lull because this is less invasive. It's less apparent. It's less of an insult to the patient. That's my take. My sound bite is, "No scar."

Dr. Ross?

I'd like to thank all the viewers for joining this, and hopefully enjoying the broadcast; and we'll see you next time.

Thank you for watching this laparoscopic-endoscopic single-site procedure webcast from Tampa General Hospital in Tampa, Florida.