

**COMPONENT SEPARATION FOR COMPLEX ABDOMINAL WALL
RECONSTRUCTION
ALBANY MEDICAL CENTER
ALBANY, NY
April 30, 2008**

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ANNOUNCER: This event is being sponsored by Synovis Life Technologies. Over the next hour, you'll see the premiere webcast of a component separation for complex abdominal-wall reconstruction, performed by Dr. Jerome D. Chao and Dr. Dimitri J. Koumanis. The surgery comes to you from Albany Medical Center in Albany, New York. In just moments, you'll learn how the component separation is reinforced using Veritas Collagen Matrix, an innovative biologic material which remodels into the tissue it is used to repair. Veritas is a tested, FDA-cleared, and exciting alternative to currently available synthetic and biologic meshes. OR-Live makes it easy for you to learn more. Just click on the "Request Information" button on your webcast screen and open the door to informed medical care. Now let's join the doctors.

00:01:03

JEROME CHAO, MD: Good morning, everybody. My name is Dr. Jerome Chao.

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DIMITRI KOUMANIS, MD: And my name is Dr. Jim Koumanis.

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JEROME CHAO, MD: We'd like to welcome you to Albany Medical Center. Today we're going to be performing a component separation, and we're going to augment the component separation with Veritas. This is a product that is produced by Synovis. We'll be starting now just showing you the abdomen of this patient, J.P. J.P. is a 47-year-old male who had a distal pancreatectomy several years ago. He has a history of COPD, pancreat-- he had some pancreatitis. He also has hepatitis C and HIV disease. After his distal pancreatectomy, he did develop a hernia, which was repaired at the time by the surgeon who had performed the distal pancreatectomy by performing a lysis of adhesions. And they placed dual mesh as a parachute underneath using number two Monosoft. Shortly thereafter, he did develop a recurrence of the hernia. At that point, here at Albany Medical Center, the general surgeons will involve us in the repair after one or two failures of the ventral hernia repairs. And they involve us because of our expertise in the component separation, which is what we're probably going to do today. The general surgeons have already removed the mesh. They've also done the lysis of adhesions for us down either gutter to prepare the patient, and we'll proceed with the component separation operation at this time. So if you see, we have the -- a very good omentum here. In fact, he's gained a lot of weight, which may have been part of the reason why he recurred his hernia. And so he has quite a bit of fat here, and in these cases, we might do an omentectomy to help us gain some more room. But if you look on

either side, they've already gone the lysis all the way down, and you can see here the edge of the muscle, the rectus muscles, that are clearly separated. On the other side, we'll see the same exact thing has been done. We've been working very hard with the general surgeons and very closely with them on these and basically have created the team approach in dealing with these complex recurrent hernias. And I can't emphasize more the team approach, which some people forget, also includes your operating room staff: the anesthesiologists who know what kind of issues are going to go on here and also particularly in -- at Albany Med, we have both Brian and Betty, who help us quite a bit here to make things go very smoothly for us. So one of the questions we'll ask right now is what the peak pressures are for the patient, and it's 23, and we're going to keep an eye on that. Can we have some Kochers, please? The first thing I'm going to do is we take large Kochers, and I'm going to grab the edge of the muscle. And you can see it twitch. Hopefully we're showing that on the camera. And we'll go all the way up and down and get a good hold of each edge. And usually takes about four Kochers or so to get that. And then what I'm going to do is I'm going to pull like this and Dr. Koumanis is going to hold the skin. And I like using the Bovie on this part. And we just kind of check here and make sure we don't have any other hernias or ostemias that could pose a problem when we're getting down to the muscle. So we'll take the Bovie -- one of the things that I do like is the Teflon-coated Bovie, and you kind of find an area to get in.

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DIMITRI KOUMANIS, MD: And as an addition, one of the important things that we always discuss is that it's quite important to get fresh edges, just like in anything else in surgery, so that they coalesce postoperatively. We like to excise all the scar tissue or any sort of rind or capsules that you see form so that you get good take about your opposing edges along the midline and also when we onlay the Veritas, as you'll see Dr. Chao performing in the next little while.

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JEROME CHAO, MD: One thing you don't want to worry about is the edge that we have the pokers on. Sometimes they'll slip and sometimes they'll come off and sometimes they'll tear tissue. And if it does do that, tear the tissue, you know that this tissue is not very good anyway. This hernia has come apart, and there's a reason for it, and that tissue edge is not good. Sometimes you just have to re-grasp to find that muscle. Right now what I want to do is find that fascia, and we haven't even reached that yet. And we're getting there. Sort of peeking out. And one of the things we need to do is try to get down to the muscle pretty quickly. We see a lot of people going out and out and out and leaving a lot of fat on this muscle. You really don't need to do that. Just a little bit of fat on the fascia is fine, but we're going to take off that fat to clear things off anyway so that we can do our component separation. One of the things that Jim wanted me to mention today is that very often we'll perform a component separation through separate incisions and do what's called a minimally invasive component separation. It still requires you to do this dissection, and I'll show you in a few minutes how we do that other technique. And see, there's a lot of scar tissue here. And so far, I like what I'm seeing in terms of the fascia and the quality of the tissues. You kind of sweep across so that you don't get into the fascia, very similar to when we do our tummy tucks.

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DIMITRI KOUMANIS, MD: Now, he's a gentleman that actually does not have a huge

amount of subcutaneous tissue, so I think he bodes well for this type of method where we're going to sweep across. If you do have a large fat pad or subcutaneous, I think that's the type of patient you might want to consider not undermining this skin, because you can get increased chance of skin breakdown and soft-tissue breakdown. But he's got a pretty thin subcutaneous here.

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JEROME CHAO, MD: The area where you get most of the breakdown when you do get breakdown is where I'm cutting through now. Dr. Dumani at Northwestern University does advocate leaving these periumbilical perforators in this region because that ends to be where the breakdown occurs. Today we're not going to do that because we've decided that we are going to reinforce this patient with Veritas, and sometimes by having that tissue attached there will get in the way of placing our Veritas, which is a detriment to the situation. But it's clearly a very good concept if you're not going to be augmenting. But in our experience here as well, that's where we are ending up with tissue loss. So this is just a preference. I like going all the way up and down instead of working in a hole. You can see how tough this tissue is. We've already increased the Bovie. That was probably one of the drain sites from his pancreatectomy. And that's why that was so scarred. Then I just take another Kocher, please. And all the while, making sure we protect the bowel. In this situation, you can see that the general surgeons have -- I like blaming them, because they're my friends -- they've gotten into the muscle. But that's okay, because we're going to be doing that as well. But just make sure you grab on to that anterior fascia so that the proper dissection can be performed.

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DIMITRI KOUMANIS, MD: This patient's fascia looks like it's in fairly decent condition, as you can see.

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JEROME CHAO, MD: Okay, so now we'll go back to the center portion. Give me the lights a little better. And again, sweeping across, getting those bleeders when you can so that you don't get into the fascia. And here, in this patient, in patient J.P., you can see the edge of the -- you see that? -- the edge of the rectus very readily. And I'll show you a trick that we use to determine where the edge of that fascia is so that we can perform that component separation, and that's another drain site.

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DIMITRI KOUMANIS, MD: Also quite important -- this may be something simple but not to overlook -- is always come to the O.R. with these patients with having a few units cross-matched. You never know what you're going to get into, although it's very rare. They do trickle down at the end of surgery postoperatively, and sometimes postoperatively, they need a transfusion, but not always. But...

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JEROME CHAO, MD: Now, if we had a -- the need for more skin, we would go ahead and dissect further down. We may still dissect further down, but that decreases your blood supply to your skin flap and will also increase the problems that you're going to have postoperatively. So now what we're going to do is come to the other side.

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DIMITRI KOUMANIS, MD: And just to add, your -- most of your skin here at the top, obviously, comes from the intercostal perforators coming through, and that's why Dr.

Chao has actually stopped right here. And I can feel the costal margin over here where he does not want to -- if he doesn't have to -- dissect more.

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DIMITRI KOUMANIS, MD: Okay, now we'll repeat the same thing on this side.

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DIMITRI KOUMANIS, MD: Can I have the Kochers, please, Brian? Another one, please. Looks like it's here. Let's get another one. We got one here, which is good. Okay.

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JEROME CHAO, MD: And we'll get started like this, and then we'll add the Kochers as we go along.

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DIMITRI KOUMANIS, MD: Yep. Okay, can I have the Bovie, please? And always keep in mind of that bowel. It likes to poke in there.

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JEROME CHAO, MD: And you see how he's going straight down. The mistake that's made is people start heading out already. Even if we go through here, it's all right, because this tissue will be gone.

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DIMITRI KOUMANIS, MD: And I'm already here at the fascia. I can see it. A little bit of finger fracture as well just to get you along these fatty plains is okay. Yep.

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JEROME CHAO, MD: Now, one of the things -- while we're here, this tissue here is bad tissue, and we're going to lift it up right now. But a lot of people -- Kocher, please -- will put this tissue together. And that's why the -- that's part of the reason why these recurrences occur is they're putting bad tissue together, just scar tissue that's going to stretch. Another thing I want to mention is that we are actually here for the prep and drape of these cases. We help them with that. The prep has to be pretty wide; all the way down to the table is what we do.

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DIMITRI KOUMANIS, MD: Use your hands to sweep that bowel away.

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JEROME CHAO, MD: From the xiphoid down to the pubis is where we'll prep them, and that just gives us room to do what we need to do.

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DIMITRI KOUMANIS, MD: So this side is very -- this is probably where a drain site was, too, or part of the infection, because it's very scarred down, as you can see.

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JEROME CHAO, MD: Just going to adjust the lights a little bit.

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DIMITRI KOUMANIS, MD: Thank you. Can I get another Kocher, Brian, please? Yep. Let's get this over here, give us some traction.

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DIMITRI KOUMANIS, MD: Here's the umbilicus, and what we'll be doing now is detaching the umbilicus. You have to stay down low because you don't want to leave epithelial cells to create a cyst underneath there. I've seen that happen before, and they have persistent drainage from their wound. And despite dressing changes, sometimes I've

gone in there and in fact found -- found the bottom of the umbilicus sitting at the base of the wound, kind of the bottom of the bowl right there.

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DIMITRI KOUMANIS, MD: Here's where he had the --

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JEROME CHAO, MD: So here's our umbilicus, and we're going to come across it.

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DIMITRI KOUMANIS, MD: Watch the scar. Here we go. Okay. Now we can keep working down. Let me just reorganize here. And Dr. Chao is showing me the plain here, because it's quite evident where I need to go. So we get into a good plane again.

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JEROME CHAO, MD: So now we're coming toward the inferior aspect. We've got the bladder down here, but I think we're far away enough from it that we're not going to run into problems. We're going to clear this area off because the Veritas is going to sit down this low, in fact. It'll come right across here.

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DIMITRI KOUMANIS, MD: All right, let's change. We don't need these over here. Let's move them over here. Always keep a mind on your bowel, always wants to sneak up there. Mm-hmm. Just add that.

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JEROME CHAO, MD: We'll just come right across the bottom here. We're going to have to sew. See, that's tissue.

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DIMITRI KOUMANIS, MD: Right across there.

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JEROME CHAO, MD: You see that glistening white fascia under there, that's the good stuff. Always make sure you get these. DeBakey. All right. And then we're going to go up into the top and do the same thing at the xiphoid.

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DIMITRI KOUMANIS, MD: I pass the wand to you again. Just bring this suction behind you here.

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JEROME CHAO, MD: And we have some of it done. And basically, what we do up here is we want to get enough so that we can put the Veritas in and also get good sutures. And here's our rectus muscle. And you see the contraction of the rectus muscle is up and down. And then as you get further over, you'll either find no contraction or you can see the oblique contraction, which is what we -- is where we want to be. Okay. Another way is to feel underneath, and you see, here's the muscle. And there's our external oblique plane there. Now, in order to do our components operation, we need to cut the external oblique fascia, and that'll allow us to accordion this tissue over. If you look at this tissue, we're getting to the midline here. We are going to cut off a fair amount of tissue -- here's our midline -- and so there's going to be a tight repair. If I can go to this side and show you with some Kochers, we'll show you what the repair would be and if you were not to do an adequate debridement. And we'll show you how that is one of the pitfalls of the surgery, where you think, "Oh, I can get this closed without doing anything." So you kind of take this tissue and you bring it over. Sure, that looks like it's going to close, but this is

all scar tissue here on the edges.

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DIMITRI KOUMANIS, MD: And this is already tearing.

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JEROME CHAO, MD: And you can see how ratty this is and how it's going to tear. This area here has no muscle. The muscle's going to be back here. And we are going to debride that in a few minutes to show you how we need to get to bleeding, healthy tissue, okay? So right now what I'm going to do is do the actual component separation, creating a muscle flap here. And we pull this taut. I know where we are at this point, and you can come down to about this level. And we go ahead and make our incision with the Bovie by sliding it. What I'm going to do today is I'm going to go ahead and get hemostasis, because you do cut some muscle in the technique. But I'm going to go, and you see how already we're gaining length by creating this muscle flap. I hope that's coming out well on the video.

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DIMITRI KOUMANIS, MD: And good counter-traction obviously, with any surgery, is important.

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JEROME CHAO, MD: Good counter-traction. You see how it's just popping right open. Now, if you've done this wrong, you're staring at bowel. And we look and we're like, whew. We're okay. But no, we knew we were okay. Over here, I want to get a little more tissue off. I'm sorry, could you just pull up on there? A little bit of counter-traction. Counter-traction here is so helpful. And -- thank you. Thanks, Betty. And we're at the ribcage. You can go up above the ribcage and continue dissection if you need to get extra tissue at the superior portion, and I'm not certain that we are going to need to, but we can always do that. But now, if you look at this pull and we take a ruler, and you can do a little blunt dissection here. Can I have a ruler? Look how much gain we've made, 4 centimeters. So we're going to be able to close by getting the same amount on the other side. It's at least an 8 centimeter gap. And if you try to imagine the amount of tissue that we're going to take off, we're probably going to not need quite that much, but that's the gain that we're going to have. Again, if you needed to gain more skin, you would dissect this tissue if you wanted to all the way down to the table. We try to avoid that because of blood supply issues towards our midline. So here, we don't have that big of an area that the blood has to travel to get to the edge of the hernia. All right, so now we're going to do the same thing on the other side, protecting the bowel with the omentum, and we'll clean this up a little and we'll do the same thing.

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DIMITRI KOUMANIS, MD: Go ahead, Jerry, you're right there.

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JEROME CHAO, MD: All right. And right now, I'm just going to get us a little bit more room and a little hemostasis. Okay. And then I'm checking. Now, I'm -- let's see if that shows up on the camera. You see the contractions of the rectus muscle, and then as I get here, nothing. So we know that this is about where we want to be, I make that little hole. Dr. Koumanis is going to take his Metz and he's going to do the test where he slides all the way up and then slides medially.

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DIMITRI KOUMANIS, MD: So it's sliding up very nicely.

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JEROME CHAO, MD: Yep, and then we'll check medially and it does stop. Okay. So we're going to go ahead and make the rest of the cut, and this is just the top layer. And you can see how these contractions are oblique, being our external obliques. And then I'm just going to cut through here as well at the bottom aspect of it. And there we have a very nice clean cut. So we have about 2 centimeters now, and then as Jim pulls and, you know, sometimes you have to use a little judicious finger dissection. Yep. And get a little bit of hemostasis, and then we'll take a look with our ruler and probably get about 4 centimeters on this side as well, which we do, 4 to 5 centimeters. So now if we can show again our release -- mm-hmm. Flip these over. Yep. Get this one in. And then before, we had a lot of tension, now we have -- we're going to have no tension once we debride off that tissue.

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DIMITRI KOUMANIS, MD: Yep, it's going to be fine.

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JEROME CHAO, MD: It's going to be fine. Good. So now I'm going to take me curved Mayo scissors and be old-fashioned about this. Some people would use a Bovie, but I want to see good bleeding. And there's the muscle, and that's good. I want there to be muscle. And there's muscle. And don't be afraid to cut into the muscle. The muscle itself has no strength, but the fascia above and below it do have the strength. But you can see these thinned areas that I'm cutting off, and you'll start seeing some good bleeding coming off of it, and of course, all the while getting rid of the scar tissue, protecting your bowel. Be good to the bowel and it'll be good to you. Be good to your nurses and techs, and they'll be good to you. Right, Betty?

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DIMITRI KOUMANIS, MD: Betty? Right, Brian? All right, so let's continue.

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JEROME CHAO, MD: And yes, you can do this with the Bovie, but you're creating thermal injury, and I'd rather cut it and then go after the bleeders and spot weld.

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DIMITRI KOUMANIS, MD: If you want to come in on this, you'll see some nice good bleeding. If you'd lean back, Dr. Chao, so we can show them this bleeding edge -- bleeding edges here.

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JEROME CHAO, MD: There's our bleeding edges. And I'm going to do some hemostasis. Our sutures are going to do a fair amount of the hemostasis for us, and you see that good muscle contracting. And here we see the fascia and fascia. And that's where our sutures are going to need to be. Now, this part, if you look at this, I'm not super happy with that, so I am going to cut off some more tissue at that location and make it an even more bloody mess. But it's not a lot of blood loss. You don't have to be afraid of losing a little bit of blood here. And so we have pretty good tissues, good contraction of the muscles. Another secret at the end of this debridement is to have the anesthesiologist go ahead and paralyze the patient. We'll see if we need that. And so --

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DIMITRI KOUMANIS, MD: And also, you might want to instruct the anesthesiologist not to use any nitrous, because the bowel just gets inflated.

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JEROME CHAO, MD: Part of that team approach. Okay, so now we have this side to do. So watch out for the bladder, and I don't see it.

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DIMITRI KOUMANIS, MD: I think we'll start here and then we'll come back after. This stuff here is pretty ratty. A little less on that one.

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JEROME CHAO, MD: Yep. All right. And we're going to see bleeding and muscle.

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DIMITRI KOUMANIS, MD: There we go.

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JEROME CHAO, MD: And all the while, watching our bowel and getting some good edges here. And that's beautiful. That's what we want to see.

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DIMITRI KOUMANIS, MD: These are all --

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JEROME CHAO, MD: Don't be con-- you know, we're never conservative. We can get this closed is what we think. And there's some bleeding there, that's good bleeding. We'll get that.

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DIMITRI KOUMANIS, MD: Suction.

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JEROME CHAO, MD: DeBakeys.

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DIMITRI KOUMANIS, MD: There it is.

JEROME CHAO, MD: There we go. That's the kind of pulsatile bleeding we want for good healing. Okay, so at this time, we're going to start bringing this together, and I need Kochers. And we're going to use, in this case -- this is a non-infected case, so we're not going to use absorbable stitches, we're going to use permanent sutures. If we can have a number two Monosoft, that'd be great. Number two nylons, or whatever your preference is, and that's his range. And then Kochers for this side, please. We see the good muscle edges here. Looks like we have to still debride this. Another --

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DIMITRI KOUMANIS, MD: Yeah, that looks like it still needs -- can we have the curved Mayos, please, again, for Dr. Chao? Okay.

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JEROME CHAO, MD: Good bleeding there.

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DIMITRI KOUMANIS, MD: There we go. Excellent.

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JEROME CHAO, MD: All right, we'll take the big fish. Sometimes when the bowel is spilling out, we'll need to put a towel in here to keep things in, but very often the big fish is adequate for us. And so what we're going to do is we're going to start closing this. Can you take down these adhesions? That's all liver there. Okay. All right. So then we'll begin our repair. Some people like burying these knots, but because we're using the Veritas, it's not necessary. And so what we do is we protect the bowel beneath and we come up high.

Stay high, and that's not an adequate bite.

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DIMITRI KOUMANIS, MD: So a centimeter into -- deep into the fascia.

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JEROME CHAO, MD: And you can use your Kochers to help you.

DIMITRI KOUMANIS, MD: And 1 centimeter across all the way down.

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JEROME CHAO, MD: So 1 centimeter/1 centimeter rule. And we know it's good tissue and that we don't have to go further back because we've debrided it properly to get us to that point. And then we'll go ahead and tie it like that.

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DIMITRI KOUMANIS, MD: Straight scissors for me, please, Brian. Good sliding knot there, two-handed tie, always more accurate.

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JEROME CHAO, MD: About eight knots. And one of my mentors always said if you don't like the stitch, what do you do? And the answer is you take it out. And so if that happens or the stitch breaks, what do you do? You just do another one. And then so we'll go 1 centimeter away, getting both layers of fascia. Okay. That's my knot there. There you go. So figure-of-eight sutures is what we're doing, non-buried. A centimeter away.

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DIMITRI KOUMANIS, MD: Straights for me.

JEROME CHAO, MD: Then one of the tricks you can do is just hold off the tension for me. And again, granny knot, see if this comes down. Pull up and tighten that up.

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DIMITRI KOUMANIS, MD: Pull this one?

JEROME CHAO, MD: Yep.

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DIMITRI KOUMANIS, MD: Is he relaxed? Do you want him relaxed?

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JEROME CHAO, MD: Is the patient relaxed?

DIMITRI KOUMANIS, MD: Can we get the patient fully relaxed if he's not already, please? We'll get him relaxed to help with the closure, decrease the tension

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JEROME CHAO, MD: Okay, take that one off. And hold it right here. Okay. Hold it right there to give the Kocher?

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DIMITRI KOUMANIS, MD: You want to put a Kocher in that one?

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JEROME CHAO, MD: Right there, yep. Okay.

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DIMITRI KOUMANIS, MD: So again, removing the tension for your partner here. Sliding granny knot.

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JEROME CHAO, MD: Tension, tension.

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DIMITRI KOUMANIS, MD: There's a little bleeder after that we'll have to get.

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JEROME CHAO, MD: Suture scissor.

DIMITRI KOUMANIS, MD: Suture scissors. Straights, okay. They're right here. Brian, can you untangle those, please? Straights.

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JEROME CHAO, MD: I guess while we're doing these sutures, it'd be a good idea to talk about why we use Veritas versus a lot of the other products that are out there. You probably noticed that there are a lot of products out there, and I'm not sure if I can name them, but one is the dermis -- acellular dermis from a human. They also have a similar product from a porcine source. And this particular product is a calf pericardium source. The reason we ultimately chose this product was through trial and error, in fact. The human product, though a very good product, was causing some problems for us. One of them, which is a known problem, is seroma formation. And it really, in my hands and in Jim's hands, there's really no way around these seromas. And I've got to tell you, dealing with the seromas afterwards can be quite a problem. It's a hassle for the patient and also is a problem for the physician as well and may result in additional surgeries. So after a while, we started looking at other products because everybody says that their product is better. And one of the first products we looked at -- and I just messed up that suture, so we'll cut it out. One of the first products we looked at was the porcine product. And that had with it its own problems. One of the things was yes, it did -- right here -- it did cause seromas as well. Another thing was that the processing and the packaging, even though it was very convenient in that it did not need to be reconstituted, it came off the shelf -- alloderm, you have to sometimes wait because we have to reconstitute it and it has to be kept at the blood bank, frozen. And it does become inconvenient at times. The porcine one was processed and packaged in a liquid that had a horrible odor, which was completely unacceptable to our nurse, besides us, and because of that and because of the fact that our seromas were not going away -- that's another stitch -- we started looking for other products, trialing products week after week, month after month. We finally settled on Veritas after a number of cases where we ended up not having those problems. Our seroma rate seemed to go down, and in those cases where we did run into some problems -- now, you can see, I'm just checking the sutures, making sure we haven't caught any bowel. The ones where we did run into problems and were having a dehiscence, backing over Veritas was very easy and very fast.

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DIMITRI KOUMANIS, MD: The granulation tissue, it was remarkable, and we have case studies that show that it quickly granulates, and it's very easy to use with the white or the black sponge over top of the vac machine, which helps bring the granulation tissue on top of the Veritas over an integrated even quicker if you have a skin breakdown. That's what we were talking about before, a soft-tissue breakdown, which occurs often enough that it's a hassle in these surgeries, this component separation. So although anecdotal, we -- at this point, we did feel very strongly, clinically our experience did change. And we hope to get that series out.

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JEROME CHAO, MD: And so we've been at this point utilizing Veritas exclusively for our component separations and ventral hernias for the reinforcement. Scissors, please.

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DIMITRI KOUMANIS, MD: Scissors. Cut that?

JEROME CHAO, MD: Yep.

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DIMITRI KOUMANIS, MD: Ultimately at this point in time, it does take a surgeon to behave the way we did and try all the different products and be comfortable with it. We are very comfortable with Veritas. The way it handles, it's easy to take suture bites, it's strong, it -- it also is easy because it comes -- like Dr. Chao was saying, comes out of the package right away. So if it's in an unexpected-finding type of case, it's easy to get it ready and going. You're not sitting around.

00:42:29

JEROME CHAO, MD: They have a number of sizes that are available for us, and what the representative will do is get you -- these cards, these sizers that are on a ring, and that'll allow you to pick which size is most appropriate for you. And so we try to grab as little muscle as possible, because the muscle, all it does underneath there is get necrotic. And so we'll try to just grab the fascia only in these cases as best as we can. Sometimes it -- sometimes we have to grab some. But you see how we put the Kochers on so that it's mostly -- it's mostly fascia. So you see how things have nicely relaxed so that despite the tissue that we took off, we have very good advancement of these tissues. This patient does have MRSA on the skin, so we did adequate prep and we also prophylaxed the patient with vancomycin.

00:44:29

DIMITRI KOUMANIS, MD: Watch the needle. Watch you don't jab yourself with the needle there.

00:44:38

JEROME CHAO, MD: Thank you. So we've done the count since we're almost closed. The only thing we have in the belly is the fish, so our counts are correct. Standard protocol in terms of counts. Don't want to leave any laps in there, and we have to make sure that the general surgeons have not left any laps in there. Sometimes they do a bowel resection and the pack the belly. Make sure all those things are not there.

00:45:05

DIMITRI KOUMANIS, MD: Let's check our repair underneath, and nothing is being caught by our sutures. Even though we're doing each suture under direct vision, no blind shots.

00:45:18

JEROME CHAO, MD: Sometimes people will start from the bottom now, but I think that we have enough laxity and enough room that we'll just keep going down. We'll see if we have to do that, but not always necessary. So here at Albany Medical Center, we get a fair number of these. We are a level-one trauma center, and like this patient, they're not all traumas, but a fair number of our traumas do end up with hernias, and we will provide them with a component separation.

00:45:43

DIMITRI KOUMANIS, MD: And our general surgeons are very busy surgeons here as well.

00:45:45

JEROME CHAO, MD: Very busy, talented general surgeons here. In fact --

00:45:52

DIMITRI KOUMANIS, MD: We work very close with them, and we are part of the same department.

00:45:58

JEROME CHAO, MD: That team concept is very important. And right now the general surgeon who started this case is doing a gastrectomy while we finish this case. And you kind of grab those edges so that you're not grabbing as much muscle. Let's get that hidden better.

00:46:16

DIMITRI KOUMANIS, MD: Yep. So we'll just back off for a second until we get things organized here so we don't bag any bowel.

00:46:23

JEROME CHAO, MD: There we go.

DIMITRI KOUMANIS, MD: There we go, and Dr. Chao brought it great. Okay.

00:46:43

JEROME CHAO, MD: I want to reiterate what Dr. Koumanis had mentioned about trying things yourself. The only reason we settled -- not settled, but chose Veritas was from truly trial and error. And I guess technically you can say "settled" on it, because there is no perfect product out there, would you agree?

00:47:03

DIMITRI KOUMANIS, MD: I agree fully.

JEROME CHAO, MD: There's no perfect product out there.

00:47:05

DIMITRI KOUMANIS, MD: Each one has its own setbacks.

JEROME CHAO, MD: And strengths.

00:47:07

DIMITRI KOUMANIS, MD: And strengths, yep.

00:47:11

JEROME CHAO, MD: And the kinds of strengths that we wanted -- not just durability strengths, but other strengths that we wanted were fulfilled by the Veritas. What we're doing with the Veritas in these cases is decreasing -- we're reinforcing the suture line, which is very important to us. Not only that, we're releasing tension on the suture line. So for example, after the surgery, that the patient's coughing, some of that stress can be relieved by the Veritas instead of only this incision, which could be a problem in terms of it coming apart and --

00:47:57

DIMITRI KOUMANIS, MD: Now, some people will overlay, some people underlay, some people will sandwich, and I don't think anything's been proven yet. Now, when you have to bridge the gap, we recommend underlaying and parachuting like Dr. Chao was saying. In this case, we do not have to do that, as we will get this patient closed.

00:48:14

JEROME CHAO, MD: Right now we're getting him closed primarily, so the Veritas is an adjunct to this repair.

00:48:21

DIMITRI KOUMANIS, MD: And anecdotally, we believe that underlay and overlay, in this scenario, is probably equal. And the only difference is that the overlay is technically much quicker and you visualize every bite.

00:48:36

JEROME CHAO, MD: It's much easier. We do add something to our overlay which we'll show you. It's a little -- it's quick to do and I think it helps us. All of this is, unfortunately, at this point, anecdotal. Nobody has done a prospective randomized control study of any of these products that definitively gives us the answer that we want. So we're almost closed here. We have the bottom third of the incision to do.

00:49:13

DIMITRI KOUMANIS, MD: But there is a --

JEROME CHAO, MD: Do you want to check the peak pressures right now? Which is 26. The patient does have COPD, and now that we're closing him -- actually, any of the patients. Some of these patients can be smokers, some have asthma, et cetera. When the bowel goes back in, it has to push on something. Some of it is pushing on the repair that we've done. Some of it is pushing up on the diaphragm. And so we -- we do advise these patients that they may be intubated after the surgery. The peak pressures give us an idea of why. So each of these patients should have a reservation for an ICU just in case. One of the complications for any complex hernia repair is abdominal compartment syndrome, so the ability to check bladder pressures is also important in these patients. The way this is closing, just from experience, we'll probably be able to extubate this patient after the surgery, which is, in my opinion and in Jim's also, a huge benefit. The patients who remain intubated -- and they're sometimes intubated up to two weeks or longer after the surgery -- they're not getting the quote-unquote "good" nutrition, you know. And if that kind of situation does occur, I would recommend, if it's possible, to start nutrition as soon as possible.

00:50:51

DIMITRI KOUMANIS, MD: And preoperatively, make sure that all their parameters, their transferrins, their prealbumins and so forth are at adequate levels, too, because then you're behind the eight ball already, and that's just General Surgery 101. And --

00:51:05

JEROME CHAO, MD: So what do you want to do, just keep on going, I think. Because I think we're going to have adequate protection here.

00:51:08

DIMITRI KOUMANIS, MD: I think we're pretty good, yeah.

00:51:10

JEROME CHAO, MD: So we didn't have to do an omentectomy, which was good.

00:51:13

DIMITRI KOUMANIS, MD: It helps, as everyone knows, to keep the omentum if you can. It'll keep the adhesions lower.

00:51:22

JEROME CHAO, MD: The omentum is helping us here.

00:51:25

DIMITRI KOUMANIS, MD: Keeping the bowel down and if you ever have to come in this abdomen, God forbid, you can see that extra protection.

00:51:38

JEROME CHAO, MD: So what was that peak airway, 26, right? Yep. And it was 23 pre-op? Or in -- for our surgery. So 23 to 26, we're happy with that number. And he's relaxed right now and it's possible that -- it would be very unlikely that this was going to go up,

that peak airway pressure.

00:52:04

DIMITRI KOUMANIS, MD: Since we're almost closed and the tightest part of the repair has already been experienced, so -- cut, please.

00:52:19

JEROME CHAO, MD: So probably another one or two and then we'll switch over to a malleable. Yes. Sure. Actually if you could -- while we're doing this, if you could show the placement of the Veritas on the field. As you can see, it's in a box which is on our shelf. We keep it on the shelf here, so it's no phone call to -- no phone call to the blood bank, no phone call to anybody. It's just on the shelf, and what Betty has done is she's gotten us the appropriate size, which is our 12 x 25 that we're going to use on this one, it's a very long one. Also, there's an indicator strip on the outside. That's a heat indicator, and we always take a look at that, and Betty will tell us what color it is.

00:53:08

BETTY: White.

JEROME CHAO, MD: It's white. And red is bad. Red would mean that it's been subjected to extreme in terms of heat, and we don't want that. And then we'll go ahead and open the box, because we know we are going to use that particular one. We checked the expiration date.

00:53:28

DIMITRI KOUMANIS, MD: Another note with Veritas is a lot of these bioprosthetic materials claim to have vascular integration, and some of them do. Veritas, we have, even in our own samples here in the hospital, shown that it does vascularly integrate and gets revascularized by tissue. And we have those on slides when we give a tour of talks.

00:53:49

JEROME CHAO, MD: Expiration date's 4/2010, and you see the foil that she has. And using standard technique, she's going to peel that. And Brian will take it from her, so that inner pack is the sterile portion. And then he can open that up and show you the sheet of Veritas that we're going to use.

00:54:40

DIMITRI KOUMANIS, MD: Okay, so we'll probably go to the malleable next. Scissors.

00:54:59

JEROME CHAO, MD: Eight knots. Okay, so we're going to take the fish out.

00:55:05

DIMITRI KOUMANIS, MD: Dr. Chao, watch out one second.

00:55:07

JEROME CHAO, MD: And that is out. Just check again. And we have nice omentum down here, and we're going to use the malleable at this point, which is completely external. So our count is completely correct now without the --

00:55:22

DIMITRI KOUMANIS, MD: So we'll move these down a little bit.

00:55:26

JEROME CHAO, MD: And again, you have some bleeding from the muscle, but that's going to be taken care of by our sutures. And sometimes you just have to move the malleable out and put it back in again for each of these sutures. I use a sweeping motion. And I know that we started suturing up top from the left side of the patient's body, but

we've found that suturing from -- for some reason from the right side of the body is easier. Probably has to do with most of us being -- a lot of us being right-handed here. Stop.

00:56:13

DIMITRI KOUMANIS, MD: Did it pull through?

JEROME CHAO, MD: Nope.

00:56:16

DIMITRI KOUMANIS, MD: Got it.

JEROME CHAO, MD: Suture scissors.

00:56:19

DIMITRI KOUMANIS, MD: All right, here we go.

00:56:31

JEROME CHAO, MD: And at this point, you're kind of assessing everything as you come along, and we're very happy with how things are going. Now, most of the products don't have a size that's going to be big enough to span this entire length. And I'm not worried about that. The important thing for us to do is you can see where the majority of the tension is. It's right here in the middle where we've done that component. This bottom part is less important. It's quite loose, as Dr. --

00:57:00

DIMITRI KOUMANIS, MD: So we're putting the last couple stitches in and then we're going to tie, I think. So we have tension on it and we're -- we have no bowel underneath this. And he's going to use -- yep -- one more to go across. And then we're going to go ahead and tie these. We have tension on it. Yep. And then we'll go ahead and start tying them. Cut. You okay if grab that one?

00:58:12

JEROME CHAO, MD: Get a hemostat, please, Brian. Put these both -- just clamp these two together.

00:58:30

DIMITRI KOUMANIS, MD: It's the perfect temperature today in here.

00:58:32

JEROME CHAO, MD: Yeah.

DIMITRI KOUMANIS, MD: It's a good day. Go ahead.

00:58:52

I do warn the patients that after the component separation surgery that they're going to have a bulge. Not that they're going to have a hernia bulge, it's just different. It's going to kind of have a pot-belly bulge because of the release that we've done. I would say every patient gets that. It's a kind of fullness all the way around, but I think it's the -- an important point is that the patient has -- one of the reasons we do the surgery is not just because of the hernia but the pain that they have. And some high-risk patients want the surgery at any cost, including loss of life, which is an interesting concept. Obviously there are patients that we do not operate on because of the high risk that they have medically. Okay, so we'll take a look inside now, and you can see the component that we've done. This is what it's going to look like when you're done.

01:00:08

DIMITRI KOUMANIS, MD: Let's just show, now that it's all the way into the midline, how much change we got. So we got 6 centimeter advancement on this side and

approximately the same, it looks like 5.5-6 on this side as well.

01:00:23

JEROME CHAO, MD: So almost 12.

DIMITRI KOUMANIS, MD: So almost 12 centimeter advancement, and that's what they -- if you read the books, they do talk about that, 10-12.

01:00:30

JEROME CHAO, MD: So we get a little bit of hemostasis and we'll be doing some irrigation. And these bleeders are important to get. These patients can ooze quite a bit after surgery. We do place drains, and we'll do that after we place the Veritas. One thing you'll see now on the skin is we have portions of the hernia sac, and we are going to cut those out again with the curved Mayo scissors. Can I have a -- tooth forceps, please? And that will also allow us a better edge. This kind of tissue is dead, it's all scar tiss-- it's not dead, but it's scar tissue. And it's not going to heal quite as well, so we're going to make a fresh injury out of this, get these growth factors going. Rev things up again so that the patient has a better chance of healing this. So there's that, and that's a little thin there, so we may be taking that out. We have the same thing over here, I want to take out this capsule for the hernia. There's this hernia sac that's -- oh, you okay? And you see now, we're getting the bleeding tissue. And we do that. And so we have good tissue on both sides. We're not going to cut it now, but after we place the Veritas, we may be taking off some of this attenuated skin. But that's delayed skin, so it should have a good blood supply. We'll take the irrigation now, please. Yeah. We'll go ahead and irrigate now. I have a preference of type of irrigation. This is a betadine-tinged irrigation. I know it doesn't make sense, but we have studies that show that a low percentage of betadine irrigation will not affect our wound healing and will not kill the cells necessary for wound healing but will decrease your bacterial counts probably mostly what we call voodoo in surgery, but it's working for me and it's not harming the patient unless they're allergic. And so now we'll clean off the skin, tidy things up, and then we're going to go ahead and place the Veritas. Okay. And we want to get all these clots off. It all harbors bacteria. Okay. So once again, a wide view shot, let's see what we've stirred up with the irrigation, which is also what we do the irrigation for. And you see that we both dab and rub, because we want that bleeding to get stirred off, even if there's a clot on the end of a vessel. Once he increases his pressures, he's going to knock those clots off, so we want to get those now.

01:03:52

DIMITRI KOUMANIS, MD: And I'm a big believer, if you have a lot of little bleeders and clots, instead of buzzing heat -- and Dr. Chao's not going to have to do much buzzing here, so here he's okay, but if you do, spray it with a little bit of [indistinct], just put some wet lap pads for a few minutes, and that can usually slow down a lot of the bleeding so you don't get this char with too much Bovie-ing.

01:04:12

JEROME CHAO, MD: Another thing you can use, bipolar. All right. So you see the edge. The edge here, the edge here, the edge here, and a repair down the middle. As we go along, this will stretch out more and decrease our tension here at this critical area where the hernia was. This probably is less than ideal in terms of the muscle, but that will not affect our repair. I think we have good tissue to good tissue, and you do see some areas where the fascia is apart, and that's what the Veritas is going to help us with. What

we theorize and what some animal studies have shown is that these replacement matrices, or the matrix, will become fascia. So we'll take the Veritas, please.

01:05:01

DIMITRI KOUMANIS, MD: That's a little lap pad in there, huh?

01:05:06

JEROME CHAO, MD: Is it?

DIMITRI KOUMANIS, MD: Yeah.

01:05:09

JEROME CHAO, MD: There's sutures, old sutures.

01:05:19

DIMITRI KOUMANIS, MD: A little weird. I'm just seeing some lap pad in that.

01:05:26

JEROME CHAO, MD: Okay, so this is our Veritas that's been prepared. You don't have to do this, but I just rinse it a little bit in the saline before we put it in. Just a quick rinse, just a quick rinse. And then what we'll do is, you try not to contact skin, because even though we've prepped the patient, the skin does have bacteria that will regrow. And so you see how easy this is and you see how durable it is. And we're going to be able to suture this to fascia and cut off the edges there. And what we use for our suture here -- too long. So we just kind of cut these edges off because we would rather preserve blood supply to the skin flaps than to lose blood supply, and so we want this to lay flat as much as possible and try not to have any folds, because folds will collect fluid and clot. And so here's our uniform piece. It's going to go over all the areas that we have any concerns. And what Brian has for us is a 2-0 proline, the permanent stitch.

01:06:57

DIMITRI KOUMANIS, MD: Now, we're overlaying here like we talked about, reinforcing our middle. When you're underlaying, Dr. Chao, Jerry, came up with a good little technical point, and that is if you need to actually fold the edges through to take even nicer bites just along the edges of the Veritas, that means you're biting through two layers, that's a good, nifty technique that he came up with, too.

01:7:21

JEROME CHAO, MD: So what I'm doing now is tacking down. I guess what Dr. Koumanis is talking about is sometimes some of these have just -- you know, you have not that much strength on the edge, and if you fold it over and suture through both, then you'll have strength. And that's for when you have a large amount of tension on the underlay. And that's for any of the biologics that you use. Just kind of a pleat there. Do me a favor and hold that. And so the first thing we do is we tack it superiorly. And that'll be our anchoring point so that we can stretch it. This doesn't have as much stretch as the human dermis version, which is also a bonus. And I don't have to worry so much about that. But you'll see, that will go a good distance.

01:08:13

DIMITRI KOUMANIS, MD: Could I have a Rich?

01:08:19

JEROME CHAO, MD: And we'll get good coverage here and we get into the fascia. And suture scissors. Cut both of them. Reach over a little bit.

01:08:49

DIMITRI KOUMANIS, MD: Watch your finger on the needle underneath.

01:08:53

JEROME CHAO, MD: Thank you.

01:08:56

DIMITRI KOUMANIS, MD: Going down here next, yes.

01:08:59

JEROME CHAO, MD: Get that one down there. And you want to get the fascia. Fascia, fascia, fascia is what we want. Then what we will do now is -- this will come to this edge and this -- to this edge. And you'll see that that's what tension we're going to be removing from it. So I'll just put another one here, and we know we have the rectus underneath this location. And peritoneum. So you can take a modest bite of the fascia, the fascia.

"Fascia."

01:10:09

DIMITRI KOUMANIS, MD: All right, side two.

01:10:12

JEROME CHAO, MD: One on that side. Here's the edge. So I'm going to bring it to the edge and we're going to grab and put the Veritas on a little bit of tension. And if you need to, you can trim down your piece of Veritas to get that tension that you want. Okay. So now what we'll do is we'll take new 2-0s, and if we can kind of just sew together, try to do that. So we're going to take two 2-0s and --

01:10:54

DIMITRI KOUMANIS, MD: I'd rather not.

01:10:55

JEROME CHAO, MD: Okay, he doesn't want to, so we'll just run. So at this point I'm tacked, I know where I want to be, so I'm going to just run the suture all the way around the periphery. And this part is a little faster. Now, you can lock these, just run it continuously, but grabbing good stuff, basically. And part of the reason we do this, you can just do it on the sides, but you want to get as much contact as possible. And so it might not -- and we'll just...

01:11:55

DIMITRI KOUMANIS, MD: Excellent. So this is where you can pick up some time and go a little faster, as Dr. Chao is doing.

01:12:11

JEROME CHAO, MD: I think in this case, we probably won't need an ICU, because I think what we'll end up doing is extubating him. Right now one of our --

01:12:21

DIMITRI KOUMANIS, MD: What are our peak pressures, anesthesia?

01:12:25

JEROME CHAO, MD: What is it right now? 30. Okay, is he becoming more relaxed? Unrelaxed, I mean? Okay, good. You going to get him breathing? And so where I am sewing right now is the edge of the rectus, the lateral edge of the rectus. We've moved our two muscle flaps, and what happens is that the external oblique fascia will kind of roll up. And you are going to get a little roll on this edge, obviously, because you're putting these stitches in, but take care to grab some fascia. Grab it first, pull it over if you have to. And that'll get your tension. Every once in a while Brian will irrigate the flap with just regular saline just to -- I mean, the Veritas with regular saline just to keep it moist. And you can see, no tearing of the Veritas, it's very strong. And he'll just go ahead

and irrigate while I'm still working. And then we're almost done with this side. You can see, I've got a little knot, but I'm not worried about that. The Veritas is strong enough to handle that knot pulling through. And at some point you've just got to start another suture. So then we -- we'll have to do the other side to show you the augmentation of the repair. In fact, what I'll do now is go do my midline so that we can show you what we do. One of the problems that we were having with the other products was the formation of seroma underneath this, and so what we've been doing is taking another 2-0 -- and we still have to do that side, but I'm not going to do that right now. We'll take a couple more 2-0 prolines and so I'll just run this quickly, and then I'm going to show you the midline proline that we're going to put in. So our series of Veritas cases, I'm not sure of the number we've done -- a large number. And I guess I should look that up and let you know, but since we've been using the Veritas, our issues with seroma and wound problems after have been diminished. We're quite happy with how this product has been working for us, and part of the reason why we were happy to show this particular technique that we're doing with the Veritas, just a few extra little things that we do with it, it's really the product that's doing the work for us. We basically use it like we would any of the other products, and what we've just done is add a couple more sutures. And I'll show you one of them, and then we can talk about that.

01:18:27

DIMITRI KOUMANIS, MD: Take the needle up.

01:18:37

JEROME CHAO, MD: And so that's our periphery stitch, and then what I want to do now... We probably do a component every week at this institution, and so it's been very important for us to have an implant, so to speak, that does the work that we needed it to do. So now what I do is take another proline, the proline stitch, and here I know that we've built up the tissues, and so yes, I'm still being careful in terms of not catching the bowel beneath, but what this will do for me is two things: one is it's going to cause more adherence of the Veritas to the abdominal wall so that integration hopefully is quicker, and also decrease the ability of any fluid to build up underneath. And then, finally, the repair of our figure-of-eight sutures is augmented from this additional suture. And so I'm feeling my way. There's a good thickness of tissue under there, so the likelihood of catching bowel is very low. But you have to know where you are. And you can see, what I'm doing is grabbing on both sides the tissue underneath with this particular needle. Brian, what needle is this? It's a 2-0 proline on a CT tube, which just through trial and error we've found is just the right curvature for what we need it to do. So you can see those sutures kind of pushing up, and that's what I'm -- that's the fascia that I'm grabbing on either side with this -- with this stitch. The other thing is that we have, as you guys say, a very big omentum underneath this, and that's also a good reason to keep that omentum, because it provides protection from many of these sutures.

01:21:05

DIMITRI KOUMANIS, MD: So when we're done with this, we check for hemostasis again, and then we will talk about drains, which, Dr. Chao, I know you like to use one up the middle, correct?

01:21:16

JEROME CHAO, MD: Yep.

DIMITRI KOUMANIS, MD: And then two alongside, just down, coming in from the

lower aspect of the wound, sitting right on top. And we don't take these out until they're fairly dry instead of waiting the -- we like to look at less than 20 cc's, but for a good two or three days cumulative. And while they have their drains in there, we make sure postoperatively that if they don't have good suction, we keep them on wall suction until they do kind of epithelialize around the drains and we get good suction. That's a key component. And then we keep them on antibiotics until we're happy that we're able to pull each out. And we'll pull each one out sequentially over a 24-hour period. And that has also helped us cut down on our seroma accumulation as well.

01:22:17

JEROME CHAO, MD: Needle up. Okay. And so we'll -- we'll put another row of sutures here, another row of sutures here, and then we use three drains, one for each gutter and then one in the midline. Sometimes if it's a larger space, it's two. So I think we are towards the end of our time. As you can see, we'll end up closing this. We have a little overlap and we may cut off that scar tissue, and then we'll end up closing this with a layered closure with the fascia first and then what I like to do is use horizontal mattresses augmented with staples. So we'll do that in a few minutes. So basically, that's what we do in a nutshell. Sometimes cases take a long time and sometimes they're very fast. This was a little longer because of the actual size of the hernia. We had a lot to sew here, which becomes tedious, but at no point do you cut corners for speed. We'd like to thank Synovis for allowing us to show you our technique that Dr. Koumanis and I use and also for Albany Medical Center for also giving us permission. And at the conclusion or when this does end up airing, we'd be happy to answer any questions that people have in terms of the technique or in terms of our experience doing the component separation procedure with Veritas onlay or any of the other techniques that we use the Veritas for. So thank you very much.

01:24:19

DIMITRI KOUMANIS, MD: Thank you.

JEROME CHAO, MD: Thanks.

01:24:22

ANNOUNCER: This has been a component separation for complex abdominal wall reconstruction performed from Albany Medical Center in Albany, New York. OR-Live makes it easy for you to learn more. Just click on the "Request Information" button on your webcast screen and open the door to informed medical care. This event was sponsored by Synovis Life Technologies.

01:24:53

[end of webcast]