ENDOVASCULAR REPAIR OF DESCENDING THORACIC AORTIC ANEURYSM
UNIVERSITY OF VIRGINIA HEALTH SYSTEM HOSPITAL
CHARLOTTESVILLE, VIRGINIA

00:00:18
ANNOUNCER: Welcome to University of Virginia Health System Hospital in Charlottesville, Virginia. Over the next hour, see a live endovascular repair of a descending thoracic aortic aneurysm, with the Gore Tag thoracic endoprosthesis. Dr. Michael Dake, Professor of Radiology and Chairman of the UVA Department of Radiology is your host for this live webcast. In just moments, you'll see how doctors use the Gore Tag thoracic device, the only approved endoprosthesis in the US that provides a minimally invasive alternative to open surgery.
00:00:49
MICHAEL D. DAKE, MD: This is really something that's been a real benefit for patients, not only in terms of the morbidity that it reduces so that they get back to their normal routine in a faster tempo, but also impacting the mortality. The aneurysm-related mortality with this procedure, with this Gore device in the pivotal FDA trial was less than with open surgery.
00:01:12
ANNOUNCER: 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 go live to the operating room.
00:01:26
MICHAEL D. DAKE, MD: Hello and welcome to this OR-Live broadcast of the repair of a descending thoracic aortic aneurysm with the Gore Tag device. My name is Mike Dake and I'm the Chairman of Radiology at the University of Virginia. For those of you not in the room, but for those who are watching on the broadcast with OR-Live, I'll be moderating this case from New York, from the Veith Symposium, which is a meeting of multi-specialty physicians here in New York. So we will have questions coming both from New York and from you who are watching on OR-Live. I want to invite you to submit your questions directly to the OR, via the OR-Live.com. At this point, I'd like to go over to the physicians at the University of Virginia and have them introduce themselves. Let's see, I think we can all see what – Can you hear me there?
00:02:14
ALAN H. MATSUMOTO, MD: Michael, I can hear you. This is Alan.
00:02:17
MICHAEL D. DAKE, MD: Alan Matsumoto is going to be the moderator from the UVA site. Alan, tell us what you've got for us.
00:02:23
ALAN H. MATSUMOTO, MD: I'd like to welcome you to Charlottesville, Virginia, the University of Virginia. First of all, before we begin the case presentation, I'd like to introduce folks in the operating room that's making this happen. Our anesthesia team includes Lori Conklin, who's the attending anesthesiologist, along with her resident [Kathy Starter]. The nursing OR team includes Karen Love, Connie [Cottrell], the circulator's Antonio Shelton, and our interventional technology team

includes Gator Edwards, Bob [Growden], and [LeAnne Doray]. The operating physicians are Dr. Bulent Arslan, the attending interventional radiologist, along with the interventional fellow, [Saher Sabri], and the attending cardiovascular surgeon is John Kern and his fellows [Al and Reuben]. Dr. Arslan has about five years experience doing endographs, Dr. Kern has been intimately involved and been placing endographs for close to eight years now, so it's a very experienced team. So, what I'd like to do now, after this introduction, is go to the case presentation, if we can go to the PowerPoint slides.
00:03:40
MICHAEL D. DAKE, MD: Thanks Alan, just to let you and those who are on the OR-Live broadcast know that we've got a great crowd here in New York, sort of standing room only and go ahead Alan.
00:03:50
ALAN H. MATSUMOTO, MD: Okay, this is a 74-year-old female, she's Dr. Kern's patient and he was gracious enough to allow us to perform this as a live case. She's status post ascending aortic aneurysm repair and hemi-arch repair with a 32 millimeter Dacron graft in July of 2005, that Dr. Kern had done. Now with an asymptomatic enlarging descending thoracic aortic aneurysm that is saccular. It's maximum diameter is 60 millimeters. Two years ago it was only 53 millimeters and we have enrolled the patient in the Gore Tag 05-02 trial. Here's an axial image showing the aneurysm, the configuration, what it looks like. It's in about the mid-descendant thoracic aorta. Some other pertinent information, co-morbidities include hypertension, hyperlipidemia. She has mild aortic insufficiency with normal LV size and function. She has non-lifestyle limiting left lower extremity claudication. Pertinent laboratory data reveals a GFR 58, hemoglobin and hematocrit of 14 and 43.5 respectively. Platelet count is normal. INR and PTT are also normal. This is a CTA. It's a sagittal reconstruction from a multi-reformatted image. The red lines here show our relative diameters and the proximal landing zone here in the transverse aortic arch. We have four measurements that vary between 29 to 31 to 30 to 29 here. This fifth red line is the aneurysm. You can see the sac of our aneurysm, the proximal descendant thoracic aorta. Our distal landing zone is down here in these lower three lines and they measure 29, 31, and 30. In between there, there's an area that measures about 36 millimeters that the operators have chosen to place the distal landings on the distal of that. The overall length of treatment segment that they plan to treat is roughly 24 centimeters. There is a small area of aneurysmal dilatation on the lower line here that you can see, that measures 37 millimeters. The operators prefer not to get near there and address that small little aneurysm just above the celiac artery. This is a coronal MPR that shows how calcified this patients vessels are and the various measurements, the right common iliac measures ten millimeters, left common iliac measures nine millimeters, the right external iliac measures seven and the left external iliac measures six, and so we'll talk to them about their access. You can see how calcified this is, but you can see over here no the axial image, it looks like on the anterior surface, the right common iliac looks pretty soft, at least anteriorly. So in terms of the case planning, our operating surgeon and interventional radiologist decide to perform the case under general anesthesia. The plan was to put a CSF drain in and a Foley catheter. They plan to do a right common iliac artery access with a ten-millimeter Dacron by directly puncturing the conduit and inserting at 22 French sheath. They're planning left femoral access for calibrated pigtail catheter for the diagnostic angiogram. They're going to place a C-arm at a 55-degree LAO position based upon the CT and place two overlapping 34 by 15 millimeter Gore Tag devices. They're going to build distal to proximal. The plan is to observe the patient in the ICU for 48 hours with the drain in place, maintain the mean arterial pressure above 80, to maximize stent graft – I

mean thoracic aortic and spine profusion. At this time I'd like to go to this little video that basically, in about one minute and 30 seconds will show what these operators are planning to do with the device. If we can go to the video.
00:07:59
MICHAEL D. DAKE, MD: Alan?
00:08:00
ALAN H. MATSUMOTO, MD: Yes.
00:08:01
MICHAEL D. DAKE, MD: Before you do that – Oh, the video's on. We'll ask the questions afterward. Go ahead.
00:08:04
ALAN H. MATSUMOTO, MD: Okay. So this is an example. We're going to try to work in a projection that maximizes the profiles, the aortic arch anatomy. That's a wire going in with the device being advanced coaxial over the wire, the device is deployed. It opens from the mid and expands peripherally from there. The device's delivery catheter is then removed and then you will see the Gore Tri-lobe balloon being inserted with intent to mold the endograph. The Gore device has no self-retaining hooks. It's constructed of nitinol and PTFEs, it's self-expanding. So the balloon is positioned initially distally, here it's shown being positioned distally, being molded, and because it's a tri-lobe balloon, it's inflated once, rotated approximately 60 degrees and inflated a second time. The operators will tell you about the volume that's chosen to use to mold the device, and then it's advanced proximally to create good seal zone proximally and although this cartoon shows the balloon up fairly high, we tend to keep it within the graft, especially if we're around the aortic arch. Here's the device being removed and right now what I'd like to do is turn over to Dr. John Kern, our cardiovascular surgeon and Dr. Bulent Arslan, the interventional radiologist who will be operating.
00:09:34
MICHAEL D. DAKE, MD: Alan, before you do that, could you go back to the last slide? One of the benefits for the audience here and also those following on the webcast is that there's an opportunity here to really ask questions about this plan. Could you back to the slide that gave the case plan, Alan?
00:09:50
ALAN H. MATSUMOTO, MD: Okay.
00:09:51
MICHAEL D. DAKE, MD: I think you should probably take advantage of this because this is -- uniquely on live cases – we don't often have the opportunity to go through and have a full 45 minutes or an hour to do this, so there's a lot of meat here on this case plan, including questions about CSF drainage, lumbar drain, questions about conduit access onto a common iliac, in this case, questions about imaging and how they got a 55 degree angle, questions about placing from distal to proximal, if you're going to use two stent grafts. So there's a lot of meat here that we can discuss and we'll get questions coming in on the computer that I'll sort of volley to all of you here in the room, and if you have questions here, please raise your hand and I'll serve them up to John Kern, and Bulent Arslan, and Alan back in Charlottesville.
00:10:36
ALAN H. MATSUMOTO, MD: Okay.
00:10:36
MICHAEL D. DAKE, MD: Any questions about this plan?
00:10:38
ALAN H. MATSUMOTO, MD: At this point, what I'll do, Mike, is I'll turn it over to Drs. Kern and Arslan and let them address their plan.
00:10:46

MICHAEL D. DAKE, MD: Okay. That sounds great. Welcome John and Bulent. It's great to have you. You've got a big audience here and of course a large audience on the webcast. Do you have any special thoughts or considerations about the challenges of this case?
00:10:59
JOHN A. KERN, MD: Well, that's Mike. It's nice to be here and nice to hear that there's a great audience. The planning features of this, some of the specifics for this patient, have been borne out by Alan. The specifics for the access – I guess I'll start there unless there's – please ask questions – but the specifics for the access, there's some challenges here. Her external iliac and common femoral arteries, although not calcified, are just a touch too small and we felt a little gun-shy utilizing those vessels for our sheath. So we did elect to use the right common iliac artery and we did sew this ten millimeter – Can we see that?
00:11:39
ALAN H. MATSUMOTO, MD: If we can take the camera and maybe zoom in into that conduit there that Dr. Kern has his hands on.
00:11:44
JOHN A. KERN, MD: So this is the ten-millimeter Dacron conduit. It's accessed onto the common iliac artery through a relatively small transplant incision, if you will. If you did have a picture of the CT scan, her iliac vessels – you've got to look at these things carefully. She had just an abundance of plate-like calcium in the usual posterior medial fashion. Fortunately it was not circumferential and there was a nice soft area anterior laterally on that common iliac and it really gave us two options, and one option is if you can really control and take care of and expose that iliac artery like you would the common femoral artery, I at times feel very comfortable just directly accessing that iliac vessel, but it's also very nice if you have the ability, if you feel you can't control it well enough and work through it, then you just sew on a ten-millimeter Dacron graft and that's what we've done. The only other little trick we've done is we didn't bring that Dacron graft out through our incision. We actually brought it out just above the inguinal ligament, so it gives us more of a straight shot heading in.
00:12:47
MICHAEL D. DAKE, MD: Looks like you've got a nice counter-incision to sort of decrease the acuteness of the approach to the iliac and that's a 22 French sheath, John, or no?
00:12:56
JOHN A. KERN, MD: Yes.
00:12:56
MICHAEL D. DAKE, MD: What size sheath? 22?
00:12:57
JOHN A. KERN, MD: Yes, 22 French because we're putting in a 34 device.
00:13:01
MICHAEL D. DAKE, MD: Now, any questions? Please don't be shy. This is the… We've got John, who's very experienced. Is there any questions about access?
00:13:10
ALAN H. MATSUMOTO, MD: John, maybe you could explain why you prefer to directly puncture the endograph, I mean the conduit, rather than inserting it from the end of the conduit?
00:13:20
JOHN A. KERN, MD: Well that's a great question. The inherent thing would be, or you think you might just want to work through the end of this graft. This is a ten-millimeter graft and if you do that, no amount of Romel tourniquets or vessel loops is going to control the bleeding. So you see what we've done here. We've clamped the

end of our graft so this is just a new access vessel right here. So we just work through, we puncture directly. Sometimes enlarge the puncture site with an eleven blade, but here you see the nice hemostasis afforded by the sheath going directly. We haven't inserted the sheath the whole way. We thought we would do that for you. This is the dilator of the sheath into the Dacron. I have it in there for some hemostasis, obviously, but we'll get that in live.
00:13:59
ALAN H. MATSUMOTO, MD: And why did you choose to plan to put a CSF drain in and where are we with that?
00:14:04
JOHN A. KERN, MD: That's a very good question on this case, Alan. We are very liberal with CSF drains in general. We know from the surgical literature that there are benefits from CSF drainage, particularly when you're repairing thoracoabdominal aneurysms. Our experience and everyone else's experience from the Gore trials are the incidence of paraplegia is not zero with endografting. We can decrease the incidence of paraplegia with the use of CSF drain, particularly when you're going to cover a rather large amount of the aorta, the descending aorta, or you're going to cover certainly the lower half and third of the descending aorta, and particularly in patients with extensive peripheral vascular disease and in those who have previous infrarenal abdominal aortic aneurysm repairs. So, she has not had a previous procedure on her infrarenal aorta. She does have vascular disease. We're not going to cover the most critical aspect of her thoracic aorta, but we still were leaning towards the lumbar drain. Now, for means of full disclosure, less than one percent of the time, we're unable to get a lumbar drain in and our neurosurgeons actually worked for and hour and a half this morning to get a lumbar drain and were not able to. At that point, it becomes a risk-benefit ratio. I think given the fact we're not covering all the way down to the celiac, I think we'll be okay without it. We're going to keep her profusion pressure good and I think we'll be okay.
00:15:28
MICHAEL D. DAKE, MD: I think it's fair to say also to mention that putting lumbar drains in are not necessarily innocuous. Many things can happen, especially with anticoagulation such as hematomas, but I can't remember the last time we have had a complication, so at least we've been fortunate that this has been relatively complication-free at UVA. Now, any questions from the audience? I'm challenging you. This is a great chance. There we go, we've got a question here. One second, go ahead.
00:15:54
AUDIENCE MEMBER #1: The plan for heparinization is what?
00:15:57
MICHAEL D. DAKE, MD: Okay. So what is going to be the anticoagulation protocol, or what do you typically use and what's being used here?
00:16:04
JOHN A. KERN, MD: Great question. Our heparinization protocol is 200 milligrams per unit, between 100 to 200 units per kilogram, and we generally heparinize right when we're getting ready, right after we've established access, or in this case, right before we clamp the iliac vessels to sew the conduit on. So at that time we had not yet had contralateral groin access but we heparinized just as we were getting ready to clamp to sew the conduit on with anywhere between 100 to 200 units per kilogram.
00:16:35
MICHAEL D. DAKE, MD: Any questions about CSF drains, lumbar catheter protocol, either post-op? Anything? Anybody have any questions about that? Yes. We've got another question. Hang on guys. Again, this is the benefit of something like this,

because usually we're restricted to like a ten minute window and we don't have opportunity to have this dialog. Go ahead.
00:16:54
AUDIENCE MEMBER #2: How long do you keep the spinal drain in place. That's question number one.
00:17:00
MICHAEL D. DAKE, MD: Question one for either – John, why don't you answer it? Yeah, okay, go ahead.
00:17:05
JOHN A. KERN, MD: Our general protocol is 48 hours, particularly in those patients who we've deemed to be very high-risk, previous infrarenal aortic procedure or coverage, if you will, coverage of the lower thoracic aorta. Patients like here, if we were successful in getting a lumbar drain in, probably only 24 hours.
00:17:27
AUDIENCE MEMBER #2: And question number two is are you using ACT measurements?
00:17:31
JOHN A. KERN, MD: Yes, we check an ACT three to four minutes after the heparin. Our ACT here was 394 and if the procedure rolls on for an hour or an hour and a half, we'll check it again and we'll try to keep it generally in the 300s.
00:17:46
AUDIENCE MEMBER #2: Thank you very much.
00:17:47
MICHAEL D. DAKE, MD: Other questions before we go ahead? Yes. Question over here. You guys have primed the questions. This is good.
00:17:54
JOHN A. KERN, MD: That's what we want.
00:17:56
AUDIENCE MEMBER #3: Could you explain to me why you decrease the blood pressure to about 80 millimeters mercury in the ICU? It's well-known that low blood pressure could lead to neurologic deficits, for instance.
00:18:10
JOHN A. KERN, MD: I will accept the responsibility for that question. So, what I'm going to be doing is just explain to you that that slide was to say we keep the blood pressure above 80 millimeters of mercury. So for whatever reason, the mean arterial pressure drops, we will give some phenylephrine or neo-synephrine to keep their blood pressure up. So the intent of that slide was to say we keep their mean arterial pressure a minimum of 80 and preferably closer to 90.
00:18:44
MICHAEL D. DAKE, MD: I think especially in many cases of dissection it's counterintuitive for the ICU staff to think about keeping a blood pressure up after dissection so many cases, signs above the bed and neon colors, etc., saying if the mean arterial pressure drops below whatever, this is a surgical emergency because people aren't really used to thinking in that particular context. Other questions?
00:19:04
ALAN H. MATSUMOTO, MD: So, maybe while you're looking for the questions, we can go ahead and go live and start working on the case?
00:19:10
MICHAEL D. DAKE, MD: Yeah, why don't you go ahead and get a tight shot on that sheath as they introduce it and we'll watch fluoro, as well?
00:19:16

ALAN H. MATSUMOTO, MD: So, if we can come, the camera, in on the sheath as they advance in so they can see John's hands working. Maybe he can talk about the tactile sense and what he's feeling and thinking about.
00:19:27
JOHN A. KERN, MD: Yeah, again it's snug going in. There's a couple of shoulders on the dilator and those when in pretty easy. We already have – Before we went live, we obviously got access, stiff wire access, up and around the arch. But right now we're right here at the area as you see. Let's see. Just pull a little counter tension and this is the area where we just got to give it a boom. It pops right in and we're going to go ahead and slowly advance this over our wire.
00:19:53
BULENT ARSLAN, MD: Can we show the fluoro at this time?
00:19:55
JOHN A. KERN, MD: As you see there we see it going up.
00:19:58
ALAN H. MATSUMOTO, MD: So let's go to the live fluoro image if we can.
00:20:01
JOHN A. KERN, MD: It goes in…
00:20:02
MICHAEL D. DAKE, MD: Ten-millimeter graft is your default common answer to all of these sheaths.
00:20:05
JOHN A. KERN, MD: Ten-millimeter graft. It just goes in very easily.
00:20:08
ALAN H. MATSUMOTO, MD: So there's the live fluoro image being shown. John, when you're advancing…
00:20:14
MICHAEL D. DAKE, MD: What wire do you…?
00:20:15
BULENT ARSLAN, MD: Yes, very good. We have a Lunderquist wire with a pre-curved tip which sits on the aortic arch and it doesn't have the problem of refluxing because of the pre-shaped format of it. We have been recently preferring this wire almost all of the aortic cases and it has enough stiffness to it so…
00:20:38
ALAN H. MATSUMOTO, MD: How far up do you like to take the sheath, Bulent and John?
00:20:43
BULENT ARSLAN, MD: Obviously we have to be below the level of the device and it's about a 40 centimeter sheath and it reaches just below the level of the celiac and we actually have that on the graft right now.
00:20:59
JOHN A. KERN, MD: That's a very practical question because once you have this graft in, you don't want to puncture too far out here on the graft because then you're going to be potentially working short. Now of course you can accordion the graft on it but that just gets a little bit more difficult, so I like to straighten this out and then essentially puncture where you would if you were working through the common femoral artery.
00:21:18
ALAN H. MATSUMOTO, MD: John, when you have a conduit, do you have any concerns about the transition from the conduit to the native, common iliac artery, advancing this device through that?
00:21:27

JOHN A. KERN, MD: That's a very good question and we remove, for the purpose of the [unclear], we removed the retractors, but I still have easy access right down through here to where that graft is sewn on and you do have to sometimes get down there and just hold that area with your fingers. If your initial wire's not going up, it's getting caught on the edge, or you're even anastomosis, you just feel it and you feel it go through your fingers. Same thing with this dilator and sheath, but that went up real easy.
00:21:50
MICHAEL D. DAKE, MD: Great. Well, why don't you guys move ahead so we don't run the risk of dallying too long.
00:21:56
JOHN A. KERN, MD: So we're going to take this dilator out, then maintain wire access.
00:22:00
BULENT ARSLAN, MD: Actually if we can hold it just for a second, do our angiogram first, and then get our position and then switch to the graft so we don't lose blood.
00:22:09
MICHAEL D. DAKE, MD: The 55-degree LAO, is that where we are now?
00:22:13
BULENT ARSLAN, MD: Can we go?
00:22:14
ALAN H. MATSUMOTO, MD: Bulent, do you want to go show the devices first?
00:22:17
BULENT ARSLAN, MD: Yes.
00:22:17
ALAN H. MATSUMOTO, MD: Bulent, do you want us to show the devices here or over on the…?
00:22:22
BULENT ARSLAN, MD: Over there. Yeah. Why don't Dr. Matsumoto show the devices over there?
00:22:26
ALAN H. MATSUMOTO, MD: Okay. So, we're going to take the camera and show the devices outside the body so folks can see what's happening in vivo. So if we can move the camera over the devices. The sheath that's in place, you have seen. This is the transition point. Here's the sheath and over here we're going to zoom up on this area. This is the area where Dr. Kern put the tubing clamp on, right here, as you remove the dilator. Each one of these sheaths come with its own specific cap. This one's designed for the dilator. There's one for guide wire. There's one for the introduction of the device. There's a side port that you hook up a three-way stopcock and a flush through there. And once you get the sheath in place, you then remove the dilator and it's important when you're advancing the sheath that if you see this little black line here that is centered within this clear area so that the transitioning area of the sheath is optimized here as you're advancing it in. So this is the sheath that's in place. Now let's take a peak at the device ex vivo. Now this is a non-sterile device and you can see the endograph here and when Dr. Arslan and Kern open the package, they check it for its integrity and its junctions and it has a red line on it because it's a non-sterile device. The back end of the device looks like this and so there is a port for flushing the end of the catheter. There's a [Tuey] on the back to tighten around the wire and there's a ripcord that when you pull that, the device opens. Now what we're going to do is go ahead and deploy this ex vivo and note that this thing opens from the medial middle and opens to either end like this and that's what you're going to be seeing in vivo. So we're going to watch this and deploy it now. So it's one steady pull and you can see it deploy. Now because it is nitinol and

it's a thermal memory, it requires a little warmth, so in the body, this will rapidly expand from the middle out. If I put this in warm water, you'd see this go to its nominal size here and you can see the nitinol backbone and the PTFE graft. You can see the scalloped ends and there's no barbs or hooks on this device. Okay, we can go back to Doctors Kern and Arslan.
00:24:51
BULENT ARSLAN, MD: Actually, let's at this time do our…
00:24:53
MICHAEL D. DAKE, MD: That was a nice demonstration.
00:24:53
BULENT ARSLAN, MD: diagnostic angiogram. So we're going to hold the respirations and take our first picture.
00:25:12
MICHAEL D. DAKE, MD: Well, unfortunately there's something right over our screen, guys. I don't know if you're seeing that. Looks like…
00:25:21
BULENT ARSLAN, MD: If we can get rid of that…
00:25:23
MICHAEL D. DAKE, MD: Little litmus paper there.
00:25:24
BULENT ARSLAN, MD: Yeah, I was checking the pH of the environment.
00:25:27
MICHAEL D. DAKE, MD: pH of the environment.
00:25:31
BULENT ARSLAN, MD: So, maybe while they're bringing that up, see if we can bring up a repeat of that last digital subtraction angiogram if we can. Show it to the audience. Folks.
00:25:44
MICHAEL D. DAKE, MD: So your proximal drop zone on this 55-degree LAO, Bulent or John, where do you want that? Where are you going to target your proximal margin of the stent graft?
00:25:55
BULENT ARSLAN, MD: We're going to actually deploy the proximal part right at the level of the subclavian origin.
00:26:00
ALAN H. MATSUMOTO, MD: If we can go to the angiographic monitor so the audience can see that last digital run, please. If we can replay it? Yes, there we go. If we can step through that run, Bob?
00:26:13
MICHAEL D. DAKE, MD: A little tighter on that camera.
00:26:17
ALAN H. MATSUMOTO, MD: If you can get tighter and, Bob, window a little bit less contrast if you can.
00:26:26
MICHAEL D. DAKE, MD: It looks like just distal to the subclavian, there's a little hump on the greater curve there, so you're going to try to get past that, I guess.
00:26:34
ALAN H. MATSUMOTO, MD: Go forward a couple of images, Bob. Keep going.
00:26:36
JOHN A. KERN, MD: We're just going to go obviously proximal to that and just – essentially the tips of the crowns, just distal to the subclavian.
00:26:43
ALAN H. MATSUMOTO, MD: Great.

00:26:44
MICHAEL D. DAKE, MD: Obviously there's a lot of mural thrombus within the sac, so we see some lumpy bumpy on the posterior aspect here, but we're going to cover down to just about just below those last couple bumps, I guess. Okay. Great.
00:27:03
JOHN A. KERN, MD: We know from the CT, see the whole saccular aneurysm is full of thrombus, so it's obviously not going to enhance on that arteriogram, but you can see it on the fluoro shot. You can see the density of the aneurysm.
00:27:14
BULENT ARSLAN, MD: Actually, on the angiogram, the aneurysm starts right after the angulation of the ligament of Treitz and then it ends.
00:27:23
MICHAEL D. DAKE, MD: We can see a little fusiform dilatation.
00:27:25
BULENT ARSLAN, MD: Yes. That's the aneurysmal part, and then there's that other slightly dilated portion right below that ridge on our presentation. It measures about 36 millimeters in that zone. So one would choose that area which is more than two centimeters but it also is a landing zone, too. That was an option as well. It's just that you would have to upsize your graft size to 40 and then you would have to deploy your proximal graft first and then put the 40 inside that. We discussed that and we actually prefer to use the same size graft, which is just another three centimeters lower segment and that way we would deploy the distal graft first, which would help us to be hopefully by experience more accurate on the deployment of the proximal component at the level of the subclavian.
00:28:16
MICHAEL D. DAKE, MD: Okay, great. Questions from the audience. Why don't you continue working and we've got a question.
00:28:22
ALAN H. MATSUMOTO, MD: So, we're going to, while they're working they're going to just come in on their hands, show what they're doing.
00:28:28
MICHAEL D. DAKE, MD: Alan, hang on. We've got a question. Go ahead.
00:28:30
AUDIENCE MEMBER #4: If you plan to deploy the distal graft first, why do you make that huge angiogram with that kind of volume from the valve and down? Because if you pull back a pigtail catheter to the distal [unclear] you could get off with just 10, 15 cc of contrast to visualize the distal landing zone first.
00:28:52
MICHAEL D. DAKE, MD: Okay, I don't know if you heard that question.
00:28:55
ALAN H. MATSUMOTO, MD: We could hear it.
00:28:57
BULENT ARSLAN, MD: We did the angiogram because the patient's kidney function is perfectly normal. She had far over 60, I believe. Now we had no, other than the CT, which was about three weeks ago I believe, we had no diagnostic studies so we elected just to see how things are, not to have any surprises during the procedure. We used 40 cc of contrast, which is not full strength for that angiogram.
00:29:31
JOHN A. KERN, MD: So now we're just exchanging for the device cath now.
00:29:34
ALAN H. MATSUMOTO, MD: Okay, good. The camera is showing us the change in the device cap specific for the endograph and you'll notice they're not touching the graft material with their gloves. They have a gauze between there. To amplify Dr. Arslan's

point that contrast is half-strength and we felt that you guys would be able to see because her kidney function is normal, the anatomy better if we did a little bigger injection. So really that was…
00:29:57
MICHAEL D. DAKE, MD: And we don't routinely use arteriography as a planning…
00:30:02
JOHN A. KERN, MD: So there's the device going in and hopefully everyone saw that.
00:30:08
MICHAEL D. DAKE, MD: Yes, we've got a good picture of it.
00:30:09
ALAN H. MATSUMOTO, MD: Well, let's watch, go to the live fluoro now, so that we can watch it go up. And you can see the contour of this guide wire and the fellow that's controlling the guide wire is making sure that it doesn't come back or that it doesn't go down through the valve.
00:30:26
BULENT ARSLAN, MD: Distal first. Sit right there. Actually, not right there. Actually, you're a little over.
00:30:34
ALAN H. MATSUMOTO, MD: So, one thing that the audience doesn't have the advantage is is that the operators have a reference image screen that, because of live broadcast, we cannot show both of them at the same time, which they use for relative deployment.
00:30:48
BULENT ARSLAN, MD: Can you show us the angiogram one more time, Bob? The BSA angiogram. Plus this angiogram includes both proximal and distal landing zones.
00:31:00
JOHN A. KERN, MD: Right. We're getting a lot of information from this. We can get everything at once. We're not going to be moving the fluoro at all, but that's a very good question. You can do these with very, very minimal contrast.
00:31:10
BULENT ARSLAN, MD: Stop right there.
00:31:11
MICHAEL D. DAKE, MD: Yes, other questions.
00:31:13
AUDIENCE MEMBER #5: Can I ask you what is the minimum length of normal caliber aorta you would accept above the beginning of the aneurysm to seal below the subclavian and when would you choose to deliberately occlude the subclavian artery origin?
00:31:25
MICHAEL D. DAKE, MD: That's a good question. Did you hear that? He's talking about adequacy of proximal neck before you would feel obliged to go across the subclavian.
00:31:36
JOHN A. KERN, MD: We really like two centimeters. Once we get to 15 millimeters, if we can get additional by covering the subclavian, we'll go with that.
00:31:45
MICHAEL D. DAKE, MD: Again, your walls, whether their parallel, tapered, reverse tapered, can factor into that when you get a little less than two centimeters. Other questions? Okay. I think we're ready, guys.
00:31:59
ALAN H. MATSUMOTO, MD: So we need to go to live fluoro while they deploy this and you saw the deployment, the deploying basically of the little button that attaches

to the ripcord. So, we're going to focus on the fluoro here while they're ex vivo, pulling the little ripcord once they decide they're happy with the positioning.
00:32:21
MICHAEL D. DAKE, MD: So, we're taking the pigtail down?
00:32:23
BULENT ARSLAN, MD: Yup.
00:32:26
JOHN A. KERN, MD: We're completely out of the sheath here, right?
00:32:28
BULENT ARSLAN, MD: Yup.
00:32:33
ALAN H. MATSUMOTO, MD: So is the pigtail going to be withdrawn or are you going to leave it in place?
00:32:37
JOHN A. KERN, MD: Good question. We were just discussing this. We'll just pull it down and get it below and then run it back up after we deploy this distal device.
00:32:45
ALAN H. MATSUMOTO, MD: You might have noticed they straightened out the pigtail with the guide wire so that it wouldn't hook on anything. It tends to be a little less traumatic than breaking off some plaque or something.
00:32:57
JOHN A. KERN, MD: You want to take the wire down?
00:32:58
BULENT ARSLAN, MD: Yeah.
00:32:59
JOHN A. KERN, MD: I'm happy with this position. Are you good? All right. So we're good. You'll notice we're not doing anything special. If the blood pressure were sky high we might be aware of it, but we're not doing anything special. Right now, our blood pressure for those of you who are interested is 114 over 45, means are in the high 60s. All right. So everything's in place. Go ahead. So here we're going to deploy our first device.
00:33:27
BULENT ARSLAN, MD: We're showing the fluoro, right, live?
00:33:29
ALAN H. MATSUMOTO, MD: Yes, the live fluoro is showing. There.
00:33:32
JOHN A. KERN, MD: That opened up nicely and right where we wanted it.
00:33:37
BULENT ARSLAN, MD: Take a single picture of that.
00:33:39
ALAN H. MATSUMOTO, MD: So you can see it's opening and now they're going to remove the delivery catheter. While they're removing the delivery catheter and putting in the balloon to pack down the distal end, I think we'll go down to show what the balloon looks like ex vivo and how that works here. So, if we can switch over to this camera over here, where [Kurt] is, that's live, and we'll show the device. Here's the device. Here's what the balloon catheter looks like. This is the leading end. It's a tri-fold balloon. The back end looks like this and what we're going to do is have [Chris Kaplinger], our Gore rep here, go ahead an inflate the balloon. You'll see why it's called tri-lobed. There's one lobe go up, a second lobe, and then the third lobe. That's what it looks like and that's inflate and then you deflate and then you rotate 60 degrees and that's to help iron out the graft and get it inflated a second time. There is a formula. The diameter of the graft minus 19 is the rough volume you

use to inflate and get the graft to open, and that's what you'll be seeing in vivo. That's the ex vivo. I'll turn it back over to Doctors Kern and Arslan now, live.
00:34:57
MICHAEL D. DAKE, MD: Even though there's a prescribed volume, you're basically using visual confirmation as the balloon goes up to make sure that you're getting wall contact and sometimes the volumes may need a little more. Very rarely do you need a little less. There's some subtleties about what they're doing here about putting the balloon in now. If you go proximal to distal, you really don't have to balloon first, but when you go distal to proximal, there's always that chance, especially if it's a fairly short distal neck. There might be interference taking the next graft through it. So it's a good rule of thumb to always dilate that distal, or balloon that distal neck as they're going to do here so that you've really done everything to ensure that it's actually seated there, so you don't inadvertently dislodge it. Now, you might say, "Why not go proximal to distal?" You've heard one of the reasons, but we'll let them describe to you why in this case they've chosen to go proximal to distal as opposed – excuse me, distal to proximal. Go ahead, John. What was your thinking?
00:35:55
BULENT ARSLAN, MD: John is dealing with that right now. One reason was not to use a larger graft because at the same location we want a distal graft to be funneling into the other graft. So not to have that transition for the blood to kind of come in between the grafts on the direction of the flow.
00:36:17
ALAN H. MATSUMOTO, MD: If we can go to live fluoro as we show the balloon being advanced up, that would be great.
00:36:23
BULENT ARSLAN, MD: Right there.
00:36:27
MICHAEL D. DAKE, MD: Where are you centering that balloon or where are you ballooning at?
00:36:30
JOHN A. KERN, MD: We're going to stay completely within the graft here. It's a little hard to see but the distal band, I believe. Our distal balloon marker is right at the distal band.
00:36:40
MICHAEL D. DAKE, MD: We can actually see it pretty well, John.
00:36:42
JOHN A. KERN, MD: Good, are you okay with that?
00:36:44
MICHAEL D. DAKE, MD: Yup. That's great.
00:36:48
ALAN H. MATSUMOTO, MD: We'll stay on live fluoro while they inflate the balloon.
00:36:51
BULENT ARSLAN, MD: We're going to inject about 15 cc of Valium into this area.
00:36:59
JOHN A. KERN, MD: And even though this is a tri-lobed balloon that allows flow through it, as we balloon more proximally, particularly our more proximal device when we've put it in. Now we're going to rotate it.
00:37:09
BULENT ARSLAN, MD: Come down a little bit. We're still on the graft. Okay, right there is perfect.
00:37:15

JOHN A. KERN, MD: You sometimes have to just provide a little forward tension on it just to keep it from pushing back.
00:37:21
MICHAEL D. DAKE, MD: Is the blood pressure changing, Alan, at all?
00:37:24
JOHN A. KERN, MD: Not changed at all right there.
00:37:27
BULENT ARSLAN, MD: Okay. One more time. Same location.
00:37:31
MICHAEL D. DAKE, MD: As Dr. Arslan was saying, you can put two devices, one inside another, there's always going to be a seam. Where the seam is pointing up, that would mean that proximal would go first and then the distal, so the seam between the two would be antegrade. When you do it this way, the seam is retrograde. Now whether that makes a difference, who knows? And obviously you've got another variable in how much you choose to trombone it. So if you overlap by ten centimeters, that seem probably is not a great justification. The other reason to go distal to proximal is especially if you've got a very large aneurysm without the mural thrombus, but a big aneurysm, fusiform or saccular up there, it sometimes a little easier to get that proximal targeting on an absolute split hair if you place distal first as opposed to deploying it where there's the mid portion of the graft or distal would be within a big saccular dilatation.
00:38:33
JOHN A. KERN, MD: So Mike, we're just ironing this out and providing us a nice avenue to get our next device in. This looks pretty good.
00:38:41
MICHAEL D. DAKE, MD: Let me give you a time. How much time do we have left? 20 minutes. Questions. Any questions from the audience? So now they've put in the distal device. Because the overall length is 24 centimeters, obviously one device would not be sufficient, since the longest device is 20. So they're obligated to two devices and we've talked about the sequencing of distal to proximal and some of the reasons for that and they've now, because distal went in first, they ballooned and sat in the distal neck, and now they're taking out the balloon. What's your next step, guys? Are you going to put the pigtail back up?
00:39:23
BULENT ARSLAN, MD: Yup.
00:39:25
ALAN H. MATSUMOTO, MD: So, why don't you tell us what you're thinking, what you've got planned, guys?
00:39:32
BULENT ARSLAN, MD: We're going to get the pigtail up to the arch again. Hold the sheath please.
00:39:42
ALAN H. MATSUMOTO, MD: So as they get the pigtail back up to the arch to get repositioned, they'll probably put in the new device through the sheath again and what we'll be interesting to note is that with each exchange they're losing very little blood through that sheath.
00:39:56
JOHN A. KERN, MD: Right. You see it right here.
00:39:59
ALAN H. MATSUMOTO, MD: If we can take the camera to Dr. Kern's hands.
00:40:02
JOHN A. KERN, MD: We've actually had – This is the same [lap] that's been underneath it.

00:40:04
ALAN H. MATSUMOTO, MD: Can we put the camera on Dr. Kern's hands, please? There you go.
00:40:11
JOHN A. KERN, MD: You've just got to be thoughtful as you exchange and you've just got to be ready to clamp. You need more than two hands.
00:40:17
MICHAEL D. DAKE, MD: Also the heparinized saline or the saline pressurized bags going in that three-way stopcock can mitigate against the bleed, full hematocrit level up.
00:40:30
BULENT ARSLAN, MD: Pull this out with the wire. Pull it out.
00:40:32
JOHN A. KERN, MD: So we're going to get our pigtail up. We're going to get our next device up. We're very happy with the anatomy of this patient's arch. It's a long length of transverse arch. It's nice and horizontal. So…
00:40:53
ALAN H. MATSUMOTO, MD: So, while they're in the process of getting the pigtail through the first device again, are there any questions from the audience?
00:41:02
MICHAEL D. DAKE, MD: I think it's now again as they get the pigtail up in position and the second device can go in and they can do their run with the second device in place to minimize the gap between when the arteriogram is performed and when they can deploy that second device. Obviously you're accuracy in targeting the second device in the perfect location, or the desired location, is probably in some way directly related to how long after you do this arteriogram you in fact deploy the device. So if you're working in a situation where you don't have perhaps a fixed stand unit and are working in a mobile c-arm, it's always a good idea to narrow that segment of time between the actual arteriographic imaging and when you're going to deploy the device to give you the best chance of being the most accurate.
00:41:51
BULENT ARSLAN, MD: Let's get the device up there. Here's our next device. Flushed. You got it? Hold the end of the clamp.
00:42:05
MICHAEL D. DAKE, MD: What's the length on this one? I know it's the same diameters. Is it the same length?
00:42:08
JOHN A. KERN, MD: 15. Same length. That should give us some nice overlap, given the total length of aorta we want to treat.
00:42:16
ALAN H. MATSUMOTO, MD: So, let's really focus in with the camera at that insertion and watch as they start to insert and clamp. You'll see there's really almost effectively no blood lost.
00:42:25
JOHN A. KERN, MD: Essentially bloodless. Yup.
00:42:28
ALAN H. MATSUMOTO, MD: It's really pretty much bloodless. Now if we can go ahead and go to the fluoro image and let's watch this advance.
00:42:36
BULENT ARSLAN, MD: Advance the wire a little bit. Good. Right there.
00:42:40
ALAN H. MATSUMOTO, MD: I don't know if…
00:42:41

MICHAEL D. DAKE, MD: When you deploy the second device, guys, do you ever use the apnea when you deploy or is that something you're not often that conscious of, the actual respiratory maneuver at the time.
00:42:55
JOHN A. KERN, MD: Yeah, I think some people can have dramatic respiratory variations and we at times, it's a case specific thing, but sometimes apnea can be very helpful and you feel better about your landing it right where you want it to be.
00:43:07
BULENT ARSLAN, MD: We like to get the device past the point of where we want to deploy it and then pull back to get rid of any tension from the device to prevent any potential jumping.
00:43:20
ALAN H. MATSUMOTO, MD: Why don't we center a little higher, magnify up one and you guys can show them the – hopefully we can show the gold band on the graft material there.
00:43:32
JOHN A. KERN, MD: We'll show a couple of things. We'll show there's an excellent amount of overlap.
00:43:36
MICHAEL D. DAKE, MD: It looks like about five centimeters, at least.
00:43:39
JOHN A. KERN, MD: Yeah. There's at least that, and as you already pointed out, Mike, we build from distal proximal so we have that transition zone. You know, the direction of flow? Getting back to the respiratory variation. You see this woman really is not having much respiratory variation at all in her anatomy so were fine to just press on.
00:44:02
MICHAEL D. DAKE, MD: Other questions before they do they're final imaging?
00:44:11
BULENT ARSLAN, MD: Okay. We'll just change our frame rate for this one to get a better picture of it, less amount of contrast. Okay.
00:44:21
ALAN H. MATSUMOTO, MD: Is the pigtail hooked up?
00:44:24
JOHN A. KERN, MD: We're all hooked up.
00:44:25
ALAN H. MATSUMOTO, MD: Okay, great. Okay.
00:44:29
BULENT ARSLAN, MD: Okay, we're going to be shooting the angiogram in just a second. Ready? Can we hold respirations, please? Okay. Yup. Can you center a little better? We're going to probably have to repeat one more time.
00:44:57
MICHAEL D. DAKE, MD: You've got that pretty close. Obviously, remember the arch is not just in a straight one angle. It's sort of more of a banana sometimes, so the more proximal you're going to make that drop zone, the less severe you want your angulation, or the more shallow. In 55-degrees, what their obviously trying to do is make as long as possible. Elongate that distance from the subclavian to the little steeple, peak, or the little kind of gothic peak up at the top of the greater curve, so they can really take advantage of getting it close to the subclavian as they can, but certainly not running the risk of partially occluding it. Questions?
00:45:38
JOHN A. KERN, MD: So, Mike, how are you all doing there? We're pretty pleased with what we have here.

00:45:43
MICHAEL D. DAKE, MD: Yeah, well you approximated that quite accurately.
00:45:48
ALAN H. MATSUMOTO, MD: So, why don't we go to the fluoro image and we'll watch them decide where they're going to deploy. It looks like they're going to go right there. We'll stay on the live fluoro image. Does everybody agree we're going to go ahead and deploy?
00:46:05
MICHAEL D. DAKE, MD: We are waiting.
00:46:06
JOHN A. KERN, MD: Yup. Great.
00:46:12
MICHAEL D. DAKE, MD: That was very – That went exactly where you want. That went where you targeted it.
It didn't move. So now you can see a little expanding there. Well, you clearly got rid of the little – You're over your little divot on the top end, for sure.
00:46:31
JOHN A. KERN, MD: Yeah, I think so.
00:46:32
MICHAEL D. DAKE, MD: Good. It's a very nice magnification for us here. We can see that deployment quite clearly. Questions? Okay. So what's next?
00:46:52
ALAN H. MATSUMOTO, MD: So they're in the process of changing out for ballooning the overlap zone and then they'll balloon the proximal zone.
00:47:03
MICHAEL D. DAKE, MD: Just out of curiosity, what's your preference, Alan? Do you like in this situation, balloon the overlap first? Balloon the proximal first? Doesn't matter? Do you have a theory or a M.O. for this?
00:47:17
ALAN H. MATSUMOTO, MD: For myself, I prefer to balloon the distal overlap zone first so it's well sealed and then we'll go balloon the proximal portion good.
00:47:25
MICHAEL D. DAKE, MD: I agree with you. I think it's again the same theory. If you're going to be going around that curve and there may be some interference or friction, you might as well secure that first of the grafts and make sure it's fully opposed into that first graft so that you don't run the risk of pushing the whole thing forward as you go around to try and get to the proximal margin first.
00:47:47
JOHN A. KERN, MD: Yeah, we're going to go right there.
00:47:50
ALAN H. MATSUMOTO, MD: So you can see they're setting it on the overlap zone. What's the mean arterial pressure doing right now, Dr. Conklin?
00:47:59
JOHN A. KERN, MD: It's in the mid-60s. It's always nice to let your anesthesiologist know you are inflating the balloon, so if the pressure does jump up, they know it's very transient and you see we just ironed that little area. That's nice. We'll bring it down a little, huh?
00:48:17
MICHAEL D. DAKE, MD: We've got about eight minutes left guys. So, if we can get to rhythm for that.
00:48:22
JOHN A. KERN, MD: We'll be good. We're going to balloon this distal ballooner proximal and we'll finish it up and let you see what we've got.

00:48:28
MICHAEL D. DAKE, MD: Great. Questions while they're working? Obviously, they're going to continue balloon that overlap zone to make sure that they've got good circumferential contact between the balloon and the full 360 degrees of the two grafts and then go up to the top and then we'll hopefully get a final aortogram. Questions for anyone? John, as anticipative of the end, what are you going to do with that conduit.
00:48:55
JOHN A. KERN, MD: The nice thing about a conduit, you can do whatever you want with it. If you have the rare patient with occlusive disease in their external iliac, you can use it as a bypass conduit. This, what we do with these when we don't need to utilized it is we're literally going to oversew it right flush essentially with the anastomosis. Leave as little foreign body in their as possible and no iatrogenic aneurysmal area.
00:49:23
ALAN H. MATSUMOTO, MD: We'll go to fluoro image live, please.
00:49:25
JOHN A. KERN, MD: So here we are. We just had a problem with our syringe, so we got a new syringe here. So now we're ballooned and distal. Let's rotate it, fellas.
00:49:36
MICHAEL D. DAKE, MD: Other questions from the audience? Alan, so when this patient – since we didn't get that lumbar drain in, is there anything you're going to do that would tend to think might mitigate against any chance of spinal ischemia? You mentioned the pressure.
00:49:58
ALAN H. MATSUMOTO, MD: They're going to keep the mean pressure above the 80s. They're going to obviously follow her very closely. The neurosurgeon was able to drain about 20 cc of CSF fluid, but based upon the average production rates, 20 cc will probably be reproduced in about four to six hours. The CSF pressure is down while they're placing the stent graft.
00:50:21
JOHN A. KERN, MD: That is a good question. Now that we're at the point we're at, we're actually already letting the pressure or helping the pressure head on up to a mean in the 80s.
00:50:35
MICHAEL D. DAKE, MD: Five minutes guys. Five minutes. So, balloon that top end and get that fully expanded and go for the final arteriogram.
00:50:43
JOHN A. KERN, MD: Absolutely.
00:50:45
MICHAEL D. DAKE, MD: It's important here in the arch when your ballooning, now in this case they're beyond the subclavian, but if this was over the subclavian and the next vessel was the carotid, you would really want to keep that balloon away from the carotid and not run any risks of potentially causing any emboli or anything. You'd keep it so it does get that gold band, but you don't want any balloon prolapsing out over one of the other branches that supplies the brain.
00:51:10
BULENT ARSLAN, MD: You may have to go in just a little more to hit that.
00:51:12
MICHAEL D. DAKE, MD: You need a little more contrast or not?
00:51:15
JOHN A. KERN, MD: A little more. Let's just get that open.
00:51:22

MICHAEL D. DAKE, MD: That's good.
00:51:24
BULENT ARSLAN, MD: I think that should do it then. Okay. Lead the wire in.
00:51:37
ALAN H. MATSUMOTO, MD: So they're going to push the balloon cath – pull the balloon out of the way. Demag one so they can see the whole thing.
00:51:44
MICHAEL D. DAKE, MD: The nice thing of having that catheter, the diagnostic catheter in from the other groin.
00:51:48
ALAN H. MATSUMOTO, MD: They're going to open side-to-side some.
00:51:49
MICHAEL D. DAKE, MD: Everything doesn't have to be an exchange. So if there is a little perigraph fistula tract with some contrast getting around, if they've got the balloon right there, just up it goes, inflate again as opposed to taking each catheter in and out over a single access wire.
00:52:06
ALAN H. MATSUMOTO, MD: We'll just get ready to suspend respirations here.
00:52:09
BULENT ARSLAN, MD: Please suspend respirations.
00:52:10
ALAN H. MATSUMOTO, MD: Okay, here we go.
00:52:32
MICHAEL D. DAKE, MD: Well, let's take a look at that and let's maybe freeze. Alan, you can direct them where to freeze it so we see the relationship between all of the important structures there in terms of the proximal margin and the subclavian. Are we…?
00:52:45
ALAN H. MATSUMOTO, MD: Okay, Bob, why don't you freeze it there and window it so we can see the gold band on the device in relative to the subclavian artery. Window it there a little lighter so we can see through there.
00:53:03
BULENT ARSLAN, MD: It's right there. Right where we want it. Good.
00:53:06
ALAN H. MATSUMOTO, MD: So the gold band…
00:53:11
MICHAEL D. DAKE, MD: Explain to us, Alan. We can't quite see the – We can sort of see it.
00:53:13
BULENT ARSLAN, MD: I can't see it on our monitor.
00:53:17
Actually, let's save this image. I can't take a spot that will show the gold band better to everybody where it is.
00:53:22
ALAN H. MATSUMOTO, MD: Since we're running out of time, why don't you go ahead and describe where the gold band is?
00:53:26
BULENT ARSLAN, MD: Okay. The gold band is actually, if you look at the markers on the pigtail, it is corresponding to the fourth marker on the pigtail. It is a little bit angulated to the left of the screen, but it's actually sealing very nicely. The inferior border's sealing nicely and the superior border.
00:53:49

MICHAEL D. DAKE, MD: Yeah, the nice thing about this case as opposed to a very gothic, lesser curve, this had sort of a more Romanesque curve and you really get parallel walls there so there's no real lift up of – It's conforming nice to the transverse arch.
00:54:04
BULENT ARSLAN, MD: Actually, you can't compare on this image the pigtail marker catheter and the gold band. You can see it better with this view, and overlap with the angiogram.
00:54:13
MICHAEL D. DAKE, MD: You're happy, I assume, with your position relative to the subclavian right?
00:54:17
BULENT ARSLAN, MD: Yes, we are very happy.
00:54:18
MICHAEL D. DAKE, MD: It looks great.
00:54:20
ALAN H. MATSUMOTO, MD: Are you happy that there's a seal there?
00:54:24
MICHAEL D. DAKE, MD: Yeah, it looks good. I think, obviously the patient remaining heparinized, you've still got a little – it doesn't bother me, but obviously there's a little fill into that top little divot, which I think will be thrombosed by tomorrow.
00:54:38
BULENT ARSLAN, MD: The important thing is that part is not connected with the aneurysm sac, so that's just a…
00:54:44
MICHAEL D. DAKE, MD: That's a blind cul-de-sac that you have basically isolated. That will be gone by tomorrow. That looks great guys. Do you have any thoughts? Final thoughts? John? Bulent?
00:54:57
ALAN H. MATSUMOTO, MD: So, at this point Michael, I just want to mention that this live case will be on the archive and available for folks to see within an hour of this ending here and I guess since the case looks like it's pretty much completed other than closing up the incision side, we'll send it back to you since we're out of time.
00:55:15
MICHAEL D. DAKE, MD: Well, great job, Alan, moderating, and thanks to John, to Bulent, to the entire team you've got there in room 15. It's a beautiful example and congratulations on your success.
00:55:27
JOHN A. KERN, MD: Thank you. Thank you everyone. Thanks Mike.
00:55:31
ANNOUNCER: This has been an endovascular repair of a descending thoracic aortic aneurysm, with a Gore Tag thoracic endoprosthesis, performed from University of Virginia Health System Hospital in Charlottesville, Virginia. 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.
00:56:02
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