



**ROBOTIC-ASSISTED HYSTERECTOMY
HARTFORD HOSPITAL
HARTFORD, CONNECTICUT
October 2, 2007**

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ANNOUNCER: Welcome to Hartford Hospital in Hartford, Connecticut. Over the next hour you'll see a robotically-assisted hysterectomy. The procedure uses the da Vinci Surgical System, a sophisticated robotic platform designed to enable complex surgery using a minimally invasive approach. Surgeons benefit from the improved magnification and the dexterity while some of the patient advantages are less postoperative pain, smaller incisions, and shorter hospital stays. 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.

00:00:53

PAUL K. TULIKANGAS, MD, FACOG, FACS: Hello, and welcome. We're coming to you live from operating room 9 at Hartford Hospital in Hartford, Connecticut. Today we'll be performing a hysterectomy with robotic assistance. I'll be your host for the evening. I'm Dr. Paul Tulikangas. And joining me today will be Dr. Amy Brown, who will be performing the procedure. Before we get to Dr. Brown, I'd like to go over a few housekeeping items. First, we'll be answering your email questions during the webcast. To send us a question, just click the MDirect Access button on your screen. We welcome all questions and we'll try to get to all of them before the program's done. Second, an archive of the program will be posted later and it can be accessed through the website. And finally, CME credit is available for medical professionals who will be participating in tonight's broadcast. To receive the CME credit, complete the evaluation at the end of the program. I'd like to get over to Dr. Brown now, Dr. Amy Brown, if that's possible. Dr. Brown can kind of update us on where she is actually in the hysterectomy and introduce you to the other operating room staff. Dr. Brown?

00:01:57

AMY KIRKPATRICK BROWN, MD, MPH: Sure. Thank you, Dr. Tulikangas. Before I get into the actual procedure, which we have begun prior to the start of the webcast, I just want to introduce the team who's with me in the operating room today. At the patient's side I have Dr. Daniel Holmes as the patient side assistant. She's one of the chief OB/GYN residents here at Hartford Hospital. My surgical technician, Brenda, is on the patient's right side. Shelly is our circulating nurse today. And Dr. Palido at the patient's head is our anesthesiologist. Just to give a little background on this patient, she's a woman with a personal history of breast cancer who has undergone genetic testing and has been found to have a mutation in her BRCA-1 gene, which increases her risk of ovarian cancer. After discussion of her options, she has decided to undergo a prophylactic, or risk-reducing removal of the tubes and ovaries along with the hysterectomy. I'll now go back to the console and kind of update you on where we are to this point.

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Just for those of you who aren't of a medical background, I'm going to do a quick anatomy review for the audience. This is the uterus. The fundus, or the top of the uterus, is here. This is the patient's left fallopian tube and ovary. This is the patient's right fallopian tube

and ovary here. I have already divided on the left the round ligament, which is the supporting ligament, from the corner of the uterus to the side wall of the pelvis. And I've taken down the posterior peritoneum, which is the supporting tissue along the back and in the front. And what this has done, and you'll notice now as I zoom in, I have complete control over my camera and can really drive under that tube and ovary, which would otherwise be in the way, as this has exposed her uterine blood vessels right here. Other important anatomy to keep in mind as you do a hysterectomy is the ureter, which you can see running in the leaf of the peritoneum here. If it had not been this visible, I would have dissected it out farther, but it's quite easy to see as it courses underneath the peritoneum. This is the patient's uterosacral ligament, which is also a supporting ligament for the uterus and cervix. And then I've also divided the ovarian vessels. This is the pedicle where the ovarian vessels were divided. Underneath is the external iliac artery and vein and some lymph nodes lying along them. This patient does not have a diagnosis of cancer, so she does not require removal of any of the lymph nodes. Other structures of note for the non-medical here, this is the patient's sigmoid colon, or large bowel. The remainder of the patient's bowels are falling into her upper abdomen because we have the patient's bed tipped in a head-down, or Trendelenburg position. You can see on the right side as well her ureter here. Again, for those who aren't of a medical background you can see that this moves, or peristalsis, and that's how it can be differentiated from the blood vessels of the pelvis.

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What I'm going to do now is go ahead and begin the dissection on the right and explain as I'm doing that what the steps are that are involved in the robotic hysterectomy. You'll notice I have three instruments in. I have two hands, and what the robotic console allows me to do is maintain control of one instrument at all times, in this case a scissors that has a heat or electrocautery attached to it. I have two instruments that I can control with my left hand. The first is just a plain, grasping instrument that I can use for traction and retraction. And I'm going to use that to deflect the uterus up and towards the midline. I have a clutch pedal similar to the clutch in a car that lets me decide whether I'm going to control the number two instrument up here, which is holding the uterus, or the number three instrument here. They look very similar. The difference between the two is that this number three instrument has electrocautery attached and I can use this to divide her blood vessels. What I'm going to do to start, however, is to open up the spaces on her pelvic side wall here to allow us to access her ovarian vessels and divide them. This is the same procedure that would be performed in a standard open hysterectomy, and this is the round ligament here. And you can see I'm just dividing it with cautery, as opposed to stitching, which is traditional what's done in an open surgery. And by dividing this it allows me to enter the retroperitoneal space, or the potential spaces of the pelvis where I can then isolate the ovarian vessels. I'm just going to swap my two instruments here, my two and three, so that I can have cautery on the instruments I'm using in the pelvis.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: One thing to notice as Dr. Brown is doing this dissection is that the arms of the robotic instruments, these edges, they rotate in multiple degrees of freedom. In other words, it's very similar to the human wrist in that the instruments can be rotated in multiple planes. A limitation of traditional laparoscopy is that most of the instruments are simple graspers and they allow -- although they can allow fine dissection with the microscopy used for the dissection, the lack of ability to manipulate the actual graspers can confine the surgeon.

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AMY KIRKPATRICK BROWN, MD, MPH: And what you can see with this is I can angle my scissors in any direction, as Dr. Tulikangas was saying. Right now I have a relatively straight shot to divide this peritoneum, but as the surgery progresses you'll see there'll be times where I really want to be able to come up and over structures that I wish to avoid.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: You can notice as she grasps the tissue that the instrument really very closely approximates the actual movements of the human hand. At this time the ovary and the uterus are on the left side of your field. That's the fallopian tube, the tissue with the yellowish tinge to the left of the instrument in your field. The uterus, again, is in the high left side of the image that you're looking at now. And the blood vessels that go to the ovary are in the lower, or about the four o'clock position on your screen. Dr. Brown is now grasping the vessels. Those are the major blood vessels that go to the ovary.

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AMY KIRKPATRICK BROWN, MD, MPH: And before ligating the vessels, the other structure you want to ensure is not going to be compromised is the ureter, which in this patient's case is easily seen down low and medial to where the ovarian vessels are. Typically the ureter crosses over the patient's iliac vessels very close to where the ovarian vessels are located. We're lucky this is a thin patient and we can see this easily. If not, I would have had to dissect this out further to ensure that there was no injury during the cauterization. I tend to use simply a bipolar cautery for this as well as a monopolar cautery on my scissor tips. Other energy sources certainly can be used. Some people staple. Some people prefer to use something such as the Harmonic scalpel or the ligature. I find it's easier to use the bipolar because I have complete control over it and my assistant is not having to try and manipulate down to where I am.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: Amy, we've got a couple email questions already, and I think one of them is pretty topical. One person asked from our audience, "Do I have to have my ovaries removed in a robotic hysterectomy?" Do you want to take that one?

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AMY KIRKPATRICK BROWN, MD, MPH: Yeah. No, you certainly don't. Hysterectomy, despite some common perceptions, really is just removal of the uterus with or without the cervix. Adding removal of the ovaries depends upon why the patient is undergoing hysterectomy. In this case, it's for an elevated risk of cancer, so it certainly is important to remove the ovaries. As soon as I complete taking this vessel, I will show you what we would do if this patient were wishing to conserve her ovaries. That's an option for women undergoing hysterectomy either for benign fibroids or for cancers in the cervix. What you see here is you see her ovary and fallopian tube, and Dr. Holmes, I'm going to ask you to get a grasper in and retract this slightly laterally for me.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: So Dr. Holmes is at the patient's bedside, and she'll be using traditional laparoscopic instruments to assist Dr. Brown. And note here as she puts a traditional laparoscopic in, the difference in machinations of a simple instrument versus the robotic.

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AMY KIRKPATRICK BROWN, MD, MPH: Yeah. Dr. Holmes, why don't you just show them your instrument for a moment, that -- yeah, turn it -- that Dr. Holmes has the ability only to open and close and to rotate. And when you compare that to the robotic instrument, I can open and close and I can rotate as she does, but I also can rotate really with the motions of a human wrist. And all I'm doing to make the instrument do this is I'm turning my wrist in exactly the fashion the instrument is turning. So I'll let you go ahead and grab that, Dr. Holmes. If you can pull -- yeah, kind of up there. The other nice thing about the robot is you can see we have several instruments in here, and I can drive my camera down and around Dr. Holmes' instrument to allow me to access this peritoneum. And this is the posterior leaf of the broad ligament, the posterior peritoneum. And what I'm going to do is dissect this free off of her uterine vessels. This allows two things: it skeletonizes the uterine vessels so that when I attempt to cauterize them I have a safer cautery; it also will drop the ureter lateral to our operative field. And the ureter is running down in this area right now.

00:12:19

PAUL K. TULIKANGAS, MD, FACOG, FACS: Just to update people if people are joining us later, just to reorient them, we're performing a hysterectomy with robotic assistance. This is Dr. Amy Brown doing the surgery. I'm Dr. Paul Tulikangas, and I'm your host for the evening. Can we go back to the surgical footage? Just to reorient you on the surgical footage, right now the ovary is being elevated. It is the top right-hand part of your screen. And then in the left side of your screen is the uterus. And Dr. Brown right now is dissecting out the major blood vessels that go to the uterus, and she's using robotic-assisted instruments to do this.

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AMY KIRKPATRICK BROWN, MD, MPH: And for those of you who are surgeons in the audience who have done this laparoscopically, you can appreciate how still the camera is, how close in I can really get, and that I can angle these instruments to grab the peritoneum in a way that I'm not at all interfering with my cautery. So I can really come under and grab so I can cauterize safely above. I also have a focus capability on the console if things seem a little out of focus as I zoom in and out. And what I'm going to do is before this surgery started I placed a uterine manipulator with what's called a coring, or a plastic cup, around the uterine cervix to delineate the vaginal fornices. And what you can see the outline of here is this is the cup from the coring with the patient's uterosacral ligament. She has relatively prominent uterosacral ligaments and looks like possibly some old endometriosis, although she did not have a history of that. What the coring allows me to do is once I've gotten the vascular control of the uterus is it lets me make my vaginotomy access the vagina much more easily, and as long as I stay above where I've transected my uterines, it keeps the ureter far lateral. And I'm coming through my uterosacral here.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: For non-medical people who may be watching, right above the instrumentation is a dark spot on the surgical field that Dr. Brown's pointing to, and that's called endometriosis. That's a relatively common condition that is non-- it's a noncancerous condition, and it's when tissue that typically lines the inside of the uterus is found outside of the uterine cavity. It's not uncommon to find it in areas of the pelvis. It has been associated with infertility and can be associated also with pelvic pain. In our patient today she's had successful pregnancies and also has not had significant pain, so we didn't expect to find the endometriosis, but it's a finding that we do have today.

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AMY KIRKPATRICK BROWN, MD, MPH: And what I'm doing now is just continuing to peel this peritoneum off of her uterine vessels. And I don't want to get over-aggressive, I don't want to injure the vessels, but the farther I can take the peritoneum off, the more margin of safety I have that the ureter will be far lateral. And you can see there the start of her uterine vessels, an artery and a vein. I'm now going to change my position, and I'm going to have you let go, Dr. Holmes, of that. I'm going to manipulate the uterus backwards and downwards so that I can complete dissecting the bladder off of the uterus and cervix anteriorly. And that's called creating the bladder flap. The bladder sits typically right in front of the uterus. And in a patient like this who's had a caesarian section, it can even be a little more adherent. So we started the dissection on the left side previously in case it had taken longer than we had to show in the webcast, and it turns out this patient did not have significant adhesions, but she did have a few. This is the round ligament where we divided it previously. It just has a little bit of oozing, so I'm going to cauterize that again just for the sake of easier visibility.

00:16:06

PAUL K. TULIKANGAS, MD, FACOG, FACS: We've got a few more questions, Dr. Brown, I'd like to try to get to if we can.

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AMY KIRKPATRICK BROWN, MD, MPH: Sure.

00:16:10

PAUL K. TULIKANGAS, MD, FACOG, FACS: One question is, "I'm confused about how you can remove the uterus but not the cervix. I thought the cervix was the lower end of the uterus and connected just like your thumb to part of your hand. How could you remove a hand and leave the thumb?" Do you want to take that one?

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AMY KIRKPATRICK BROWN, MD, MPH: Sure. The way you can remove the uterus without the cervix is the uterus has a blood supply somewhat separate from the cervix and you can divide where I'm going to divide the uterine vessels, which I'll show you in a moment, you can divide the cervix there. And you actually don't remove the uterus from the vagina, you remove the uterus from an incision in the abdomen. People who are having procedures for pelvic prolapse or dropped uterus or dropped bladder, as people tend to call it, often will keep the cervix to add to their support. The benefits in terms of sexual functioning of keeping the cervix actually have not been proven, so really it's mostly if there's a medical reason to keep the cervix. Some people who have significant scar tissue, taking the cervix out could increase the amount of bleeding with the procedure and we choose to leave it just to decrease the blood loss. Dr. Tulikangas, I know you do more of these procedure for people who have prolapse. I don't know if you want to elaborate on that answer at all in terms of why you would leave the cervix behind.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: Sure. I think that's right. In our case we'll often perform a hysterectomy in conjunction with a procedure for a prolapsed uterus or sometimes do a robotic procedure for someone who has a cystocele, or a dropped bladder. Many times in those cases we'll perform a partial hysterectomy, or what they call a supracervical hysterectomy. In order to remove the body of the uterus without removing the cervix, you need to remove it through the abdomen, and some devices, such as uterine morcellators, have been developed for that. That's a tube that's about 15 mm in diameter that can be advanced in through the small incisions and we can core out the uterus with that device. I've got a nice question here, two from someone who's a surgical assistant in Ohio, and their question is, "Versus the traditional methods of hysterectomy, would you prefer using the robot, and does it eliminate any OR personnel?" And I think that's topical. The robot in our institution hasn't eliminated any operating room personnel, but it does require some additional training. And people skilled in robotic procedures are really dependent on their OR staff, who must also be trained for robotic assistance. We're lucky to have Shelly and Brenda with us today, who are excellent assistants.

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AMY KIRKPATRICK BROWN, MD, MPH: And I would have to agree with that. I think the people in a training institution that have the most difficulty with beginning robotics would actually be the surgical residents or the gynecology residents because it does somewhat limit their exposure, at least at the beginning of the surgeon's learning curve. Ultimately the goal is to have this be if it's something widely adopted a procedure that's taught to residents as part of their residency as with any other surgical technique. I think your reliance on your surgical tech is actually somewhat higher in the robotic procedure, if only because you aren't scrubbed in and you're really relying on your assistant and your surgical tech to provide retraction on the uterus and to really be able to change instruments, hand you things that you need if you have any complications with bleeding, which I'm hoping not to show you in today's procedure.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: We've got a -- what you're -- the image that you just saw a second ago was the actual robot and its attachments and the arms of the robot attached to the laparoscopic trocars. And what you're visualizing now is Dr. Brown at the surgical console. Why don't we take a second and show the setup of the actual robotic instrumentation.

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AMY KIRKPATRICK BROWN, MD, MPH: Actually, Dr. Tulikangas, I was about to divide the uterine vessel, so I don't know if you want to wait until after that's done. I think that's a nice part of the case.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: Sure. Let's go ahead and do that, and then we'll get to the setup. Yep.

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AMY KIRKPATRICK BROWN, MD, MPH: What you can see here just before I divide these is what I've done by taking down this peritoneum anteriorly in the bladder and the peritoneum posteriorly is I've exposed the shadow of that coring in the back here and in the front here. And I know my bladder is down, I know my rectum is down, and anything I do now above what we call the shoulder of that coring is safe. There's not much peritoneum surrounding my uterine vessel, so I should be able to cauterize them pretty cleanly, and there also is not a danger of injuring the ureters. If you don't skeletonize these vessels, you run into two problems, the first being the possibility of a ureteral injury, and the second being the fact that if you're trying to cauterize through a large amount of peritoneum you're not going to get as clean of a cauterization. And you can see I'm able with the angle to come up and over so I can really see what I'm doing as I ligate these vessels. For those surgeons in the audience, this would be exactly where you would place your Heaney or your Zeppelin or your Rodgers or whatever your clamp of choice is for your hysterectomy. I'm sorry, Dr. Tulikangas. That -- you can go ahead, if you'd like.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: No, let's stay. Let's watch the -- this is the uterine vessel right here being transected. As you look at your screen, the scissors passing through the middle of your screen, on the upper part is the uterus and on the lower part of the screen is the peritoneum of the pelvic side wall and the vagina. So after transecting these blood vessels, the only remaining part of the hysterectomy will be to incise the vagina and to remove the vagina from the cervix and uterus.

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AMY KIRKPATRICK BROWN, MD, MPH: And I have not transected these vessels on the other side, so I will go ahead and do that once I've done this. You see the uterine vessels have -- they're very sort of curly-que, in a nonscientific term, and they also often have multiple loops that the more you can cauterize the less bleeding you'll have. And that's why I go slow when I then divide them because if I find a vessel that I haven't totally coagulated, I'll be able to get that safely. My goal is to not enter the vagina here, it's just to expose it, and I think I've pretty much done as much as I'd like to do on this side. You can see vagina here with bladder down. I'm going to take a little of this fat just to drop those vessels. And see how as I free the adventitial tissue, the vessels really drop far lateral. I'm going to take one more piece of cautery here and one right below that before I go back to the left side of the uterus.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: People familiar with surgery in the audience can probably appreciate this, but really with the detail, with the magnification and the technical ability of the robotic instrumentation, we really feel like we can minimize blood loss with this procedure as well.

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AMY KIRKPATRICK BROWN, MD, MPH: Okay, Dr. Holmes, I'm going to have you let go of that [righted nexa] for me. And you can see I can use my clutch pedal to switch back and forth. My manipulator in the uterus is essentially just holding it in a relatively anteverted position. Most of my manipulation I'm doing with my instruments inside the abdomen. And that's not as important in this patient, but if I were doing this for a patient who had a significantly stenotic cervix, I couldn't really get a manipulator in, you can really do this

procedure without a vaginal manipulator, it just makes it a little more difficult. Dr. Holmes, I'm going to have you hold that again kind of over towards the middle, if possible.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: Dr. -- Amy, would this be a good time to break away to watch the setup?

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AMY KIRKPATRICK BROWN, MD, MPH: I think so, since this is really going to be just like it was on the other side.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: Sure. So while Dr. Brown takes down the uterine vessels in the left side, why don't we break away and show some of the operating room setup? We have a -- we had filmed ahead of time a different patient, and this is the setup of the actual laparoscopic instrumentation as well as the robot, and I think this will help to orient people a little bit more. Initially the procedure is begun, the patient has anesthesia, so she's fully asleep, and a needle is placed in through the skin into the abdominal cavity, and passed through the needle is carbon dioxide. Carbon dioxide then expands the abdominal cavity, moves the abdominal wall away from the vital organs, and allows us to place trocars directly into the abdomen. These trocars that you're looking at now are the portals by which the laparoscopic instruments will be passed into the abdomen. So this is the first trocar being placed, and then they're connecting the carbon dioxide gas to it. Once the initial trocars are in place, as you can see, there'll be a laparoscopic camera, which is in this case just above the belly button, or the umbilicus. And that's Dr. Holmes on the patient's left, and Dr. Brown on the patient's right. Dr. Brown is manipulating the intestines with traditional instrumentation.

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Here's the robot being driven in adjacent to the patient. The robot is heavy: it's on a large cart, and it has four arms. Dr. Brown at this point right now is grabbing the arm that attaches to the camera. Here you can see the robotic arm is attached to the actual trocars. On the left Dr. Holmes is attaching one of the robotic arms to the trocar. The instruments will then be passed -- attached to the robotic arms but passed through the trocars. And then these instruments are controlled by the console, which is about five feet away from the patient. This is the robotic instrumentation. This is a typical robotic instrument. This is a grasper that Dr. Brown's showing you. With the camera visualizing the abdominal and pelvic cavity, you can pass these instruments into the abdomen under direct visualization. Dr. Brown giving us the thumbs up there. And here you go. Here you see the robotic instrumentation, and this is slicing an adhesion in the abdomen and pelvic. So there's the robotic instruments working on the patients. Dr. Holmes on the patient's left, and then there's Dr. Brown manipulating the instruments.

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AMY KIRKPATRICK BROWN, MD, MPH: Okay. So you can see here I've pretty much divided most of the uterine vessels on this side as well. I'm just getting the last little bit here. And this is just dividing what I've coagulated. She has a little bit more bleeding from her uterine vessels on this side, still nothing significant and certainly much less than you would have in a traditional laparotomy. Again, because I've skeletonized the uterine vessels, I feel comfortable that I'm not endangering my ureter by my cautery in this part of the procedure. Now what I'm going to do now is I'm going to ask Brenda to go down below vaginally and aid in coming around and making my colpotomy by giving me some upward traction on the uterus. We also have in the vagina a balloon that we will fill with saline to occlude the vagina so we do not lose our pneumoperitoneum.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: So just to summarize again, right now we're looking from the belly button down into the pelvis. That's the uterus in the center of your

field, and the ovaries and fallopian tubes are on the left and right. And Dr. Brown just moved the left fallopian tube and ovary.

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AMY KIRKPATRICK BROWN, MD, MPH: And this looks like this patient also just happens to just have a small fibroid here. Generally a completely normal uterus would be flat coming down the back, and that also highlights one of the benefits of the robot is I can come in under this fibroid to be able to see posteriorly here. And you can see my ring right through here. As I touch, you get a sense of where that it.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: This is Brenda. They have some external footage here. What you just saw was Brenda, who's our surgical assistant, and she's pushing up on a manipulator that's on the cervix placed through the patient's vagina. And as she pushes up, she'll create a clearer field for Dr. Brown as she makes an incision in the vagina. This incision in the vagina will be a full circle, and it will remove the cervix and the uterus from the vagina.

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AMY KIRKPATRICK BROWN, MD, MPH: And then Brenda's going to give me some gentle upward traction here. Can you go up a little more towards the -- can you unstraighten actually? Can you put her back to anteverted actually? Just because of the fibroid. I think I'm going to have to do anteverted and then straightened. That's beautiful, yeah. And if you can just push in from there. Great.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: So what Brenda's doing there is by manipulating the uterus she can change the position so Dr. Brown is better able to visualize the area where she needs to make her incision. And here's the incision in the vagina. Pretty soon what you'll see is you'll see a blue ring. There it is. And that blue ring is placed again through the vagina adjacent to the cervix, and it's what marks our incision between the vagina and the cervix.

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AMY KIRKPATRICK BROWN, MD, MPH: And again, this patient's fibroid is making it somewhat more difficult to see, but I should be able to work around that by zooming my camera in underneath.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: Dr. Brown, we have a couple more questions. Maybe I'll field these while you're completing that vaginal incision.

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AMY KIRKPATRICK BROWN, MD, MPH: That would be great. If something particularly exciting is going on here, I'll certainly speak up.

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PAUL K. TULIKANGAS, MD, FACOG, FACS: Okay. One person emails in, "What type of anesthesia is commonly used for this type of procedure, intubation or spinal anesthesia?" And laparoscopic surgery is traditionally done through -- is traditionally done with general anesthesia. The general anesthesia is really needed to distend the abdomen with the carbon dioxide. So this is done with intubation and with general anesthesia. Another question is, "I have uterine prolapse stage 3. Would I be a candidate for the robotic procedure?" And today what we're seeing is a robotic hysterectomy and removal of both ovaries and tubes and fallopian tubes as a cancer prevention surgery. But hysterectomy is also often performed for symptomatic fibroid uteruses, refractory bleeding. And in my practice we treat a lot of women who have pelvic organ prolapse and urinary incontinence, and we perform many hysterectomies and pelvic support procedures robotically for these -- that's a nice picture -- for these problems as well.

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Just to go back to the surgical footage quickly, what you're seeing is the uterus in the top of the field with the ovaries and fallopian tubes on the right and left. And then that blue ring, which you'll see in a second, that blue ring is a ring that's placed in the vagina and is marking the incision between the vagina and the cervix. Another question we received by email is, "How long is the recovery time compared to the traditional procedure?" And the traditional procedure, if this procedure was done with an abdominal incision, in our institution typically a patient would spend probably two to three nights in the hospital. For their first couple weeks at home, they'd be pretty sore recovering from the abdominal incision, and probably back-to-work time would be about six weeks. For the robotic hysterectomy, because no large abdominal incision is needed, patients typically spend one night in the hospital. Most patients are sore for a couple days at home, but typically if a procedure is performed on a Monday or Tuesday, by the following weekend they'll be driving. And I've seen many of my patients typically going back to work at about three weeks. Patients are still tired when they go back to work, but the pain is much less, and I think that makes a big difference for recovery for these patients.

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Amy, would this be a good time to go through the slides or do you want to wait until we finish the colpotomy?

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AMY KIRKPATRICK BROWN, MD, MPH: Sure. I think we're almost done with the colpotomy, so if you go through the slides now when we're delivering the uterus, I'll get you back on live here to see the delivery of the uterus.

00:32:20

PAUL K. TULIKANGAS, MD, FACOG, FACS: That sounds great. To comply with the CME portion of this presentation, we would like to review a couple of slides. And I think the slides will be helping for everybody viewing this to provide an overview of the procedure. Could we go to the slides on the screen? Great. So this is a picture of Dr. Brown. She's a gynecologist/oncologist at Hartford Hospital. She's an OB/GYN who has specialized training in gynecologic oncology and gynecologic oncology cancer surgery. That's myself. I have a little more gray hair now, but I'm Paul Tulikangas, and I am an OB/GYN as well, and I have specialized training in what they call urogynecology and reconstructive pelvic surgery. And that specialized field deals mostly with women with prolapsed uteruses, bladders, and female urinary incontinence. Just as a general concept, minimally invasive surgery involves trying to perform procedures typically through smaller incisions. The smaller incisions usually allow for faster recovery and shorter length of hospital stay and generally by being less traumatic to tissue, less adhesion or scarring formation for the patients. Ideally, these procedures also have fewer complications, and most studies show reduced blood loss associated with these procedures. Laparoscopic surgery is probably the cornerstone for minimally invasive surgery for general surgery, gynecology, and most urology. Minimally invasive surgery is typically performed through small incisions in the abdomen as opposed to larger incisions which are often used for traditional surgery. The camera usually fits through a keyhole incision typically around the umbilicus, or the belly button, and then the accessory ports, or small incisions, are used to pass instruments into the abdomen. The drawbacks of conventional laparoscopic surgery is that the video camera usually has a 2D, or a flat image, so depth perception is somewhat limited. The instruments are rigid, as we showed in this slide, and the instruments can only be controlled at a distance. This decreases some precision, can increase surgeon fatigue, and makes complex operations more difficult. There we go. How do we overcome these drawbacks? Well, the da Vinci's been very helpful with that in that the da Vinci robotic procedure does provide better visualization with a 3-D video camera. The dexterity of the instrumentation has allowed us to overcome many of the technical challenges, and because there's better ergonomics, less surgeon fatigue and more surgeon independence. The da Vinci system is a computer-enhanced surgical system. There is a master-slave system with the master being in the console and

the slave area being the cart and the robotic arms. The surgeon operates at the console, and there's typically an assistant at the patient's bedside. The surgeon is immersed when they're at a console in a three-dimensional image of the surgical field, as we've seen Dr. Brown today. The wrist and finger movements of the Endowrist instruments really perform, as you see, much like a human wrist and allow increased dexterity and precision. The da Vinci systems are small enough and they fit through the keyhole incisions of traditional laparoscopy. In terms of safety, the FDA approved robotic surgery for general laparoscopic in 2000. The majority of robotic procedures have been the radical prostatectomy, which was approved in 2001. And because it, like a hysterectomy, is performed deep in the pelvis, they've really made huge advances with this procedure doing it robotically. There have been a number of cardiothoracic procedures that have been approved, and in 2005 the robotic assistance received approval for general urologic surgery as well as gynecologic laparoscopic surgical indications.

00:36:14

There are a number of hysterectomy types. Again, just to review, hysterectomy involves removal of the uterus. Removal of the fallopian tubes and ovaries is typically considered a separate procedure although often performed with a typical hysterectomy. A total abdominal hysterectomy is a hysterectomy performed through an abdominal incision. A vaginal hysterectomy is performed without any abdominal incisions and is typically performed through the vagina with the uterus and cervix removed through the vagina itself. Laparoscopic-assisted vaginal hysterectomy was a forerunner for the total laparoscopic hysterectomy. Laparoscopic-assisted vaginal hysterectomy involves laparoscopic assistance to remove the upper part of the uterus and sometimes the ovaries, and then the remainder of the procedure is completed through a vaginal incision.

00:36:58

AMY KIRKPATRICK BROWN, MD, MPH: Dr. Tulikangas, we're ready to deliver the uterus. I don't know if we can cut away from the slides and return to those later?

00:37:06

PAUL K. TULIKANGAS, MD, FACOG, FACS: Absolutely. Yep.

00:37:07

AMY KIRKPATRICK BROWN, MD, MPH: What you can see here, and I'll just narrate a little before Brenda starts pulling on the uterus, is you can see this is the edge of the vagina right here anteriorly. This is the balloon we had in the vagina inflated to keep us from losing our pneumoperitoneum. This is the ring we had around the cervix. And then you can actually see the edge of the manipulator, because once the uterus is freed, it's as easy to push it into the abdomen as it is to pull out. But we want to pull out and remove this from the patient's abdomen. And Brenda's going to do that by applying traction on the manipulator and just gentle twisting motion to deliver the uterus. If you take down the balloon, Brenda, you may have better luck. It looks kind of big for her vagina. Sorry, Dr. Tulikangas.

00:37:54

PAUL K. TULIKANGAS, MD, FACOG, FACS: No, this is great. Well, this is the hysterectomy. This, what you're observing now, is the removal of the uterus, fallopian tubes, and ovaries through the patient's vagina.

00:38:04

AMY KIRKPATRICK BROWN, MD, MPH: And because this patient is having this done for cancer prevention, I'm going to be cautious and I'm going to have the pathologist look at her specimen while she's still asleep just on the small chance that there's any malignancy found. If she needs further surgery, such as lymph node removal, we could accomplish that all in this one procedure. And what Brenda's doing is she's deflating that balloon a little so that the specimen can be removed more easily. That should be good. And sometimes -- I don't know if it will happen here -- sometimes the manipulator kind of pops out of the uterus and it takes a little more work to get it out. And it did. Dr. Holmes, can you go below and see if you can grab the uterus with a tenaculum or with a ring forcep or with your

finger? This does bring up one of the limitations and one of the considerations for doing a robotic hysterectomy is the size of the uterus. If it's being done for benign disease, it's not as much of an issue because the uterus can be removed in pieces. If it's being done for a cancer in the uterus, you have to make sure that the uterus is of a size that it will be able to fit through the woman's pelvis. A very large, bulky uterus will not be able to be removed robotically intact, and therefore is not a good choice for a cancer operation.

00:39:30

PAUL K. TULIKANGAS, MD, FACOG, FACS: Other limitations of the robot are often related to anesthesia in that typically when you perform these hysterectomies, the patients are placed in a head-down or Trendelenburg position. And the other limitation would be typically pulmonary disease or the difficulty a patient might have breathing when placed in a head-down position. But besides that, there are very few other absolute contraindications to performing the procedure robotically, and most procedures that could be performed either through incision or laparoscopically could be performed with robotic assistance.

00:40:04

AMY KIRKPATRICK BROWN, MD, MPH: And you can see Dr. Holmes' fingers there trying to deliver the uterus for us. What she'll do is pull it to where she can grab it, and then she can grab the cervix probably with an instrument. I can see if I can help by pushing this a little closer towards her. Do you have it, Danielle?

00:40:21

DANIELLE HOLMES, MD: No.

00:40:23

AMY KIRKPATRICK BROWN, MD, MPH: It's right at your fingers. You got it. You may need to put something on it, like a ring or a tenaculum, to really get that out, I think.

00:40:42

PAUL K. TULIKANGAS, MD, FACOG, FACS: One thing that you're seeing now is you're seeing the colon, or the sigmoid colon, in the surgical field. And the reason you're seeing that is because with the incision in the vagina, the carbon dioxide, which is usually distending the patient's abdomen, is leaking out through the vaginal incision. And this -- you see what happens if you don't have adequate visualization, the bowels start to flop into the field.

00:41:11

AMY KIRKPATRICK BROWN, MD, MPH: And this can be one of the more frustrating parts. Technically it's not a big part of the procedure, but you've done most of the work and then you get to this point and you just have to have patience in removing the specimen. And there it goes. And you can see the vaginal mucosa here. And what Dr. Holmes is going to do is she's going to place a sponge in a glove within the vagina, and that will help me keep my pneumoperitoneum while I suture the vaginal cuff. So Brenda, if you want to go ahead and change out my scissors for my needle driver unless you're down with Dr. Holmes. Perfect.

00:41:52

PAUL K. TULIKANGAS, MD, FACOG, FACS: So what you're looking at now is the specimen, and the cervix is the blanched, or white, area pointing to the left side of your screen. The top of the body of the uterus is pointing towards the right of your screen, and on the left you can see the fallopian tube and ovary. Let's get to a couple more questions while we're waiting. We have a question: "If a patient with a history of previous abdominal surgeries or C-sections and you're anticipating adhesions, how do you place your secondary ports if in fact you find adhesions to the anterior and lateral abdominal wall after placement of the scope?" Typically when performing robotic procedures, we do try to place the ports superior and lateral. With traditional laparoscopic surgery, it's sometimes difficult to access the pelvis, but robotic instrumentation allows a greater degree of flexibility and range of motion. So typically if we anticipate adhesions such as described in the question, we'll place the instrumentation superior and lateral. And you'll notice that today we replaced the ports as well.

00:42:56

AMY KIRKPATRICK BROWN, MD, MPH: And the other indication, really the reason why as an oncologist I tend to place my ports a little higher, is if I need to access this patient's lymph node basin up at her periaortic nodes, I need to have the ports higher to allow me to access that. With the aid of long instruments, bariatric instruments, you really can reach the vaginal cuff from relatively high, but it's not necessarily the converse. If you put your ports too low, you're not going to be able to see if you needed to remove periaortic lymph nodes.
00:43:27

PAUL K. TULIKANGAS, MD, FACOG, FACS: I have another question here: "How does this procedure compare to a traditional vaginal hysterectomy?" I'd be happy to answer that one. Vaginal hysterectomy is a relatively noninvasive way to perform a hysterectomy as well. Some of the limitations of a vaginal hysterectomy are [unusual] visualization of the upper abdomen and upper pelvis. It was likely because of these limitations that the laparoscopic-assisted hysterectomy was developed. And that gets into the different types of hysterectomy. If a procedure can be performed via a vaginal hysterectomy and visualization of the upper pelvis and the abdomen are not necessary, that's likely an equally less invasive procedure to perform.
00:44:15

I have another question here. A patient asks, "I have uterine prolapse, stage 3. Would I be a candidate for a robotic procedure? And that's actually a common indication for a robotic hysterectomy. In that case, in addition to performing a hysterectomy, we also need to perform support type procedures to prevent the post-hysterectomy vagina from descending or prolapsing, and as well as repairing a cystocele or rectocele that often occur with this. An advantage of robotics is that in addition to being able to perform the hysterectomy, we can also perform the needed repair surgeries as well, and the robotic instrumentation allows us more precise suturing in attachment of repair procedures to this typical hysterectomy. So yes, uterine prolapse stage 3 would be a common indication for a robotic hysterectomy and prolapse repair.
00:45:09

AMY KIRKPATRICK BROWN, MD, MPH: So Dr. Tulikangas, what I'm going to do now, speaking of suturing, and I think this will be of interest to anyone who does perform laparoscopy, is I've thrown my first stitch at my vaginal angle, and you're going to see how much easier the suturing is robotically than it would be with traditional laparoscopy, and that's really because of the ability to move the instruments in a more natural way. You'll see I have -- this is just a regular 0 Vicryl on a CT-1 needle. And because I just turn my wrist just as if I were doing this in an open case. The one thing you do need to keep in mind when you're suturing is you don't have a sense of feel. You have a virtual feel, but you can't actually feel how much tension you're putting on the suture, so it's important to really watch your knots and keep an eye on your suture. That's the only way you really know how much tension you're placing. But it's a much more natural suturing motion than it is with laparoscopic suturing. And that was me not feeling, and I think I probably hit my two robotic instruments onto each other. When you see it jump like that, that's the most common thing you've done as a surgeon not being able to tell you're doing it.
00:46:33

And then you can see anteriorly I've taken the bladder down. I have a sufficient vaginal margin here. And it's important as in any hysterectomy to make sure you get vaginal mucosa. And you can see that there. It's also important to be sure you don't include your sponge in your suture, and that's why I had asked Dr. Holmes to make sure she moved the sponge down in the glove. You want the vagina occluded so you don't lose gas, but you also don't want to cause problems by stitching too far into the vagina.
00:47:05

PAUL K. TULIKANGAS, MD, FACOG, FACS: I think surgeons who are familiar with laparoscopic techniques will appreciate here the advances that robotics allows in terms of

manipulating the suture and manipulating the needle, which can have a steep learning curve when you try to do that with straight laparoscopic instrumentation.

00:47:22

AMY KIRKPATRICK BROWN, MD, MPH: Dr. Holmes, I don't know if you'll be able to reach, but if you can can you place in your needle driver and give me a little bit of traction here? This is one possible limitation, that occasionally when you're down closing the vaginal cuff, your assistant's instruments just aren't long enough to reach from that left upper quadrant port. Can you come in any more, Danielle? Is the trocar all the way in?

00:47:48

DANIELLE HOLMES, MD: Yeah. [Unintelligible.]

00:47:51

AMY KIRKPATRICK BROWN, MD, MPH: Yeah, if we have a smooth grasper, that would be great. And the reason I'm going to have her follow me is to keep tension on my closure so I don't end up with a gap in my vaginal closure.

00:48:03

PAUL K. TULIKANGAS, MD, FACOG, FACS: So that's a traditional laparoscopic instrument that Dr. Holmes just advanced into the pelvis in the lower part of your screen.

00:48:26

AMY KIRKPATRICK BROWN, MD, MPH: And again, I'm ensuring I get vaginal mucosa both front and back. And after this bite, I'm going to actually have Dr. Holmes let go and I'm going to have her pass in something called the [lapro tie] device, which is another way of securing your ties and your closures laparoscopically. I could tie this again, but for the sake of teaching I'm going to show the other option, which is the [lapro tie]. It's a Vicryl clip that essentially functions as a suture but it allows you -- the most important case is if you come to the end and you're running short on suture, you don't have quite enough, you don't need much of a tail to place this. And she just slides it over the suture and slides it down towards the cuff as close as she can. And then she's going to squeeze, and that will apply the clip. There you go. And squeeze down. Good. For some reason that one didn't fire, so I'm just going to take this out and she'll get another one. It is Vicryl, so it should dissolve, but I'm just going to put it in the vagina and we'll remove that when we remove the sponge.

00:49:47

PAUL K. TULIKANGAS, MD, FACOG, FACS: I have a few more questions. Maybe we can go through a couple questions here. Yeah. I have -- a patient in her mid-30s has multiple fibroids. Would she be a candidate for this surgery? She would be a candidate. Fibroids are a common condition, so there are some medical management options for patients with multiple fibroids. But if a hysterectomy was selected as part of the treatment option, then robotic hysterectomy would certainly be an option for that patient. Typically in a 30-year-old woman with fibroids, the risk of actually having a cancer is very low, and some of the morcellation techniques, or ability to deliver the uterus through the vagina, could be used so that a larger specimen could probably be removed. So she certainly would be a candidate for this procedure.

00:50:36

AMY KIRKPATRICK BROWN, MD, MPH: I would agree with that.

00:50:40

PAUL K. TULIKANGAS, MD, FACOG, FACS: "What if a patient had previous abdominal surgery and also has endometriosis? Might this affect her hysterectomy?" Dr. Brown, do you want to take that one?

00:50:49

AMY KIRKPATRICK BROWN, MD, MPH: You know, it certainly will affect it in that a patient both with prior surgery and with endometriosis is more likely to have scar tissue. It doesn't preclude someone from having a robotic hysterectomy. As you can see, our ability to visualize really is in a way much superior even to an open surgery. So women with endometriosis, with scar tissue, definitely can attempt robotic hysterectomy. If they have

had no significant adhesions involving the bowel, with multiple loops of bowel involved, that's really the only true contraindication. Otherwise it's certainly a reasonable place to start. But you also have to go into the surgery knowing that you can never 100% guarantee a robotic surgery. You can have surprises in terms of scar tissue where you didn't expect it, but for most women endometriosis is a common indication for hysterectomy that certainly can be performed robotically.

00:51:45

PAUL K. TULIKANGAS, MD, FACOG, FACS: And in fact, our patient today did have mild endometriosis, and we were able to manipulate around that without any real difficulties.

00:51:53

AMY KIRKPATRICK BROWN, MD, MPH: And I think it's a benefit to robotic as opposed to straight laparoscopy in that case because of the ability, really particular with the ureter, which is what I would be most worried about in a patient with endometriosis is the ability to keep the ureter safe and out of my operative field. And I feel much more comfortable doing that robotically than laparoscopically because of the ability to see much better. And the three-dimensional vision, which you can't appreciate on the television monitor or on the computer screen but really makes a big difference in the dissection when you're doing this procedure.

00:52:26

PAUL K. TULIKANGAS, MD, FACOG, FACS: Dr. Brown, another patient asks, is a robotic hysterectomy more expensive than a traditional hysterectomy for the patient?

00:52:32

AMY KIRKPATRICK BROWN, MD, MPH: I'll say at this point it's not. It actually in terms of insurance coverage is considered the same procedure as a laparoscopic. There's no separate way to charge for the robotic approach. I can't promise that insurance companies will never change that, but as of now it should be no more expensive to the patient than a standard hysterectomy. In some ways if they go back to work faster, it might even be cheaper when you consider all the costs, including time out of work.

00:53:01

PAUL K. TULIKANGAS, MD, FACOG, FACS: Hartford Hospital has really made an investment in this technology, and at this point the cost to the insurance company for a robotic hysterectomy is the same as for a traditional hysterectomy.

00:53:16

AMY KIRKPATRICK BROWN, MD, MPH: And what you can see here is there is only a very small portion of the vaginal cuff remaining open, and I'm going to place one to two more sutures in here just to close that remaining portion of vagina.

00:53:29

PAUL K. TULIKANGAS, MD, FACOG, FACS: So just to recap now, or if anybody's joined us late, this is Dr. Amy Brown completing a hysterectomy. And what you're looking at now is what we call the vaginal cuff, or the top of the vagina. Typically the top of the vagina attaches to the cervix and the uterus, but in this case the cervix, uterus, ovaries and fallopian tubes have been removed and the remaining area to be closed is the top of the vagina. So Dr. Brown is suturing that with robotic instrumentation. Maybe I could take a second now and get to the last couple slides.

00:54:07

AMY KIRKPATRICK BROWN, MD, MPH: Oh, sure.

00:54:10

PAUL K. TULIKANGAS, MD, FACOG, FACS: So to summarize, the da Vinci hysterectomy does represent a technical advantage in terms of performing hysterectomy. It does allow conversion of laparotomy to a laparoscopic procedure for many patients. It allows more complex procedures to be performed more easily. An example of that might be in addition to a traditional hysterectomy, patients with cancer might need lymph node dissections, patients with pelvic organ prolapse might need additional support procedures, and the

robotic instrumentation allows these procedures to be performed more easily. It also decreases your reliance on surgical assistance. You can see although Dr. Holmes has done a tremendous job assisting during this procedure. Dr. Brown has really been able to perform most of the procedure herself.

00:54:54

AMY KIRKPATRICK BROWN, MD, MPH: Okay, Dr. Holmes, I'll have you bring again [unintelligible]. After Dr. Holmes places this lapro tie, for the surgeons in the audience I'll show you how this is an excellent technique for someone who does need a node dissection because you'll be able to see quite easily the periaortic nodal basin and how well visualized this can be using the robotic technique. And for those of you who use the lapro tie, you know, the first one did not apply appropriately. I've found that's not uncommon. As with any disposable instrument, sometimes the applicator does not work as well as you'd like. Sometimes if you don't have the angle just right it doesn't work, and I think that's probably a safety feature of it, that you must have the angle correctly along the suture to ensure that you're not getting any unwanted tissue in your closure. Okay? And Dr. Holmes is now removing that suture for me. And just what you can see is if this patient did have a cancer and required a staging procedure or lymph node dissection, you can see the areas where the nodal tissue lies. On this side you see her iliac artery and you also see right below that her iliac vein. And the nodal tissue to be removed would be these lymph nodes here as well as lymph nodes tucked under her vein in that area. In terms of her periaortic lymph nodes, you can trace here you see her external iliac vessel right here. This is the ureter, which crosses over at the bifurcation. And you can see as I come up that if this is the bifurcation of her aorta, and if I needed to remove her periaortic nodes, really they're lying right here over the inferior vena cava, and you can see those pulsations. And you can get up to the level of the duodenum quite easily if you have to. It's not indicated in this patient, so I will not be able to actually show you that today, but I hope you can appreciate that technically that would be quite a straightforward access in someone of this body habitus. Obviously in a larger patient it's more difficult.

00:57:02

So here you see the closed vaginal cuff. I'll just have Dr. Holmes give a little bit of irrigation to make sure that everything is hemostatic. It certainly appears to be, and you can see that through the entire procedure we really have had almost no blood loss, and that's relatively common with the robotic hysterectomy. Are there any other questions from the audience, Dr. Tulikangas, before we finish?

00:57:24

PAUL K. TULIKANGAS, MD, FACOG, FACS: I think we've covered most of them. We have a few other questions, but I think we've covered it in our discussion throughout the surgery. Yeah. I think that covers most of it. Would you like to recap the procedure, maybe summarize the different steps that you went through?

00:57:40

AMY KIRKPATRICK BROWN, MD, MPH: Yeah. So just essentially, I'll go back to the patient's abdomen. You can see the cuff is dry. This is the pedicle where I divided her ovarian vessels here. This is the round ligament that was divided. That's the first steps in the procedure. You can see the bladder has been dissected free. It's off of both the cervix, the lower uterine segment, and the upper vagina, and that was even in a patient with a couple prior Caesarean sections. You can see the uterine vessel pedicles right here, which I won't touch too much so as not to cause any bleeding. And you can see the vaginal cuff here nicely closed. So in this patient she also does have some urinary incontinence, so she's going to proceed as well with the urinary incontinence procedure, but I think at this point we really have concluded the robotic hysterectomy, and I hope people found this information useful. Certainly I think it's a good option for patients to have, and I'd like to thank everybody really for logging in, and feel free to email any further questions. And if you're doing this for CME, Dr. Tulikangas will review how to obtain those credits.

00:58:49

PAUL K. TULIKANGAS, MD, FACOG, FACS: Great. Thanks, Dr. Brown. Just to review our last few slides then, in terms of referral guidelines for patients who might be referred for possible robotic hysterectomies, for Dr. Brown, endometrial cancer patients are candidates for robotic hysterectomies, patients with precancerous cervical lesions possibly desiring hysterectomy or 1A1 cervical cancers. Patients with adnexal masses with relatively low suspicions of cancer. We did have a few questions emailed to us tonight about possible patients with ovarian cysts, and those certainly can be managed robotically as well. Unexpected cancers where a hysterectomy is performed and then a staging procedure is required later, that staging procedure can be performed robotically. Patients with a genetic susceptibility to gynecologic cancer who are desiring surgery. Our patient tonight, that was the reason for her referral. Patients who are referred should be able to tolerate a prolonged Trendelenburg procedure. That's when the patient's head is down. So the limitation really to most of these procedures is underlying pulmonary disease. In the near future, Dr. Brown is hoping to offer patients who have cervical cancer a more extensive hysterectomy called a radical hysterectomy for invasive cervical cancer. With regards to our practice in urogynecology, we perform hysterectomies also for benign gynecologic conditions. And in addition to performing hysterectomy, we're also performing robotic procedures for pelvic organ prolapse, such as cystoceles, rectoceles, or uterine prolapse. I think that's it for tonight. Thank you very much for joining us this evening. I'd like to sign off. Any last comments, Dr. Brown?

01:00:39

AMY KIRKPATRICK BROWN, MD, MPH: I don't think so. Again, thank you for joining us. I'm going to go scrub back in because even though the robotic part of the procedure is done, we need to remove the instruments and close the patient's small skin incisions.

01:00:53

PAUL K. TULIKANGAS, MD, FACOG, FACS: Thanks. Stay classy, Hartford.

01:01:07

ANNOUNCER: Thank you for watching this robotically assisted hysterectomy performed from Hartford Hospital in Hartford, Connecticut. 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.

01:01:32

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