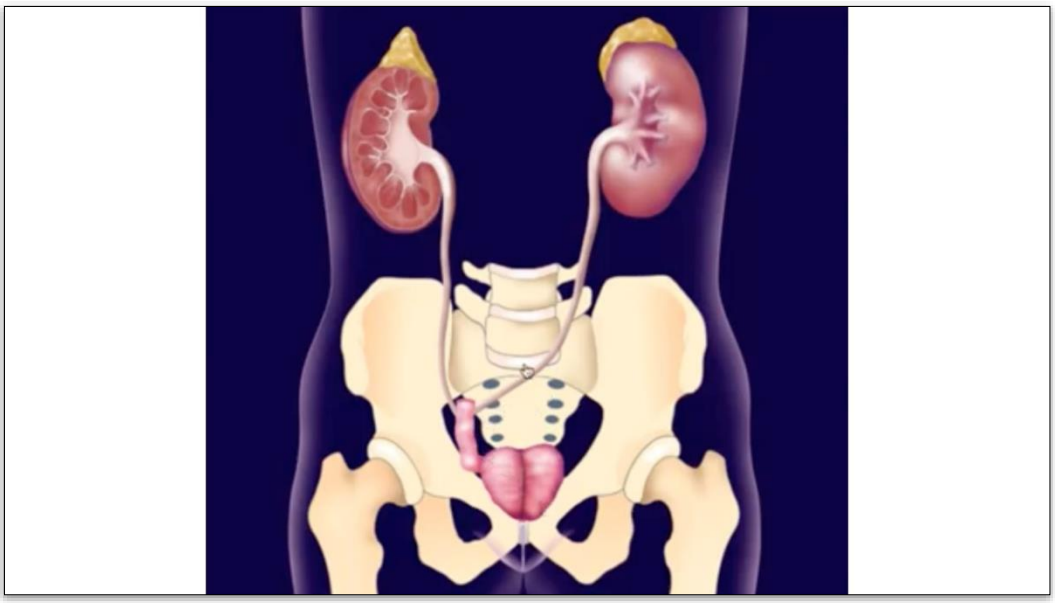
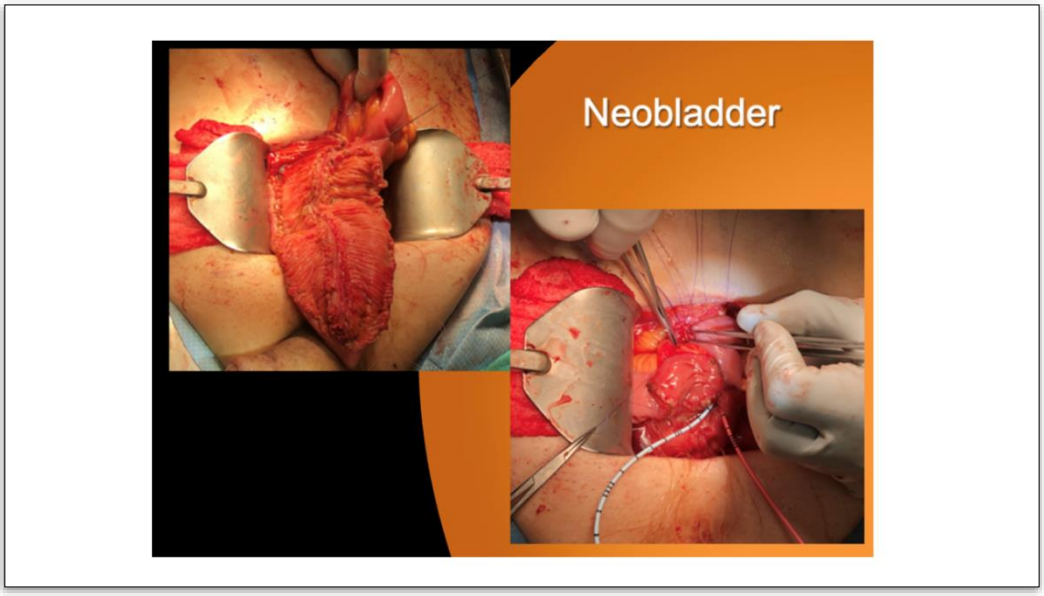
The Basics of Neobladder and Indiana Pouch

Dr. Alexander Kutikov:



Let's see. Let's see if I can get through some of these other diversions. This is a neobladder. A neobladder urinary diversion, again, uses a larger segment of small bowel. It basically creates a reservoir where the patients can urinate through their urethra. Some people ask me what a neobladder looks like during surgery. I put a slide there. If you don't want to see a picture from inside a surgery, I would just turn away from the screen now, and I'll just keep it up for 10, 15 seconds. But here's what a neobladder looks like interoperatively.

This is the small bowel opened up, detubularised and kind of sewn together. This is a Studer neobladder, which most people use and that's what I use in practice. This is where the neobladder has kind of folded on itself and now the ureters are being sewn in into the neobladder. That's what it looks like during surgery. But let's talk about why somebody would choose a neobladder and why not. There're trade-offs. First, one needs to understand that there is chance of incontinence. I quote patients approximately 10% chance of daytime incontinence. When somebody coughs, sneezes, picks up something heavy, stand up too fast, you can leak some urine and need a pad or it depends. Hopefully those chances are even less, but you got to sort of use the 10% risk as the risk to make your decision. That's daytime. Nighttime is more difficult to predict. In all of us who have their native bladder, what happens is, when our bladder fills, when we're sleeping, our sphincter, our muscle that keeps the urine in, tightens automatically. That's a spinal reflex.



Dr. Alexander Kutikov:

There's basically our bladder sends a signal to our spinal cord to tighten the sphincter. In patients who have a neobladder, that obviously doesn't happen because there was no signal from the bladder to tighten the sphincter. About 20% of patients who have neobladders leak at night, when they are the deep sleepers and they're dry during the day. But when they fall asleep, their sphincter loosens up and they don't have the reflux to tighten it, and they leak at night. It can be a frustrating problem. It may require other surgeries or a lot

of times people sort of just handle it and either put a condom catheter or it depends, but it can be frustrating. That's a risk that one has to sort of understand before getting into a neobladder. Hypercontinence, this is another risk. Hypercontinence, it's the opposite problem, you can't empty your neobladder. What happens then? You need to catheterize and you would need to catheterize for the rest of one's life. Sometimes this is the deal breaker about a neobladder, although, and then the risks are five to 10%. In women they're much higher, 20 to 30%.

But sometimes this is a little bit of a deal-breaker for folks. They just don't want to risk that. But also perioperative complication. Recovery, this is a bigger surgery. There is multiple drains that are coming out of you. You're walking around, you're waiting for this bladder to heal. For our elderly and frail patients, we usually don't spend too much time discussing this because they're not great candidates. We're trying to get them through one of the biggest operations that we do in surgery and adding another layer of complexity, like a neobladder, is just not a great idea.

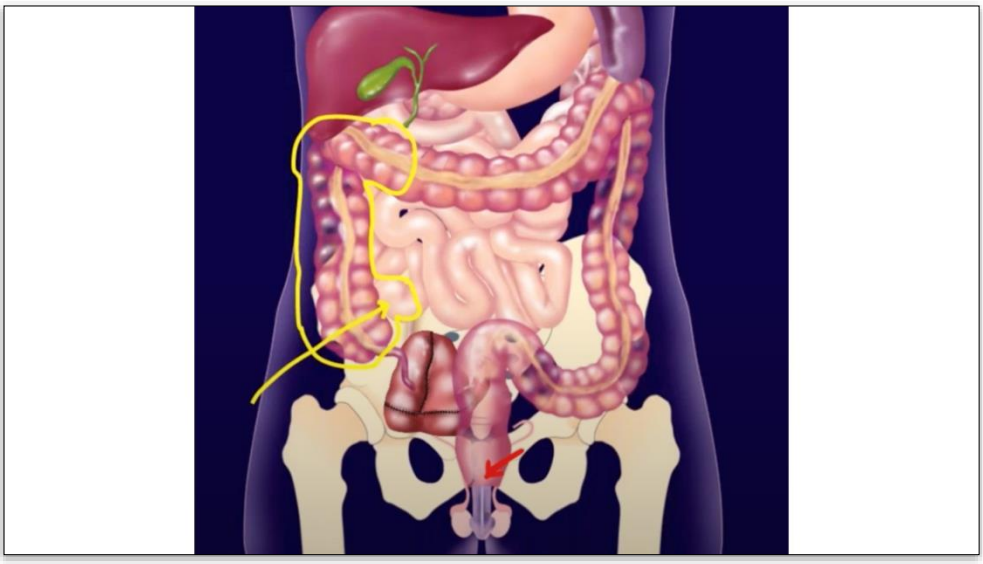
Dr. Alexander Kutikov:

What about if you signed up for a neobladder? Do you always get one? Well, most of the time you do. But I tell patients there's three scenarios where we may need to walk away from a neobladder using a game time decision. I tell them it's when the urethra has some cancer on it. It's always very important to send a margin, a urethra margin at the time of the neobladder surgery and for the pathologist to tell the surgeons that that edge is clean. Because if there is cancer in the urethra, you can't obviously take more urethra because you will lose the continence mechanism and you can't leave cancer behind. That's one possibility. The other possibility is that sometimes when somebody becomes unstable during surgery, something is happening with their heart, with their lungs. It's very rare, especially for patients who are good neobladder candidates. But sometimes the anesthesiologists can tell the surgeon that, "Hey, we really need to get this patient off the table." Neobladder just takes more time than an ileal conduit. That's a very unusual sort of scenario.

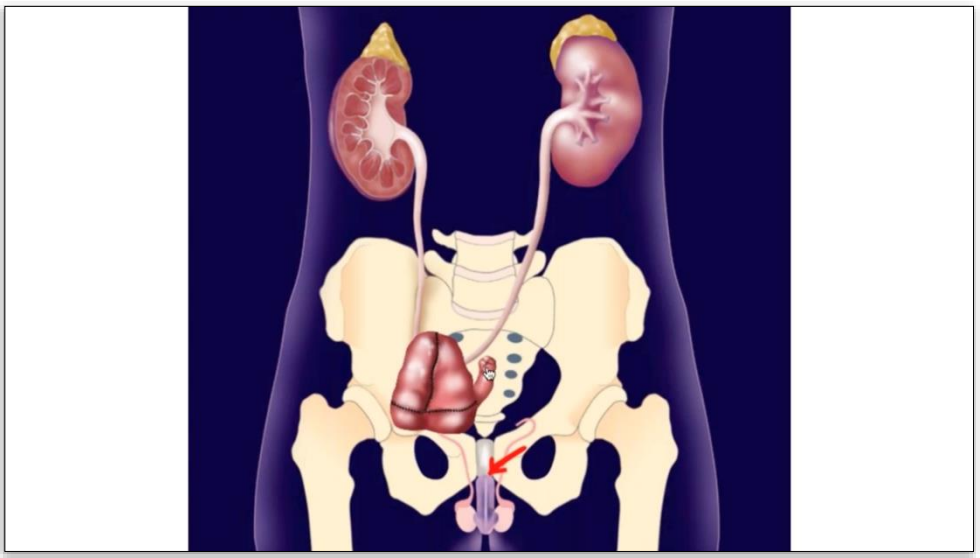
The other scenario is where we find more disease. Again, this is a discussion with you and your surgeon before surgery, but sometimes we decide that if there is a frank lymph node positive disease or there's sort of diseases concerning, then we'll go with a simpler operation in order to recover faster and get to subsequent therapy faster.

Dr. Alexander Kutikov:

Let's talk a little bit about Indiana pouch. Remember I told you about this right colon. That's what we use, and we make a catheterizable channel that you catheterize. Sometimes you can put in a belly button, but sometimes you turn this around and put the stoma around here. This is a good option for patients who don't want a bag, who don't



want an appliance, but whose pelvis has been remediated or they have sort of a degree of malignancy where you can't offer them a neobladder. And for whom it's very important not to have an appliance. This is a good diversion. Sometimes we offer to women who really don't want to self catheterize because catheterizing for women can be difficult, especially as they lose their dexterity with age.



As the body ages, it becomes more and more difficult to catheterize the urethra. This is a diversion sometimes that we use associated with quite high complication rates associated with infection risks. I offer it to my patients, but this is not something we rush to do before really discussing with patients and making sure that this is what they want.

Sexual Function, Robotic versus Open Surgery, and Research

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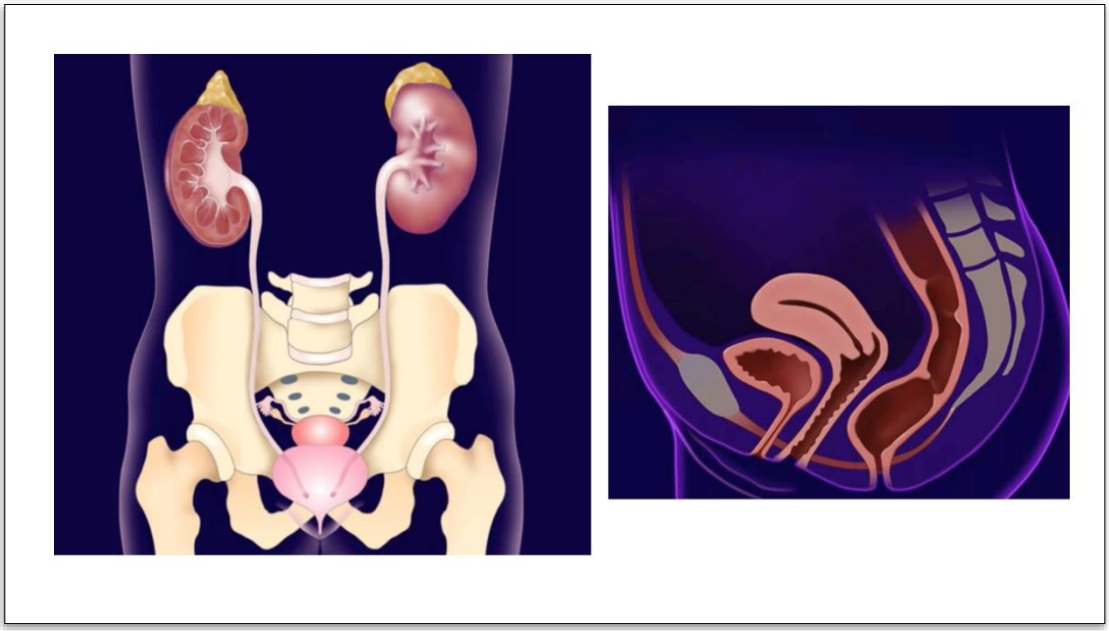

Let's talk about sexual dysfunction. This is a little bit of a conversation, and I know we don't have a lot of time, but this is a conversation about what needs to be removed from the female pelvis when one does a cystectomy. On this picture, this is the woman is facing this way. This is her back, and this is the pubic symphysis, this is the rectum, and this is the bladder and urethra. Classically, what's removed is the anterior vagina, the anterior wall of the vagina, the uterus. Here are the ovaries and the fallopian tubes are removed as well. Kind of this is what's called an anterior exenteration. What's really we understand better, is that we don't always have to remove all that, especially women who are active.

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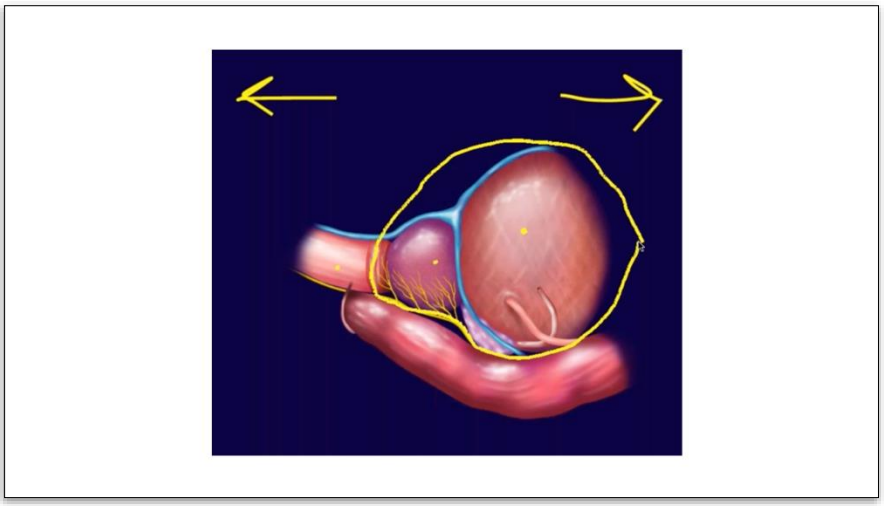
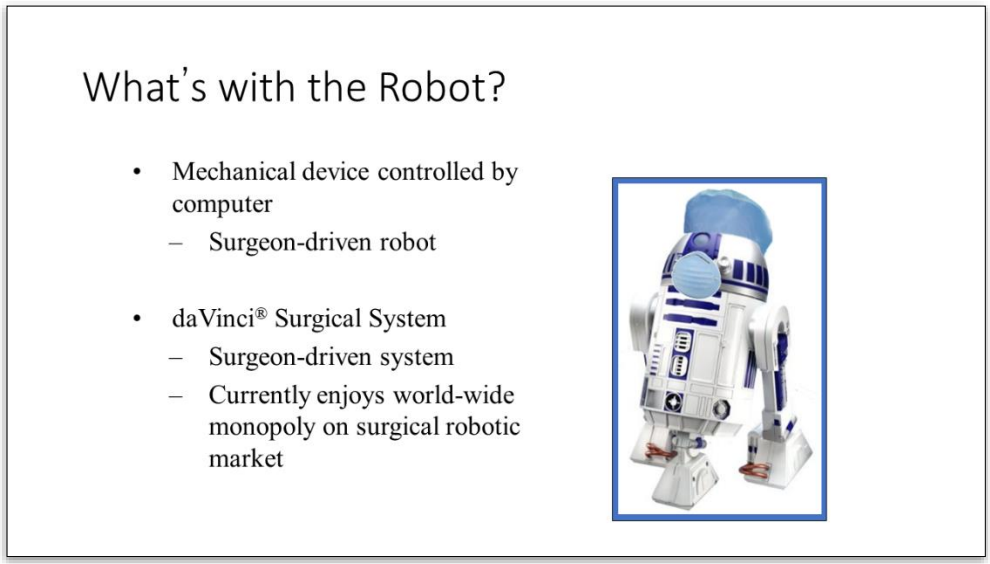


By not removing the uterus, we can prevent some degree of prolapse, which can happen when you remove these public structures. For some women we offer, depending on the location of their disease, but if there is really no concern for disease that's really budding the vagina, to really offer a vaginal and the uterus sparing cystectomy. We offer that more and more these days and it's a discussion whether to take their ovaries and fallopian tubes depending on menopausal status, depending on patient's age. We usually discuss with the patient's gynecological colleagues about their opinions regarding that. If it's a vaginal sparing cystectomy, generally sexual function is largely preserved. Even when the anterior vagina is resected, there can be some dyspareunia, there can be some pain with intercourse, but usually patients can still be sexually active. For male patients, we remove the prostate, the seminal vesicles, and the bladder. Ejaculations are dry. These are the nerves. These are the nerves that innovate the corporal bodies of the penis.

Even if there's nerve sparing cystectomies that are done, the erections are quite poor, but sensation is intact, is always intact. Things like an orgasm that's one-on-ones brain. Those functions are intact so people can be intimate but the erections are poor after cystectomy, generally. Not in everybody, but generally. There are ways to get erections back. Usually the oral medications don't work, but there's injections, there's a lot of options for men who are interested to stay sexually active. So an important conversation to have with one's surgeon.

Dr. Alexander Kutikov:

Open versus robotic cystectomy, what I'll leave you with is, it doesn't matter. Choose a surgeon and choose a busy surgeon who knows what they're doing and use their preference. There's been some concerns about robotic cystectomy recently where the robot is this platform where you use this device to sort of give you 3D visualization and degrees of



freedom when moving the instruments. But there were some concerns that after this paper in the gynecological surgery with cervical cancer, where the results were far inferior with the robotic surgery.

But thankfully, in urological oncology, and there was an FDA warning about it, but in urologic surgery, although concerns were raised over the years about recurrence patterns, because the belly is insufflate and some of this urine can get aerosolized, and there were some different recurrence patterns that we were seeing with robotic surgery versus open surgery. Then that there were more strictures with robotic surgery. There's a recent report with these newer techniques. But in the experienced hands, there were two trials that were now done that we basically don't see robotics to be an inferior operation. Whether it's superior operation, it is very much debated and at least right now there's really no evidence for that. A lot of us busy robotic surgeons that I do a lot of robotic surgery, but cystectomy, I did it for five years robotically and I went back to doing it with a classic open incision because I do think the onus is on robotic cystectomy to show superiority before we totally shift that way. It really hasn't happened yet here. But it's not the driver, it's the car. Choose a surgeon and use their most preferred method.

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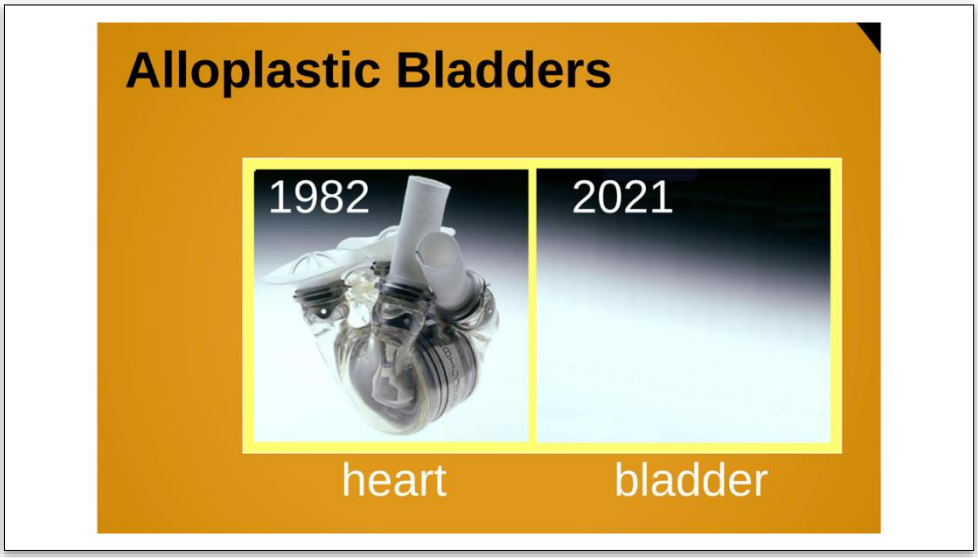

But certainly both procedures are considered now the standard of care and the recovery is very similar from one versus another, especially if the surgeons use small incisions to do the open cystectomy. It really is a little bit of dealer's choice and just use a center and a surgeon that you prefer. For instance, at Fox Chase, we do both. We do both open and robotic cystectomy. I want to spend two minutes because this comes up all the time. What about artificial bladder? When are people are going to make a bladder? We've had an artificial heart since 1982. Why there is no artificial bladder? It's not for lack of effort. People have tried. It's just a very difficult problem to tackle. Urine encrusts these synthetic devices and the connections tend to fail, and people get bad infections with prosthetic devices

in the urinary tract. These are kind of the best data that we have. There's been really a lack of effort in the space since the '90s. With modern materials, I think that effort needs to be renewed, but it's something that I'm very interested in, but it's certainly this has largely been abandoned.

It was abandoned because tissue engineering was really holding much promise and there was all these papers that were coming out where we were looking like we were very close, especially in animal models. But then when we did these trials in patients, there were many problems and these bladders just did not take. This was not a new bladder, this was just trying to make a bladder bigger in some patients who were born congenitally with non-functioning bladders. There was a company that was started that tried to make a synthetic ileal conduit by using cells from the patient and using a scaffold and growing an ileal conduit. This was Tengion, Inc. that unfortunately went into bankruptcy in 2014.

Let's stop here because I can talk a little bit about sort of how to save the bladder, but that's a larger talk. But what I'll tell you is, we're not there either. This is a study that we just published showing that even when we try to save the bladder and it looks very good on cystoscopy, 25% of the time, we actually miss muscle-invasive disease.