

Prostate Cancer Treatment: What's Best for You

David Thiel, MD

Staff Urologist, Assistant Professor, Mayo College of Medicine, Jacksonville, FL

Treatment Options: Surgical Options for Prostatectomy

David Thiel, MD

In discussing clinically localized prostate cancer when attending events like this, it is pretty easy to get your perspective lost. I start out every prostate cancer talk, especially with a group like this, in saying number one, when you look at their estimated risk of dying from prostate cancer, you are still much more likely to die of heart disease, lung cancer, stroke, COPD, than you are prostate cancer. Brian touched on this: prostate cancer prevention and deep screening is not for you guys who weigh 300 lb, eat ten Big Macs a day, drink 20 beers a week; you have got to take that stuff into consideration first before you start playing the prostate cancer prevention game because you are more likely to die of these other things. You need to protect yourself from these other things before you focus on prostate cancer.

Someone asked an earlier speaker about prostate screening and he hedged a little bit because he said it is a controversial topic. In my mind, it is not. What we are doing in a prostate cancer screening beats any other cancer, and the serum PSA beats any other serum marker for cancer; I challenge anybody to give us anything close to PSA. Since 1995, death rates from prostate cancer have gone from 40,000 to 27,000. Breast cancer, which is much more highly funded and publicized, has gone down 12%. We have had a 33% decrease in mortality over the same time period. I think what we are doing is working.

When you talk about prostate cancer therapy goals, surgery, or radiation, you are trying to get rid of the cancer first, preserve incontinence second, the third that I add in is to prevent regret so you don't regret what you did, and then lastly, although most of us put it first, is to preserve erections. All that equals quality of life. Winston went through all your options, and there is a ton of them; that is what is the problem with prostate cancer is you almost have too many options as a patient to decide what to do. It is all over this, this little item right here, the prostate. Well, why is what therapy you pick so important? The reason is this: if you look at your prostate, that little organ I just showed you lies here, the problem in treating prostate cancer is not the prostate; it is where the prostate lies. You have got the bladder right above it, the rectum right behind it, and then probably most importantly when you look at the prostate is this area here, the urinary sphincter; that is what controls your ability to hold urine.

So any therapy you elect is going to affect the bladder, the rectum, and the urinary sphincter, and that is what leads to our quality of life issues; add into that erection problems. The neurovascular bundles which lie at the 5:00 and 7:00 positions are what control erections; many people think this is what controls sensation of the penis and it is

not. Even if you take these neurovascular bundles, you will still be able to feel your penis; you just won't have good blood flow to get good erections.

Surgical removal of the prostate: there are three basic ways of doing that. This is perineal prostatectomy coming above the rectum, underneath the scrotum. We don't do this at Mayo and I don't believe there are many people still performing this. On the left, you see open prostatectomy; on the right, you see robotic prostatectomy. Pretty much the same operation: the only difference is the incisions that we are using to approach it. For the da Vinci Surgical System, which I will show you how that is performed here in a second, the way that came about was a surgeon was approached by SRI International to develop a field robot for wounded soldiers. Obviously, the current da Vinci system was too expensive and not practical for the battlefield, so together with engineers and venture capital money, they started Intuitive Corporation.

In 1999, the company posted an \$18 million loss; the problem was the procedure was marketed for gall bladder surgery. Gall bladder surgery is already pretty much figured out; if anybody has had their gall bladder out, you know it is a 45-minute operation, you go home two or three hours after the operation, you are not going to improve on that, especially by adding a \$2 million piece of equipment to it. In fact, the 2000, the prospectus made no mention of prostate cancer surgery. As with any technology, you market it to urologists, and they will find a way to use it. But what this really shows is there was a demand for minimally invasive prostate surgery. In 2004, there were 8000 prostatectomies; in 2009, 80% of prostates were taken out robotically.

The current da Vinci system is a three-part system: the surgical cart with robotic arms, the console, and the foot pedals. This console allows us a magnified view and also a 3D view of the operating field. The main benefit of the robot is our ability to get deep inside the pelvis and avoid the fulcrum effect of the pubic bone; the prostate is below the pubic bone. Standard laparoscopic instruments allows a full range of motion: up, down, side-to-side. The robot gives you the motion that your hand has: a fifth degree of motion, which is up, down, side-to-side, and almost a twisting motion or what we call a yaw motion, which is imperative for reconstruction and dissection.

This is what the operating room looks like. The surgical cart is docked at the patient's side, with a surgical assistant here. One of the obvious problems with robotics is the surgeon is not anywhere near the operative field; he is at a console. Here we are operating the arms. The robot does not do anything we don't tell it to do: it is a master-slave system. The robot is simply a tool to help us along. Here are the four foot pedals; the SI machine has more foot pedals than the older system but the same functionality. Every move we make at the console is translated into a move at the bedside.

With robotic prostatectomy, when you look into the abdomen, it looks just like this: here is the rectum, the bladder, and we incise the bladder and bring it down so we can get behind the pubic bone and get to the prostate. Open prostatectomy is so bloody because of this vein right here called the dorsal vein. Pat Walsh figured out ways to control the dorsal vein and the neurovascular bundles; with the robot, we have a much better view of that and we can control that dorsal vein. We take the prostate off the bladder, remove the seminal vesicles and the vas deferens, and you are left with the urethra here and the bladder hole here, and then we reconnect the two in a watertight fashion.

With robotic prostatectomy, this is what your positioning looks like. You are in a split-leg position, so the robot can come in-between your legs, and then we put you in a head-down position. That causes some physiologic problems which is beyond the scope of this talk. Here is the prostate, here is that dorsal vein I was telling you guys about, and you can see how it is bloodless; the first thing you notice is there is no blood. I show this video to show how big that dorsal vein is; we are able to staple that vein, or sew it, now we suture it. So here is prostate, here is the sphincter which holds the urine in, and you can see how nicely this view is in this bloodless field with all this magnification. You get a nice sphincter, which gives us control or continence following the procedure. We are able to cut the prostate out here in a nice controlled bloodless fashion, put it in a bag; we take that bag out near your belly button or your umbilicus, and then we reconstruct the urethra to this bladder hole here. Again, you can see the benefits of the robotic arms; they allow us deep in the pelvis to have full five ranges of motion: up, down, side-to-side, and the yaw motion that is important for reconstruction.

This is nerve-sparing; this is the prostate here. In an athermal fashion, we try to get those neurovascular bundles that lie at the 5:00 and 7:00 positions off of the prostate to preserve erections. You can see here the area of the neurovascular bundles on this side; again, it is a bloodless field so we are able to tease everything away nicely. You will see it nicer on this other side when the prostate gets moved over; here is those bundles right here. We are able to remove the prostate and preserve these neurovascular bundles, which we hope leads to preservation of erections following surgery.

This is what it should look like when we are done, what we call train tracks. We should see the prostate gone, the bladder is here, and there are nice train tracks leading down into the urethra, which are the neurovascular bundles. This is your final product: again, at the midline incision, you get the prostate out, and four or five poke holes in the abdomen. Operatively, it is a bloodless field; at Mayo Clinic, our blood transfusion rate is actually under 0.5%; conversion to open procedure is very low, again, under 0.5%; rectal injury, we have had one in our experience, so that is not really a concern in terms of robotic surgery; and we have had no deaths during surgery.

Quality of life: full incontinence requiring an operative intervention is under 1%. Now, 7% of our guys require insurance pads, meaning they don't leak, but if it is late in the day and they have a couple martinis, they go out to swing a golf club, they may have a few drops of urine, what we call insurance pad usage. Most of those guys are over 70 years old. The older you are, the harder it is for you to regain your continence; the younger, the better. One controversial question is what is the best treatment to preserve long-time erections? Is it surgery? Is it radiation? After surgery, should a patient be doing rehabilitative therapy?

Finally, why should young men have prostatectomy? Your first question should be what is young? Agewise, we consider young to be under 65, but at Mayo in urology, we have biologically elite patients; we have patients that we consider, say an 80-year-old man who does still run marathons, he actually looks better than the 55-year-old guy who we all know. Age to us is not a prohibitive factor in surgery as it is at some places. What is young is subjective, but if you think you are going to live 10-12 years, we consider you young enough to have surgery for prostate cancer.

The three main reasons to have your prostate removed are, number one, if you have a big prostate with significant voiding dysfunction, if you get radiation, cryotherapy, or another type of therapy, the condition will get worse. Removing your prostate will eliminate potential voiding dysfunction. Number two, the one benefit from surgery, especially in higher grade disease, is if the surgery does not work, if cancer recurs, you can always go to radiation; you have a second bullet in the gun to go to with adjuvant or salvage radiation. Third, there is evidence to show that following radiation, 10-12 years out, there is a risk of secondary malignancy: bladder cancer, rectal cancer, and perhaps other types of prostate cancer or modification of your original tumor into something else.

The nondebatable disadvantages of prostatectomy: number one, you will never ejaculate again; you can have sex and have orgasm but you will not have the ejaculate. You may need a blood transfusion, and there is a small risk of surgery. Again, we have never had a death in robotic prostatectomy; nationally, death occurs only in the case of freak accident. There exist inherent risks of surgery.

The advantages of prostatectomy: you get definitive staging. Our microscope can show exactly what you have going on. You are cured if the tumor is pathologically confined; all we have to do is follow your PSA and it should be zero every time you come in. You could treat simultaneous bladder problems. Voiding dysfunction due to a large prostate is removed as soon as the prostate is removed. Prostatectomy allows for the easiest monitoring of any prostate cancer therapy; if your PSA is zero when you come in, and you are doing well, we will see you next in six to nine months. With people who have had other therapies for prostate cancer besides surgery, we do not see the nice clean PSA that is undetectable; this causes a lot of anxiety, PSA anxiety because we do have type A personality guys that will leave and the first thing they start worrying about is ,what is my PSA going to be four months from now, and they can't sleep, can't eat, and that guy, surgery is going to be his treatment. The other therapeutic alternatives are not appropriate for him.