

**DR. BADLANI:** We're going to talk about strictures and incontinence that occur post treatment for prostate cancer. Individually, they are reasonably OK to deal with. And I deal with incontinence, and Ryan deals with the strictures. But when they occur in combination, it becomes a major problem.

Dr. Hemal will show you some very pretty pictures of robotic prostatectomy if you come to the course in February or March. But reality of life is that there is a portion of patients who suffer quality of life issues after treatment for prostate cancer, both with surgery and/or radiation, whether seed implants or external beam radiation. And the two things that we're going to talk about today is continence and stricture.

Post [INAUDIBLE] means strictures can be a complete occlusion or a pinpoint. If you're able to get a wire across, if they are acute, it's easier. If they are delayed or chronic, it's more difficult.

Once you get the wire across, most people just gently dilate. This is probably the most common cause for recurrence of the stricture at the site is inadequate dilatation from the concern that the patient might become incontinent. And that's a discussion you have to have just prior to dilating the patient-- that you may have incontinence after such a procedure.

So once you've dilated-- and that could be in your first algorithm, to dilate-- and/or if it's a chronic you're using some way to incise and stricture. Holmium laser gives you a very good control in a way that you can do it layer by layer and also use a smaller scope. With the incision knife, you may need to use a larger scope.

I don't think it improves results or prevents recurrence. And after this, in a chronic situation, you can elect to inject locally. Differing results-- the Lahey group showed improvement initially with mitomycin. And I think, Brian, you're doing mitomycin as well. Allen Morey's group from UT Southwestern showed no difference in their outcomes with or without injection.

At some point, we were putting UroLume stents in. In terms of stabilizing the stricture, this is a difficult trick to do only because you can't let the UroLume stick into the bladder as calcification will develop over it. And if you leave it just a millimeter or to distal to the stricture, a proximal stricture develops.

Also at that point, short UroLumes were not available as such. For sure the patient would be incontinent. It was a win-win situation for AMS to have UroLume and an AUS, but it required two operations.

So simplifying the algorithm, simple dilatation is usually the first step. I must have something in my hands every day. So after the simple dilatation, you instruct the patient to self dilate. You can do an aggressive DVIU or resection or scar excision.

At each stage, depending on the continent state, you need to stabilize the stricture before you can go on treating the incontinence. You need to wait at least six weeks to three months before initiating treatment. At some point, we were putting the UroLumes. And there are results both from Webster's group and Texas at Baylor that they had combination of UroLume and AUS implants, but at some point, based on the number of treatments that these patients go through, they have to start thinking about urinary diversion.

Similarly with incontinence, the definition of incontinence is very variable. The surgeons who operate for cancer of prostate look at incontinence differently, as opposed to the treating physicians. Early, late, establishing incontinence, generally we wait six months to a year before we initiate treatment unless the person's in a job like a pilot or someone else that needs to return to work and cannot do so if they are still incontinent.

So I have operated, putting in a sphincter four months after a radical prostatectomy in a patient who was a pilot and required control over his continence. And he was wearing six pads a day. It's unlikely that that patient's going to become dry. Yet, in general terms, you wait for approximately a year before you initiate treatment. But I don't have a hard and fast rule on that.

Dr. Hemal has taught me a lot of tricks that can be done during surgery when they're doing the radical prostate. A lot of these are surgeon-dependent and somewhat host-dependent such as the obesity, narrow pelvis, prior TUR-P, et cetera, use of hormones. And then, in terms of doing the technique, how you preserve the bladder neck.

The nerve sparing necessarily works on the erection but there's almost always a combination. Those nerves don't directly affect continence but their correlation appears to be present. There are reconstructive techniques such as the posterior reconstruction or the Rocco stitch, et cetera. Main issue is water tight and anastomosis. Leaking around or blood around the anastomosis generally leads to scarring. And scarring then leads to both incontinence and stricture formation.

At one point, when we're evaluating a series of patients, 67% of patients who presented with incontinence also had a stricture. At one point, I taught continence after radical prostatectomy was a controlled stricture. If it was narrow enough, they were dry. But length of the retained segment is a direct correlate to the continence.

This has been shown both with a laparoscopic procedure-- and this is a picture from Dr. Hemal's case-- and also in an open series that Scardino and Eastham have shown. About 14 millimeter length is what correlates to better continence. If you have eight millimeters or less, incontinence is much more likely. What's the importance of this? As [INAUDIBLE] in New York showed, that if you can measure this pre-operatively, you can do additional measures such as the Rocco stitch, et cetera, to try and improve the continence rate post-operatively.

Treatment for incontinence in a post prostatectomy is fairly standardized. You know bulking agent virtually never used in male incontinence anymore. During the collagen trial, so many years ago, we poured collagen into this, but the scar doesn't allow you to improve the continence. Antegrade injection has been used going through the bladder. That gave slightly better outcome because the mucosa was smoother at that point. But however, you can't sustain that.

So at least in my practice today, with the availability of the sling and the artificial sphincter, bioinjectable is a rare case who has mild incontinence or you want to top it off after a sling. Sling in a person who's two pads or less is the more common procedure. And then, slings came through-- initially the bone anchored slings. This [INAUDIBLE] today replaced by the standard, for us, is AdvVance sling for me. There is a four-arm sling available from Coloplast, the Virtue, that also is available. But my particular favorite at this point is the AdvVance sling.

This is a transobturator technique and a fairly quick procedure. You know the next day if the patient is going to be dry or not. There's no predictable outcome-- the patient-- that you will get better doesn't occur. You're either dry next day, or you're not.

The artificial sphincter has been the gold standard in terms of the treatment. It promises about 95%. It never is 100% because the sphincter is being placed distal to the natural sphincter. And the more further out you go distally, the less is the continence in terms of the placement. And that's why there's a subtle difference between as scrotal placement versus a perineal placement.

If you look at some comparative data that although it's possible to do a double implant through a scrotal approach, the results difference between a perineal and a scrotal approach is the perineal approach is slightly better because you can place the cuff more proximally.

Treatment variables are the presence of radiation. And in fact, the cancer status also matters, but it's not a contraindication for me to operate for continence in a person who either has PSA recurrence and/or has cancer recurrence that's on hormone therapy. That's not a contraindication to treat continence because that status may remain for several years. There's no reason for patients to be incontinent for that length of time.

Distal stricture is an issue that you need to resolve before placing a device or sling. The Association of Radiation limits your options. So if you have a refractory bladder neck contracture, and that is a combination of surgery and radiation, it's much harder to treat than it is of either alone. Typically, post radiation strictures that are without surgery are more distal, closer to the bulb or bulbo membranous urethra. This is also true of seed implants.

But if they've had a TUR, after a seed implant, you have this dystrophic calcification that develops and non-healing that continues to obliterate that prosthetic urethra, then you need to get by and treat, resect repeatedly. And you never get good healing out of that.

If you have a pure post radical prostatectomy stricture, it's obviously more closer to the anastomosis. That is on the left side of the screen. And the extreme is to develop a fistula after a radical prostatectomy. And that's more difficult to treat.

Like I said to you, Tim Boone has published this combined series, which is successful in some patients. This should be only limited to non-radiated patients. Because once you have a radiated patient, that UroLume will calcify for sure. This was experience that I gained in the UroLume early on and learned quickly that never put UroLume in a radiation patient.

So what's the treatment options for these refractory cases? Now there is a dichotomy in the reconstructive group where-- when I mentioned, last month in a conference with Allen Morey and I asked him, where do you cut off and end up going to incontinent diversion? He said, never. That I can always reconstruct except in patients who have combined radiation and surgery.

Whereas others, he's able to reconstruct. I don't have such experience. So for me, the trigger point in diverting or doing a continent augment with mitrofnof is much earlier in patients who have recurrent stricture that is not improving.

So the algorithm in these patients, although you try a vigorous resection, and deep BNI injection with or without steroids or mitomycin, one technique is to place the suprapubic tube. And there are some patients who will stop at that. And they will say, I can live like this.

But if the patients are not-- I mean they are active in life, et cetera, suprapubic is not a great choice. And at that point, you need to allow the stricture to declare itself and see whether you can repair it or not. Or at that point, you go on to moving the urinary diversion. For me, the preference is to do a continent augment or urinary diversion depending on the patient choice. The continent augment and the mitrofnof gives a great choice.

So these are two experts. And you can read the statements. So that alone when radical prostate, it's relatively easier to manage the complication. But once you throw in the nonsurgical treatments which are quote unquote "minimally invasive" which is brachytherapy, or external beam radiation, HIFU, cryotherapy or any combination that occurs, these problems are much harder to deal with and slower return to normal level of function.

Allen Morey, on the other hand, accepts the same fact that the radiation induced strictures a much more obliterative and the shorter strictures do well with their anastomotic experience. But yet, you have to then deal with incontinence. It's rare that after such a reconstructive procedure that the patient will be dry. Although there are reports from both groups that just reconstruction alone was enough for them, in general the reality is that you need something to do with continence.

So what's in the future? Is there feasibility? There are people who've placed graphs on catheters and placed in these areas that have succeeded. But generally, in the bulb of the urethra and not, again, in radiated tissue. Is there any future for cell placement?

Cell placement at least in our place, Dr. Atala's work, has being done in the past using a leg muscle biopsy replacing the sphincter in a dog model, where you take away a portion of the sphincter and then replace it with cells injected. And showing the urethra pressure profilometry that you can reduce the pressure after the sphincterotomy in the upper left side here. And then replace the cells and get the continence zone back again in these patients. So you can see radiographically that you've lost the sphincter. And then we can place it-- the cell injection-- back and gain continence. This has shown that you can survive the cells on a long term basis.

What we're doing today is in a primate model. It's to look at the continence mechanism. Koudy Williams has an R01 one grant in terms of cell injection and gone through the first phase of cell injection to bring continence back. No experience in radiation, et cetera, but in terms of reconstruction, that's what we're looking at.

This is obviously more currently at the female incontinence aspect now than the male incontinence. But these are some of the futures and techniques in terms of developing the continent mechanism. Bottom line is you need tough treatment for tough radiated patients. And generally for me, diversion has worked after multiple treatments have failed.