Editorial

Factors affecting urinary incontinence during robotic radical prostatectomy

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Comment on: Tyson MD 2nd, Ark J, Gregg JR, *et al.* The Null Effect of Bladder Neck Size on Incontinence Outcomes after Radical Prostatectomy. J Urol 2017;198:1404-8.

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In the prospective study recently published by Tyson and colleagues, the authors reviewed 107 patients undergoing robotic assisted radical prostatectomy (RARP) by a single surgeon and demonstrated that there was no relationship between the size of the bladder neck (BN) and the rate of incontinence. This paper is unique in that the actual BN sizes were objectively measured a feature which has not been reported in prior studies. Although the paper does not include the details of the surgical technique in management of the BN, the small sizes of the reported BN suggest that the approach was generally to perform a BN preserving technique. The authors describe a relatively narrow range of BN sizes (interquartile range, 10–16 mm) with a median BN size of 13 mm. They do not report the need for BN reconstruction for any case. In addition, this series is performed by an extremely high volume and skilled robotic surgeon who has honed his technique in thousands of cases (1). Therefore, it is important to note that this study is assessing a homogeneous population of BN sizes with cases performed by a highly skilled surgeon in a reproducible and consistent manner and may not represent the full spectrum of BN size disparity seen in populations of less experienced surgeons.

The importance of preservation of the BN during RARP has been debated in the literature and remains a controversial topic. There is some evidence demonstrating early return of continence with BN preservation (2,3). Preservation of the BN potentially may increase the positive margin rate in patients with high volume disease which remains the major concern behind the improper application of BN preservation techniques (4). It is important to understand that the paper by Tyson and colleagues is not comparing BN preservation to wide resection of the BN, as there is no description of BN reconstruction. Rather, this study compares the amount of BN preservation by evaluating patients undergoing BN preservation who had a very small BN with those that had a slightly larger BN.

The main predictors of continence after RARP can be classified under two general categories. The first category is surgical experience and technique. A recent study by Fossati *et al.* evaluated the effect of surgeon experience on urinary continence outcome after RARP (5). They found a linear relationship between surgeon experience and the likelihood of continence at 1 year after surgery. They observed 60% urinary continence initially which improved to 90% after 400 cases (5). Other groups have determined that 200 or more RARP is the minimum case volume for a surgeon to achieve acceptable and reproducible results for urinary continence (6). In a study by Leroy *et al.*, the authors compared the outcome of the first 30 RARP cases performed by a recent graduate from a robotic surgery fellowship to the first 30 RARP cases performed by experienced open surgeons with greater than 1,000 prior open radical prostatectomies (7). They found that even the initial cases performed by the fellowship trained

surgeon had significantly lower rates of positive margins, anastomotic leakage, prolonged catheterization and need for a second operation. Of note, when they compared the second 30 RARP done by the open surgeons to the initial 30, they found significant improvement in surgical outcomes with the additional volume (7). Taken together, these studies show that surgical volume and mentorship provided by a robotic fellowship program directly translate into improved outcomes, especially in the early phase of practice.

Patient related factors are also known to affect continence rates following RARP. These patient factors include baseline urinary function, bladder stability (8), body mass index (BMI) (9), patient age (10), length of membranous urethra (11), race (12), degree of intravesical prostatic protrusion (13) and a history of prior surgery of the prostate (14). Yamada *et al.* reviewed 272 patients after RARP and on multivariable analysis showed that the presence of an unstable bladder preoperatively was an independent negative predictor for recovery of continence within 12 months after surgery (8). Increased BMI is an established risk factor for post prostatectomy incontinence. The effect of BMI was assessed in a study by Wolin *et al.* where they assessed post radical prostatectomy continence in 589 patients and found obese men (BMI >30 kg/m^2) were more likely to experience incontinence (9). Mao *et al.* found that an advanced age at the time of prostatectomy was a predictor of urinary incontinence when assessing 446 radical prostatectomy patients (15). The length of preserved membranous urethra after radical prostatectomy was also found to be a significant predictor of post-operative continence. Song *et al.* used magnetic resonance imaging (MRI) to assess the length of the membranous urethra after surgery and found that a membranous urethral length ≤14 mm was an independent predictor of incontinence (11). African American race has also been described as an independent predictor of incontinence following RARP possibly due to variations in anatomy with the potential for a deeper and narrower pelvis compared to non-African patients (12).

One important difference between BN sparing and non-sparing techniques is that when the BN is very large there is a need for additional reconstruction. It has been previously shown that BN reconstruction significantly increases the risk of BN contracture, a dreaded complication of RARP (16). BN contracture can increase the risk of overflow incontinence. In addition, treatment of BN contracture may lead to other complications including injury to the urinary sphincter with a subsequent increased risk of urinary incontinence (17).

As the authors described, a limitation of this study is that the size of the BN does not directly correlate with the degree of anatomic preservation of the BN components. For example, some large patients may have a larger BN but still have excellent preservation of the passive continence mechanism of the BN. In contrast, a patient with a preoperatively small BN may end up with a relatively small BN despite resection of important anatomic continence factors. The authors appropriately point out that this study does not suggest that BN preservation does not affect continence status. Rather the authors suggest that there is no need to make the BN overly small in order to improve continence.

This study adds important information to the body of literature to assess the relative degrees of BN preservation and their effects upon continence. The current study demonstrates that there is little difference between a very small BN and one that is slightly larger. Based upon the evidence provided in this study, BN preservation should be implemented in appropriately selected patients. Studies like these are important as we continue to reduce the morbidity of surgical treatment for prostate cancer. Other studies have shown that with appropriate patient selection, there is no higher incidence of positive surgical margins or biochemical recurrence when BN sparing is employed (18). Subsequently, one does not need to make the BN overly small in order to achieve good early continence. It is also important to have reliable prostate biopsy data prior to the surgery to inform the surgeon about the location and volume of the cancer so that the amount of BN preservation can be customized to ensure negative margins while maximizing BN preservation. In attempts for BN preservation, one size does not fit all. We should customize the BN length and thickness based upon the location and volume of the prostate cancer to minimize the morbidity of the operation while also maximizing the continence outcomes.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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