Single Institution 2-Year Patient Reported Validated Sexual Function Outcomes After Nerve Sparing Robot Assisted Radical Prostatectomy

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Purpose: To identify surgeon specific factors for preserving sexual function (and minimize patient related factors) we report 2-year potency outcomes in men 65 years or younger with normal preoperative sexual function undergoing nerve sparing robot assisted laparoscopic radical prostatectomy.

Materials and Methods: Between July 2004 and February 2006, 200 consecutive patients underwent robot assisted laparoscopic radical prostatectomy by 1 surgeon. Inclusion criteria were age 65 years or younger with normal baseline 5-item International Index of Erectile Function score of 22 to 25 and complete 2-year followup. Postoperatively potency was defined by a yes to "erections adequate for vaginal penetration" and "satisfactory erections" on prospective self-administered validated questionnaires with or without phosphodiesterase type 5 medications. Men also reported 5-item International Index of Erectile Function scores and erectile fullness of 0% to 10%, 25%, 50%, 75% or 100% compared to before surgery.

Results: A total of 62 patients met the inclusion criteria, and of these 3 were lost to followup and 1 was excluded from study due to receiving hormonal therapy. At 3 months 32.1% reported potency. At 24 months potency was 89.7% (52 of 58) overall, 93.0% (40 of 43) for bilateral and 80.0% (12 of 15) for unilateral nerve sparing. For potent men the mean 5-item International Index of Erectile Function score was 20.4 at 3 months vs 21.3 at 24 months. Mean erectile firmness at 24 months was 91% compared to preoperative baseline, with 34 of 52 (65%) reporting 100% of preoperative fullness. The 5-item International Index of Erectile Function score and fullness at 24 months were equivalent for unilateral nerve sparing and bilateral nerve sparing.

Conclusions: Overall 90% of men reported return of potency at 24 months, and 46% returned to baseline with normal 5-item International Index of Erectile Function scores and 100% firmness. Remarkably there was no difference in 5-item International Index of Erectile Function scores or fullness between unilateral nerve sparing and bilateral nerve sparing.

Key Words: robotics, prostatectomy, sexual behavior

Abbreviations and Acronyms

BNS = bilateral nerve sparing

CFT = cautery-free technique

EPIC = expanded prostate cancer index

GS = Gleason score

IIEF-5 = 5-item International Index of Erectile Function score

NVB = neurovascular bundle

PDE5 = phosphodiesterase type 5

PSA = prostate specific antigen

RLP = robot assisted laparoscopic radical prostatectomy

UNS = unilateral nerve sparing

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LAPAROSCOPIC radical prostatectomy and robot assisted laparoscopic radical prostatectomy are becoming accepted surgical modalities in the treatment of organ confined prostate cancer. Although the main objective of radical prostatectomy is oncological control, preservation of sexual function has a significant impact in quality life and, when indicated, is an important sec-

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ondary goal. Despite refinement in surgical techniques, sexual function outcomes remain widely variable, with reported rates ranging from 10% to 97%.[1–7] Reasons behind this discrepancy are multifactorial, and may include differences in preoperative patient characteristics such as patient age, baseline erectile function, surgeon experience and technique, and number of nerves preserved.[6–9] In addition, the liberal use of nonstandard sexual function definitions and reporting algorithms contribute further to this variability. Objective data using validated questionnaires on nerve sparing post-prostatectomy sexual function outcomes are sparse in the literature.

In 2005 we described a CFT for dissecting the prostatic pedicle and NVBs in RLP and found this technique to be feasible and reproducible.[10] Subsequent short-term followup results with this new technique were encouraging.[11,12] The focus of this study is to report long-term sexual function outcomes with cautery-free NVB preservation. The intention of selecting healthy men 65 years or younger with normal sexual function was to minimize factors beyond surgeon control that might account for incomplete return of sexual function. Using validated questionnaires we hope to reduce surgeon bias, report objective data and stray away from inconsistent reporting methodology. The primary aim of this study was to provide 2-year potency followup in a consecutive group of men undergoing robotic prostatectomy.

METHODS

Between July 2004 and February 2006, 200 consecutive patients (cases numbers 150 to 350) underwent antegrade RLP, with preservation of the NVB(s) by a single surgeon (TA). From 2002 to 2004, our initial experience, the vascular pedicles were controlled with cautery and this cohort was excluded from study. We have previously described our CFT with bulldog clamps and cold scissors which form the basis of this group.[10] In our initial CFT experience we used hemostatic bioadhesives to control bleeding from the prostatic vascular pedicle after removal of the bulldog clamps. We now rely on suture ligature, as it is precise, familiar and reliable. The results in this study do not include the approximately 25 patients for whom bioadhesives was the primary means of hemostasis. Men with high grade (Gleason scores 4 + 3 to 10) disease in conjunction with obvious palpable disease or multiple involved cores (3 or more on the same side) with 30% or more involvement underwent wide excision of the NVB. All patients with partial or incremental nerve excision were included as bilateral nerve sparing and only those patients with wide excision of the NVB were reported as unilateral nerve sparing.

Patient characteristics including age, height, weight, clinical T stage and Gleason score, PSA, IIEF-5 and pertinent medical history were prospectively entered into an electronic database. Inclusion criteria were age 65 years or younger with normal baseline IIEF-5 of 22 to 25, unilateral or bilateral nerve sparing and complete 2-year followup. Men were excluded from analysis if they used PDE5 inhibitors preoperatively (5), were subsequently placed on androgen deprivation therapy postoperatively (1) or were lost to followup (3). All men were encouraged to take 25 mg sildenafil nightly beginning no later than 1 week after surgery. To our knowledge just 1 patient did not tolerate the medication. Postoperative sexual outcomes were attained prospectively via self-administered questionnaires. Men were considered potent based on an affirmative answers to 2 questions from the EPIC-24, 1) "are your erections adequate for vaginal penetration?" and 2) "are your erections satisfactory?" with or without oral phosphodiesterase inhibitors. Men who achieved erections with alprostadil (injectable or suppository), or by vacuum devices were considered impotent. Erection satisfaction and quality was also evaluated with the IIEF-5 and an estimate of their erectile fullness of 0% to 10%, 25%, 50%, 75% or 100% compared to before surgery.

A nonclinical research associate (DS) collected all followup information. Institutional review board approval has been in place since 2002. All statistical comparisons between the groups were made using 2-sided using Fisher's exact test, the Student t test for means and the nonparametric Wilcoxon rank sum test (SAS® 8.2, GraphPad Prism v5.01).

RESULTS

Clinical and oncological characteristics are shown in table 1. The overall positive surgical margin rate was 10.3% (6 of 58), with no positive margins along the neurovascular bundles. Potency, IIEF-5 and percent of penile fullness at 3 and 24 months are depicted in table 2. We found that an affirmative response to both EPIC questions correlated extremely well with IIEF-5 overall (average 20.4, range 17 to 25). If the response to these questions was yes/no or no/no the average IIEF-5 was 4.0 (range 1 to 12). Of the 6 impotent men at 24 months average IIEF-5 was 2.0 (range 1 to 6) but interestingly all reported some erectile fullness ranging from 25% to 80%, average 55.8%.

As depicted in table 2 on initial followup approximately a third of men were potent with no statistical difference between unilateral or bilateral preservation. Although IIEF-5 scores were similar, initially there was a trend toward greater firmness at 3 months favoring bilateral preservation, which was no longer present at 24 months.

At 24 months, 90% of the men reported being potent. Although there was a trend toward greater potency (80% vs 93% $p = 0.16$) between unilateral and bilateral preservation, there was no difference in quality of erections as ascertained by erectile fullness or IIEF-5. Overall approximately 36 (67%) patients had erectile firmness of 100% and IIEF-5 greater than 20. Equally important is that the re-