Survey of practicing urologists: robotic versus open radical prostatectomy

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Purpose: *The robotic assisted radical prostatectomy (RARP) has become the most common operative choice for localized prostate cancer. At our institution, we have also seen a substantial increase in the proportion of RARP. Possible patient factors may include marketing, increased Internet usage by patients, and patient-to-patient communication. We surveyed urologists from the central United States to determine possible surgeon factors for the popularity of the RARP.*

Materials and methods: *We mailed a survey to all urologists in the South Central Section of the American Urological Association. After demographic information was obtained, participants were asked to choose an operation for themselves based on two prostate cancer scenarios; low risk and high risk.*

Results: *For the low risk prostate cancer scenario, 54.3% chose RARP while 32.9% chose a radical retropubic prostatectomy (RRP). In the high risk scenario, 32.3% chose a RARP while 58.8% chose the RRP. The top reasons for choosing robotics included decreased blood loss, better pain control, and visualization of the apex. The most popular reasons for an open operation included improved lymph node dissection, better tactile sensation, and easier operation for the surgeon. The two most important factors for choosing a particular operation were cancer control and the urologist performing the operation. Also, urologists favored the operative choice in which he or she performed.*

Conclusion: *Robotic assisted radical prostatectomy has become the favored operative approach for low risk prostate cancer. However, many urologists still feel an oncologic difference may exist between open and robotic surgery as evidenced by more urologists favoring an open approach for high risk prostate cancer.*

Key Words: radical prostatectomy, robotics, survey, practice patterns

Introduction

According to the da Vinci prostatectomy website, the robotic assisted radical prostatectomy (RARP) is now the most common operative choice for localized prostate cancer within the United States.[1] This operating platform was first described by Abbou et al in 2001[2] and popularized by Menon et al.[3] Over the last several years, there has been significant controversy in regards to the superiority of surgical methods as well as the cost effectiveness of the multiple techniques for prostatectomy. Regardless of the issues debated, increasing numbers of patients are requesting a robotic approach and increasing numbers of urologists are performing the procedure.

Proponents of the RARP claim that the robot offers decreased hospital stay, less pain, and less blood loss.[4-7] Supporters of the open approach to radical prostatectomy stress the importance of tactile sensation, significant learning curve of the robotic prostatectomy, and the increased cost of robotic prostatectomy.[8] Many have attempted to quantify variables in order to compare the two approaches of surgery but studies thus far are insufficient as there is no way of truly randomizing

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patients to the different approaches. Therefore, many studies use surrogate indicators to make their best evidence decisions about the methods described.

At our institution, we continue to perform radical retropubic prostatectomy, radical perineal prostatectomy, as well as robotic assisted radical prostatectomy. We have also seen a similar trend in our proportions of operations with a significant increase in the number of RARP that we perform. In this study, we attempt to answer the question of whether or not urologists truly feel that there is an advantage to the robotic over the open approach.

Materials and methods

The University of Kansas Medical Center internal review board approval was obtained for the study. A total of 1400 urologists registered in the South Central Section of the American Urological Association (AUA) were mailed questionnaires with an enclosed self-addressed stamped envelope. Baseline demographics such as age, years in practice, type of practice, size of city, number of prostatectomy performed per year, and types of prostatectomy performed were obtained. These surveys were mailed out in June 2008. Results were accepted for the subsequent 3 months.

The responders were given a lower risk patient scenario (Gleason 7 or less, PSA < 10) and a higher risk patient scenario (Gleason 8 or greater, PSA > 20), and asked to chose a surgical procedure if they were the patient. The respondents were given the choices of laparoscopic, perineal, retropubic, or robotic prostatectomy. Individuals were asked to select reasons behind their choices and the most important factor in their decision.

Surveys were compiled for a period of 3 months. Questionnaires with missing data points and those that were completed incorrectly were excluded from our analysis. ANOVA testing was used for interval data that was collected, Spearman rank was used for ordinal variable association, and interval data was converted into nominal and ordinal figures for statistical analysis where chi-squared and T-test studies were performed. GraphPad QuickCalc was used for ANOVA and Spearman rank calculations.

Results

A total of 1400 surveys were sent out and we received 602 (43%) responses. Of which 533 (38%) had complete responses which were used to generate results. Baseline demographics are shown in Table 1.

TABLE 1. **Baseline demographics**

Age		
< 40	97	18.5%
41-50	131	25.0%
51-60	112	21.4%
61-70	120	22.9%
> 70	63	12.0%
Gender		
Male	494	97.1%
Female	15	2.9%
Years in practice		
Resident/Fellow	12	2.3%
< 10 years	124	23.7%
11-20	118	22.6%
21-30	122	23.3%
31-40	98	18.7%
> 40	49	9.4%
Access to robot		
Yes	287	56.7%
No	219	43.3%
Population		
< 50,000	81	15.7%
50,0001-100,000	79	15.3%
100,001-500,000	121	23.4%
500,001-1,000,000	78	15.1%
> 1,000,000	158	30.6%
Number prostatectomies performed		
0	153	30.1%
1-5	56	11.0%
6-15	105	20.6%
16-30	98	19.3%
31-50	51	10.0%
>50	46	9.0%
Types performed		
Laparoscopic	21	4.3%
Perineal	40	8.2%
Retropubic	329	67.4%
Robotic	98	20.1%

For the lower risk prostate cancer scenario, 266 (54.3%) urologists chose a RARP while 161 (32.9%) chose a RRP which was significantly different (p = 0.0001). For the higher risk prostate cancer scenario, 293 (58.8%) urologists chose a RRP while 161 (32.3%) chose a RARP (p = 0.0001). A complete list of the types of procedures chosen for each patient scenario is shown in Table 2.

Age of the urologist was a determining factor for which type of procedure they would choose for the patient scenarios. Urologists 50 years of age or older were more likely to prefer an open prostatectomy in

TABLE 2. **Overall urologist selections**

	Laparoscopic	Perineal	Retropubic	Robotic
Low risk scenario	41 (8.37%)	22 (4.49%)	161 (32.86%)	266 (54.29%)
High risk scenario	16 (3.21%)	28 (5.62%)	293 (58.84%)	161 (32.33%)

both the low and high risk situations. In the low risk scenario, 131/224 (59.4%) chose an open prostatectomy while 103/315 (48.4%) chose an open procedure for the high risk. Urologists younger than 50 years of age were more likely to prefer a RARP in the high risk situation, 103/161 (64.0%).

Urologists who had access to a robot were more likely to prefer a RARP for the low risk scenario 179/287 (62.4%), compared to the no access group which was more likely to choose an open operation 132/217 (60.8%), p = 0.0001. Also, those urologists in academics were more likely to prefer robotic in both the lower and higher risk scenarios. In the high risk patient scenario, there was a significant difference between the academic and private urologists. Those in academics chose robotic 46/59 (78.0%), versus 241/360 (66.9%) of the private practice urologists who chose an open procedure, p = 0.0001.

Urologists that practiced in cities greater than 500,000 were more likely to choose a RARP for the low risk situation 130/216 (60.1%), p = 0.0279, however, there was no difference in the high risk scenario in populations greater than 500,000. In towns less than 500,000, the urologists were more likely to chose open operations for the high risk scenario 180/265 (67.9%), p = 0.0005, while there was no significant difference in the low risk group, Table 3.

TABLE 3. **Breakdown of urologist selections**

		Robotic	Open	p-value
	Age			
Low risk	< 50	124 (57.7%)	91 (42.3%)	0.1991
	> 50	141 (51.8%)	131 (48.2%)	
High risk	< 50	103 (32.6%)	213 (67.4%)	0.4538
	> 50	58 (36.0%)	103 (64.0%)	
	Access to robot			
Low risk	Yes	179 (65.8%)	93 (34.2%)	0.0001
	No	80 (39.0%)	125 (61%)	
High risk	Yes	107 (40.2%)	159 (59.8%)	0.0002
	No	47 (23.6%)	152 (76.4%)	
	Type of practice			
Low risk	Academic	38 (60.3%)	25 (39.7%)	0.2404
	Private	191 (52.3%)	174 (47.7%)	
High risk	Academic	46 (78.0%)	13 (22.0%)	0.0001
	Private	119 (33.1%)	241 (66.9%)	
	Years in practice			
Low risk	< 20	137 (56.8%)	104 (43.2%)	0.0448
	> 20	129 (52.7%)	116 (47.3%)	
High risk	< 20	80 (34.0%)	155 (66.0%)	0.8536
	> 20	81 (33.6%)	160 (66.4%)	
	Population			
Low risk	< 500,000	135 (49.8%)	136 (50.2%)	0.0279
	> 500, 000	130 (60.8%)	86 (39.8%)	
High risk	< 500,000	85 (32.1%)	180 (67.9%)	0.0005
	> 500, 000	75 (49.3%)	77 (50.7%)	

Of the 242 of urologists who had been practicing for less than 20 years, 43.3% chose open and 56.6% chose RARP for the low risk group (p = 0.0001). There was no significant difference in the high risk scenario. Of the 246 urologists who had been practicing for more than 20 years, 66.4% chose open and 33.6% chose a RARP for the high risk group (p = 0.0001).

We found in our survey that urologists were more likely to choose the type of prostatectomy that they, themselves, perform. Those that perform RRP (329) chose this procedure 41% of the time in the low risk patient scenario and 84% in the high risk patient situation (p = 0.0001). Those urologists that perform robotic were more likely to choose to have a robotic approach. RARP was chosen 84% and 57%, respectively for the low and high risk scenarios (p = 0.0001).

Of the 275 separate responses in favor of robotics, the top reasons included decreased blood loss 226/275 (82%), better pain control 201/275 (73%), visualization of the apex 144/275 (52%), visualization of the tissue planes 138/275 (50%), and better continence rates 116/275 (42%). Three hundred thirty-five responders gave reasons in favor of an open prostatectomy which included improved lymph node dissection 201/335 (60%), better tactile sensation 197/335 (58%), and easier operation for the surgeon 131/335 (39%). The two most important factors for their operation of choice were cancer control 304/500 (61%) and the urologist performing the operation 219/500 (44%).

Discussion

Until a well designed randomized controlled trial of all the different operative approaches for prostate cancer is performed, we can never be certain which technique is the best. Many studies have been done to show surrogate data to describe the values of each technique but no firm conclusions have been made to this date. Our goal was not to make a statement about what techniques are better than others in certain situations but rather to get a time dependent statement of how urologists feel about prostate cancer surgery.

Predictably, urologists in larger cities/towns, who had access to a robot, performed robotic prostatectomy, and were involved in academic medicine were more likely to choose a robotic prostatectomy for themselves. The main reasons included decreased blood loss, better pain control, better visualization of the tissue planes and apex, and better continence rates. From the results of our survey, we find that urologists truly believe that there is an indication and advantage to the RARP in low risk prostate cancer.

However, we also found that most urologists would choose an RRP in the high risk patient scenario. This is likely due to there being few definitive studies which show that cancer control is equivalent between the two approaches in high risk prostate cancer. Smith et al did show that in their series, the high risk patients defined as PSA greater than 20 ng/mL, Gleason score 8 or greater, and clinical stage T2C or higher had similar margin positivity rates. The robotic had a rate of 7/13 (53.8%) while the open had a rate of 18/32 (56.3%).[9] Another recent paper from the University of Chicago showed their experience with robotic prostatectomies in Gleason 8 to 10 biopsy patients. Their positive surgical margins were 6% and 42% for T2 and T3 disease, respectively. Furthermore, they found that patients with PSA less than 10 and maximal percentage of cancer in biopsy core less than 30% were more likely to have organ confined disease.[10] This group shows the feasibility of robotics in high risk cancer but does not have a control group to compare their results.

Another reason that many urologists had chosen an open approach for high risk disease was management of the lymph nodes. Although proof of improved oncologic outcomes has not been shown with increased lymph node yield, most would agree that more accurate staging can be achieved with thorough lymphadenectomy. One recent study shows their results with extended pelvic lymphadenectomy with the robot and its feasibility. Feicke et al report their experience on 99 patients with high risk prostate cancer and the robotic extended lymph node dissection. They found that their median yield was 16 lymph nodes. Anatomically, their areas of dissection included the external iliac vein, the obturator lymphatic packet, and the lymphatics overlying the internal iliac artery.[11] Over time, the technique of extended lymph node dissection may be added to the armament of the robotic urologic surgeon to possibly improve outcomes in high risk patients.

In our study, we found that the most important factor in choosing the type of operation was cancer control. Several studies attempt to show the oncologic outcomes of robotic versus open prostatectomy. Most of them do this by using margin positivity rates as a surrogate for cancer control. When the technology of RARP was first introduced, the positive margin rates were approximately 15%-36%.[12-14] More recent data shows vast improvements in margin positivity and some even show lower rates than open series. One large series from Vanderbilt described higher margin positivity in RRP versus RALP. They found a margin positivity of 24.1% and 9.4% for RRP and RARP, respectively, in T2 disease while they report a 50% and 60% positive margin rate, respectively, in

T3 disease. This study also reports that the positive surgical margins were most common at the apex in both groups. This study does acknowledge that there may be some selection bias as the RRP group may have had higher risk features which may have influenced the results. It is also interesting that the apical margin was still the most common between the RARP and RRP group as this is supposedly one potential advantage of the RARP.

Tewari et al describe their margin positive results between the RRP and the RARP. They also report that their RARP patients were less likely to have positive margins with 9% versus the open group which had a rate of 23%.[15] Another study which retrospectively reviewed 98 consecutive RRPs and 94 RARPs found that even after risk-adjustment, the rates of positive margins were similar between the RRP (14%) and RARP (13%) groups. This was true only for the low and intermediate risk population as the high risk patients were taken out of the data analysis. The authors acknowledge this may have been due to a high risk prostate cancer protocol which was going at the same time as well as selection bias as they began their robotic series.

There are several limitations to this study. First of all, it is a non-validated questionnaire which was sent to get a sense of urologists current practice patterns and opinion on robotic surgery. This study is not designed to determine what form of treatment is best. Although we had a very good response rate, a selection bias can always occur with any survey study. In our questionnaire, we did include laparoscopic and perineal prostatectomy as answer choices. Because of the limited number of answers, we excluded them from our data analysis. Finally, we only took into consideration the urologists who were from the South Central Section of the AUA which may have introduced a regional bias.

Conclusion

Robotic prostatectomy has become the urologists' favored operative approach for low risk prostate cancer. Individuals with access to a robot, who practice in a larger city, who were younger, and in academic urology favored a robotic approach. It does appear that urologists feel the robotic approach has surgical benefits. However, many may feel an oncologic difference exists between open and robotic surgery as evidenced by more urologists favoring an open approach for high risk prostate cancer. More studies on the robotic approach to high risk prostate cancer will be welcomed. □

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