Brazilian Journal of Videoendoscopic Surgery

Original Article

Comparison Between Radical Retropubic Prostatectomy versus Laparoscopic Radical Prostatectomy Performed in a Urology Internship Service

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ABSTRACT

Objective: Retrospective comparison of the first cases of radical retropubic prostatectomy versus laparoscopic radical prostatectomy (LRP) performed by the same medical intern in the internship service and depicted the fast adaptation of the new interns to the laparoscopic technique. **Material and Methods**: This study includes an analysis of the first cases of prostate adenocarcinoma submitted to laparoscopy in 2008, and its comparison to the radical retropubic prostatectomy (RRP) performed in 2007 by the same medical intern. The patients submitted to both techniques were selected in order to maintain similarity in the preoperative staging. **Results**: A total of seven patients in each group were selected. In both groups, the first seven surgeries performed were selected to this study. The mean age was 62,4 and 65,1 years for LRP and RRP, respectively. There was only one case with Gleason score of 3+4 among the patients submitted to laparoscopy, and the others were 3+3m with the mean PSA of 6,14 ng/dl. In the RRP cases, there were two cases with Gleason score of 3+4 and the others with 3+3, and mean PSA of 8,9 ng/dl. Mean operative time was 3,4 versus 2,6 hours when comparing LRP and RRP. Bleeding was greater in the open surgery (600ml versus 235 ml); however, transfusion was not necessary. Length of hospital stay after surgery was also greater in RRP (an average of 6 more days of hospitalization). There was only one case of violation of the prostatic capsule and two cases of compromised surgical margins in the laparoscopic technique, while in the conventional technique there was no violation of the prostatic capsule, but in four cases the surgical margins were positive. **Conclusion**: Despite the small number of patients presented in this case series, it is possible to assert that the learning curve is shorter for new interns, which make those procedures more accessible. Previous experience and the supervision of an expert urologist make a lot easier the adaptation and mastery of laparoscopic prostatectomy.

Key words: prostate adenocarcinoma, radical prostatectomy, laparoscopy.

Bras. J. Video-Sur, 2008, v. 1, n. 4: 150-155

Accepted after revision: August, 29, 2008.

INTRODUCTION

In a highly competitive job market in which the medical field is, one of the objectives of medical internship service is to thoroughly prepare the medical interns. In case of urology this adequacy is intimately associated to the development of medicine, in which laparoscopy is one of them.

The treatment of prostate cancer receives special attention due to its prevalence and impact in the target population of the urologist. Since the first report published by Schuessler and cols in 1992 [1], laparoscopy has gained greater acceptance as it was described adaptations to the technique.

However, it has not been discussed a possible difference in the learning curve of the conventional technique and the laparoscopic approach. In Brazil, where general surgery is a requirement for internship in urology, laparoscopy is routinely performed in a great number of urology services. It may be use either for diagnosis or for therapeutic. This allows the future urology intern to be familiarized with the laparoscopic technique, equalizing the learning curve to new techniques to be developed.

Despite the fact that there are not specific randomized studies to evaluate distinct techniques, published studies depicted that the results obtained with LRP are similar or even greater when compared to RRP. When perioperative results are analyzed, operative time is always greater in the laparoscopic technique, even after the ascension of the learning curve and reduction of the operative time, thus it still

will better than the open technique[2,3]. When we analyze aspects of postoperative pain, studies have demonstrated better results with the choice of laparoscopy[4,5], even if this difference is small. When comparing the transoperative blood loss, patients that underwent LRP have less necessity for transfusion as it was reported by Tewari and cols. in 2003, and Ahlering and cols. in 2004. Despite the tendency of earlier hospital discharge in the laparoscopic technique, there is not significant statistical difference between these two techniques.

Regarding functional outcomes, one of the greatest issues is still the urinary continence. Despite the current studies do not allow a definite conclusion about the best technique, there is a precocious return of continence with the use of laparoscopy[6].

Due to a great variety of techniques as well as group of patients, it is difficult to compare the erectile dysfunction after both techniques are performed. The data obtained with LRP technique reach up to 76% after a year of follow-up (bilateral nerve-sparing laparoscopic radical prostatectomy published by Sue and cols. in2004). However, everybody agrees that with a better laparoscopic image resolution associated with less bleeding during dissection allows a better visualization at the moment of bundle dissection.

In spite of the great importance of the data described, perhaps the most relevant datum is the oncologic outcome of the surgery. The physicians that adopt the RRP technique cite that loss of tactile sensation may be a risk of positive surgical margins. However, there was no significant statistical difference when the already published studies are observed[8-11].

Postoperative complications were similar between both groups. Rectal injury occurred in 0,7% of the cases[8,9,12]. When the stenosis of ureterovesical anatomosis and deep venous thrombosis are analyzed, data depict better results for the laparoscopic technique, 0 to 3% versus 3 to 20% and 0,4% versus 2% respectively[8]. It was not reported cases of contamination and metastasis at the trocars sites.

Although it is not a limit factor for developed countries, the perioperative cost is of great importance for countries such as Brazil. Despite the insufficient cost data of our group, due to epidemiologic similarity between the groups studied in Brazil and in the USA, we may interpose the analysis of costs. According to Lotan and cols, and Link and cols in 2004[13,14], the cost of laparoscopic technique is greater than the conventional approach, it may reach more than 120% of the start-up cost. This difference is reduced with the use of reusable material (a routine in Brazilian institutions), short operative time (less than 3,4 hours), and early hospital discharged. However, data such as early return to daily activities, reduced number of complications and blood transfusions should be taken into consideration when the global costs are analyzed.

MATERIALS AND METHODS

Statistical analysis of the data obtained after radical retropubic prostatectomy and extraperitoneal laparoscopy was performed using the Mann-Whitney test and Epi Info 3.32 software.

This study included a retrospective analysis of prostate adenocarcinoma treated with radical retropubic prostatectomy (modified by Walsh), with the data obtained from a case series treated with extraperitoneal laparoscopic radical prostatectomy (adapted by Abbou). All the cases surgery were performed by the same medical resident during the second and third years of training at the medical internship program of the Urology service at Nossa Senhora da Conceição Hospital in Porto Alegre.

The variables evaluated were: operative time, transoperative bleeding, necessity of blood transfusion, postoperative length of hospital stay, and surgical specimen analysis evaluating surgical margins and violation of the surgical capsule.

There was a selection of patients to undergo laparoscopic surgery in order to have similar groups due to age, Gleason score and preoperative prostatic specific antigen (PSA) value. The first seven surgeries performed were used in this study. The first surgical cases of the second year medical internship (radical retropubic prostatectomy) were not selected, thus the first surgeries were performed during 2007.

RESULTS

Until May 2008, after the beginning of the third year of medical internship seven LRP were performed by the same medical intern. The data of the surgeries are reported in table 1 and 2:

The mean age of the patient was 62,4 years old, with a Gleason score of 6(3+3) in almost all the patients. The preoperative PSA value was measured while the patient was in the hospital, and it varied from 0.91 to 13 with an average of 6,14ng/dl. Operative

Table 1

Patient	Technique	Gleason score	Age	PSA (ng/dl)	Operative Time
1	LRP	3+3	63	7,66	5h
2	LRP	3+3	66	0,91	3h
3	LRP	3+4	70	13	4h
4	LRP	3+3	49	4,3	3,5h
5	LRP	3+3	67	4,21	2,75h
6	LRP	3+3	63	5,41	3h
7	LRP	3+3	59	7,53	2,75h

Table 2

Patient	Bleeding(ml)	Transfusion	Capsule	Postoperative Length of Hospital Stay	Positive Margins
1	100	no	intact	4	No
2	250	no	intact	3	No
3	150	no	intact	4	Yes
4	100	no	violated	3	No
5	150	no	intact	4	No
6	750	no	intact	6	Yes
7	150	no	intact	3	No

time varied from 2,75 (165 minutes) to 5 hours (300 minutes) with mean time of 3,4 hours (or 204 minutes).

Bleeding varied from 100 to 750ml, with average of 237ml. Blood transfusion was not necessary. Postoperative length of hospital stay was also analyzed, with an average of 3,8 days. The only case with a greater length of hospital stay (6 days) occurred due to the necessity of changing the Foley catheter during the immediate postoperative (after 24 hours of surgery), as it was pulled by the patient and fell.

According to the anatomopathologic study, when the postoperative oncologic control was analyzed, only in one surgery the prostatic capsule was violated. However, margins were negative. Two cases presented positive margins those involving the periurethral muscular in prostatic apex and Denonvillier's fascia (both cases in T4 stage). A total of 4 patients presented invasion of periprostatic structures (T4), thus in two patients the surgical margins were free of neoplasias.

The first cases of adenocarcinoma treated with RRP during the second year of medical internship (2007) were evaluated retrospectively with the results described in tables 3 and 4.

The age of the patients submitted to RRP varied from 58 to 73 years old, and the mean age was 65,1 years old. The Gleason score remained around 6 (3+3) with only two case with a score of 7. The mean PSA value in the preoperative time was 8,9 ng/dl. Operative time varied from 2,5 hours (150min) to 3 hours (180 min), with an average of 2,6 hours (156min).

Bleeding presented a mean of 607ml varying from 150 to 1000ml. However, blood transfusion was not necessary during the transoperative period. The length of hospital stay was around 8,8 days.

Violation of the prostatic capsule during the surgery was not observed; however, four patients presented positive margins. In all of the patients the invasion was into periprostatic tissues. The other patients presented stages T2 and T3.

When the statistical analysis was performed using the Mann-Whitney test, there was a significant difference in regard to bleeding, length of hospital stay and operative time. There was no difference when it

Table 3

Patient	Tecnique	Gleason Score	Age	PSA (ng/dl)	Operative Time
1	RRP	3+3	62	2,94	2,5h
2	RRP	3+3	64	9,6	2,75h
3	RRP	3+3	58	20	3h
4	RRP	3+3	72	8,84	2h
5	RRP	3+3	73	4,79	3h
6	RRP	3+4	66	7,6	3h
7	RRP	3+4	61	8,97	2,5h

Table 4

Patient	Bleeding(ml)	Transfusion	Capsule	Postoperative Length of Hospital Stay	Positive Margins
1	600	No	intact	5	Yes
2	750	No	intact	8	No
3	1000	No	intact	8	Yes
4	500	No	intact	23	No
5	750	No	intact	9	No
6	500	No	intact	5	No
7	150	No	intact	4	Yes

was evaluated the mean age of the groups, as well as the PSA value and preoperative Gleason score, and rate of positive surgical margins.

The operative time was shorter to RRP technique with mean time of 156 min versus 204 min to LRP (p=0,0491). The time was similar to the one presented in a case series published by Guillonneau and cols in 2002[15]. The difference is that with a low number of surgical cases in our service the average was achieved when compared to other studies previously published.

Transoperative bleeding was significantly lower during laparoscopy (237ml versus 607ml, p=0.0027).

Postoperative length of hospital stay presented better results during LRP when compared to RRP (3,8 versus 8,8 days, p=0.0093).The catheterization time was not statistically significant, with an average of 2 days for laparoscopy and 3,5 days for conventional technique. In spite of that the drains were technically different a ¼ inch Portvac drain was used for LRP and two Penrose drain type 3 for RRP.

Oncologically, there was no difference among the results obtained with the two techniques. Either the invasion of the prostatic capsule or the surgical margins were analyzed. There was injury to the surgical capsule during surgery (at the prostate base) only in one patient submitted to laparoscopy. However, the same patient had margins free of neoplasia. When this item was analyzed, even though the difference was not statistically significant the LRP had positive margins in only two cases, in spite of presenting four patients classified as T4 in the final anatomopathologic study. On the other hand, all the patients classified as T4 had positive margins in the RRP.

DISCUSSION

The importance of the data presented is not associated with the superiority of one technique over the other. Recently published studies, such as Guillonneau and cols. in May 2008 depicted similar oncological results. Erectile dysfunction and urinary incontinence, two of the greatest issues of patients and urologists, are present in both approaches. According to the last edition of Campbell-Walsh, further studies should be accomplished to determine if there are different results, and that these

studies may contribute to other institutions to reproduce them.

What we would like to emphasize is the feasibility of the technique described for the treatment of the same pathology, in this case, the prostate cancer. Even tough all the data regarding the learning curve for the laparoscopic procedure refer to a greater time for adaptation, this study shows that it is not completely true. The laparoscopic technique is part of the urologist routine, considering the basic education of an urologist after two years of general surgery internship and three years of studies in urology. This allows a better qualification to use the laparoscopic technique. Besides the supervision of a physician expert in LRP makes the procedure to become safe and trustful. The results presented here, in spite of a small case series, are similar to recently published studies, which were performed after the evaluation of a great number of patients.

Concerning the results of patients with similar profile in regard to transoperative bleeding (mean of 237 ml) and the length of hospital stay (mean of 3,8 days), even in a initial sample, laparoscopy prove to be safe and to comply with the principle of being a minimally invasive procedure. Comparing the conventional approach which was used with the first surgeries performed by the same intern with the laparoscopic technique the same results were obtained after seven patients underwent surgery. It is important to emphasize that none of the cases submitted to the laparoscopic technique ere converted to open surgery, even when bleeding were greater (750ml).

Farnham and cols. in 2006 observed a greater hematocrit decrease in LRP(38%) when compared to RRP(33%). Thus, Tewari and cols. in 2003, and Ahlering and cols. in 2004 reported less need of blood transfusion in patients submitted to the laparoscopic technique[8]. This study shows a statistically significant reduced bleeding (p=0,0027), even though there is no difference regarding the need of hemotherapy in the postoperative time. This datum may be associated with shorter length of postoperative hospital stay.

According to Salomon and cols. in 2004, Guillonneau and Vallancien in 2000, Bollens and cols. in 2001, and Turk and cols. in 2001, the initial operative time that ranged from 5 to 6 hours decreased to 3 to 4 hours after an average of 20 to 30 patients were submitted to surgery. This time is greater in the open surgery, with a statistically significant difference for RRP even after a learning curve of seven patients submitted to the open technique. The operative time would have been even shorter, if we had more patients to compare, and similar to recent publications. The length of hospital stay, however, is shorter, and it may be associated with less bleeding, shorter period of catheterization and the approach itself. It is less traumatic to the patient, in spite of a greater operative time. We emphasize that the operative time obtained in our case series is similar to case series with a greater number of patients submitted to surgery. Differently of what have been published, this confirms the need of a shorter learning curve for the laparoscopic technique when it is compared to the results obtained from the conventional approach.

The length of hospital stay showed a statistically significant difference for the LRP technique (P=0,0093). However, early hospital discharge would not be an advantage restricted to the laparoscopic technique with data published by Holzbeirelein and Smith in 2000 depicting two days of hospital stay after RRP. Bhayani and cols. as well as Tewari and cols. in 2003 published a case series of hospital discharge on the first postoperative day. Paralytic ileus and intolerance to a regular diet were the main trigger factors. This occurs when the transperitoneal laparoscopic technique is used. In our series all the patients were submitted to the extraperitoneal technique, and it was not observed the presence of ileus or intolerance to a regular diet. Regarding pain and analgesia criteria, there are conflicts among data in the literature; some reports suggest that the results are better in the laparoscopic approach (Menon and cols, in 2002, and Bhayani and cols. in 2003) or that the comparison between the techniques were not statistically significant. It was not the objective of our study to evaluate the criterion of pain; therefore, it was not possible to reach any conclusion.

Again, in regard to the length of hospital stay, the use of catheters may be a factor associated with it. In our small series, in average the catheters were removed after 48 hours in the LRP, while in the RRP only after 84 hours.

When analyzing the oncological results obtained with both techniques, the difference was not statistically significant (p=0,29). Although there was violation of the surgical capsule in one patient during the LRP(none in the RRP),only two other patients had positive margins, those patients were classified as stage T4 in the anatomopathologic study.

A total of four patients were classified as stage T4 in each group of patients. In the laparoscopic technique two patients had positive margins. In RRP, of the four patients in stage T4, all of them had positive margins. These data confirm what have been published, even though the difference was not statistically significant. According to Brown and cols., in 2003, and Khan and Partin, in 2005, there is no difference between both techniques in reach surgical margins free from neoplasia. The absence of sensibility is not a negative factor.

The cost is a limiting factor for the surgical practice in our environment, even though it was not an initial concern of our study. The Ultracision® harmonic scalpel was used to assist dissection in all patients that underwent LRP. Nevertheless, any other disposable material was used. The cost of hospitalization would not be limiting fact for laparoscopy as the length of hospital stay was significantly shorter in our case series.

Comparing to the data reported in the literature, the data obtained in our case series do not have the objective of defining the best technique. However, they allow us to emphasize that the fear of not reaching a satisfactory oncological results with the LRP is not an excuse anymore, as well as the necessity of a larger case series to obtain similar results to the conventional technique

In order to reach the results of our small case series, prior laparoscopic training, theoretical acquisition of the technique, supervision of an expert surgeon and common sense to indicate the surgical approach were essential.

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