Radical Retropubic Prostatectomy on Outpatient Basis

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Abstract: *Introduction*: This study evaluated the possibility of performing in our midst the open radical prostatectomy with discharge on the same day of the procedure, aiming the improvement of postoperative recovery and reduce hospital costs without loss of quality of care, or decreased patient satisfaction with treatment.

Patients and Methods: We selected 27 patients with localized prostate cancer during the period from April 2011 to January 2012, which had a low surgical risk and opted for the open radical prostatectomy. We evaluated the feasibility of outpatient open radical prostatectomy, perioperative complications, and patient satisfaction with treatment.

Results: Eleven (40.7%) patients were discharged on the same day of the procedure; thirteen were discharged in the morning after surgery and three in the second postoperative day. All patients underwent general anesthesia. The use of opioids in safe doses for epidural anesthesia was administered in 13 patients, improving pain control and enabling early discharge in 8 (61.5%) patients. Only 3 (21.4%) patients who did not receive epidural opioid achieved discharge on the same day of surgery ($p = 0.04$). No patient had a major complication or was readmitted to the hospital. There was no difference in patient satisfaction with treatment between the group of the same day surgery and the patients with longer hospitalization.

Conclusion: The open radical prostatectomy can be performed with safety on an outpatient basis, in properly selected patients, with no decrease in patient satisfaction with treatment.

Keywords: Prostate cancer, retropubic prostatectomy, day care, hospital costs, ambulatory surgical procedures.

INTRODUCTION

In Brazil Prostate Cancer (PCa) is currently the most frequent tumor among men, which is the second cause of death due to cancer [1]. In accordance with the Ministry of Health USD 18,203,137.76 were spent by public health system in 2012, with an estimate of 60,180 new cases [1, 2]. These data show that decrease of the length of hospitalization as well as reduction of hospital costs turn out to be imperative.

Improvements in surgical technique and in postoperative care, carried out on patients underwent Open Radical Prostatectomy (ORP), have reduced dramatically the length of hospitalization. Implementation of a set of measures, like adequate guidance to patients and families, stimulus to early ambulation, reintroduction of diet as soon as possible and epidural analgesia are capable of accelerating the recovery period, decreasing hospitalization costs, without changing patient satisfaction with the treatment [3-7].

At the end of the 90s, Kehlet introduced in general surgery, multimodal rehabilitation principles, called "*Fast-track concepts*" [8, 9] with the objective of reducing postoperative physiological and psychological stress, with consequent improvement of the recovery process. Fast-track rehabilitation is based on the principles of adequate prehospital guidance, use of less invasive surgical techniques, effective analgesia, without high doses of opioids, and early ambulation and reintroduction of foods. The application of these measures in patients underwent to Laparoscopic Radical Prostatectomy (LRP) showed, aside from important reduction in length of hospitalization, decrease of pain scores and rates of complications, with resultant satisfaction with the treatment [10, 11].

The use of ORP, conducted in a standardized approach, presents low morbidity [12], which has benefits like the use of retroperitoneal access and shorter length of surgery, allowing an early recovery to patients, similar to what is achieved with minimally invasive techniques, however at a sufficiently reduced cost [13, 14]. The objective of this study is the execution of ORP in a tertiary teaching hospital with proposed hospital discharge on the same day of the procedure.

PATIENTS AND METHODS

Twenty seven patients with prostate cancer (PSA < 20 and no evidence of metastasis) attended at our institution were selected, who opted for Open Radical Prostatectomy on an Outpatient basis (OORP) as form

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of treatment, during the period from April 2011 to January 2012. The inclusion criteria were: under 70 years of age, 100% performance status index, ASA (American Anesthesiology Association) score I or II, absence of diabetes mellitus or other cardiovascular, respiratory or neurological co-morbidities that contraindicate the outpatient procedure. Patients with history of prior treatment for prostate cancer or with social limitations, such as non-possession of an automobile or telephone, distance of over 50 km between the patient's home and the hospital, or absence of companion were excluded. The patients were properly informed about the proposed discharge on the same day of the procedure and underwent a series of measures to accelerate postoperative recovery.

Prehospital Guidance

Patients selected for OORP on the same day of the surgery received all necessary orientations through collective meetings (with physician, and nurse and psychologist) followed by submission of orientation protocol about ORP and regarding details of the outpatient program. Data concerning the surgical technique, equipment used and information about the anesthetic procedure and the stages experienced at the hospital during immediate postoperative period.

Postoperative Care, Surgical Technique and Anesthetic Procedure

The patients were admitted one day prior to the surgery at 6 p.m. and received an application of enema through rectal route for intestinal preparation associated to a residue-free liquid oral diet. Fasting started at 10 p.m. on the day prior to surgery, where the patients were then sent to the operating room at 7 a.m. All received epidural anesthesia (Bupivacaine, Ropivacaine or Lidocaine compounds, combined or not with Fentanyl or Sufentanil, at the anesthesiologist's discretion) followed by general anesthesia with propofol, atracurium, remifentanil and isoflurane. During the transoperative phase, patients receive the following drugs: intravenous (IV) Ketorolac 30 mg, Dipyrone 2g IV and Ondansetrone 4 mg IV. The patients were underwent to radical retropubic prostatectomy through the surgical technique presents previously [12].

Postoperative Care

The patients in the anesthetic recovery room, who were underwent to epidural anesthesia, received intravenous dose of 2 mg of Morphine, when the patient had persistent pain. All patients received 10 mg of Oxycodone orally in postoperative recovery room. During the postoperative period at the ward, the patients received for analgesia 1 g of Dipyrone every 6 hours, with rescue dose of 100 mg of Tramadol and/or 100 mg of Ketoprofen, in case of persistence of pain. At about 1:30 p.m. the first meal was offered, composed of a light diet (water, juice, soup, and gelatin). At 3 p.m. the patients received a visit from the urologist, when physical examination was performed and stimulus to ambulation was started. Change of dressing was performed at 6 p.m., followed by offering of a snack (water, juice, tea, biscuits). At 7:30 p.m. the patient received again a visit from the urologist who assessed whether the patient manifested criteria for hospital discharge:

- Urinary output of 0.5 – 1 mg/kg/h for at least four hours;
- Hemodynamic stability, defined by Pulse Rate and Blood Pressure within a range of up to 20% difference from the preoperative values;
- Oxygen saturation in ambient air comparable with that of preoperative value;
- Good acceptance to diet and liquids orally such that use of venous hydration could be removed;
- Capacity to walk alone with no episodes of vertigo or postural hypotension;
- Low Port-vac drainage output (lower than 200 ml of total postoperative drainage);
- Hematocrit above 30% (collected at 6 p.m.);
- Pain controlled with oral drug alone;

In the presence of all criteria for a safe hospital discharge, this possibility was offered to the patients, who also could choose to continue hospitalized for a longer period of time. The drug for use at home was composed of a single dose of Oxycodone (10 mg) to be taken at 8 a.m. on the first postoperative day, combined with Dipyrone (500 mg) four times a day for three days and rescue doses of Tramadol (100 mg), in case of persistence of pain. Prophylactic antibiotic treatment with Norfloxacin (400 mg every 12 hours) was also prescribed, while the patient continued with Foley catheter. On the day after the surgery at 10 a.m., the patients who were discharged on the day of the

surgery were contacted by telephone by the urologist, in case they had any doubts to clarify. Aside from this, the degree of pain (intensity scale from 0 – 10), acceptance to diet and presence of nauseas and/or vomiting were asked. On the second postoperative day the patients of the group with discharge on the same day of the surgery returned to the urology clinic for withdrawal of the drain and medical reassessment. The abdominal drain was removed prior to hospital discharge in patients who stayed longer than one night, except in a case of persistent output. On the fourteenth postoperative day all patients returned to the outpatient clinic for removal of Foley catheter.

Statistical Analysis

Comparisons between groups of continuous variables were performed using Student's t test for normally distributed variables or the Mann-Whitney test for variables with non-normal distribution considered, and the chi-square or Fisher exact test for categorical variables. All tests used the p value <0.05 for statistical significance. The software used was SPSS 11.0 for Windows.

RESULTS

ORP on the basis of discharge on the same day of the surgery was proposed to 27 selected patients. Seven patients presented intraoperative hypotension and were excluded from the protocol of same day discharge. Of the 20 patients who presented satisfactory progress, 11 obtained discharge on the same day of the procedure and 9 continued hospitalized for 24 to 48 hours. Six patients stayed hospitalized due to postural hypotension, two because required parenteral analgesia and one patient under discharge conditions opted to remain hospitalized for feeling safer sleeping at the hospital. The postoperative clinical and pathological aspects, aside from the surgical aspects of both groups are described in Table **1**.

Table 1: Clinical and Pathological Aspects and Postoperative Data

	Group 1 Discharge on the same day of the surgery (n = 11)	Group 2 Length of conventional hospitalization (n = 16)	p Value
Prostatic Volume (grams)	34.5 (20-50)	38.1 (20-60)	0.458*
Biopsy Gleason Score			
6	8 (72.7%)	13 (81.3%)	0.364**
7	3 (27.3%)	2 (12.5%)	
8	0 (0.0%)	1 (6.3%)	
Stricken fragments (%)			
Mean	29.2 (7.7-75.0)	39.8 (8.3-83.3)	0.384*
Local clinical staging (T)			
T1c	8 (72.7%)	10 (62.5%)	0.662**
T2a	3 (27.3%)	5 (31.3%)	
T2b	0 (0.0%)	0 (0.0%)	
T3	0 (0.0%)	1 (6.3%)	
Length of surgery (min)			
Mean	119.5	120.9	0.866*
Median	120.0	120.0	
Standard Deviation	22.0	20.0	
Estimated blood loss (ml)			
Mean	636	841	0.130*
Median	680	680	
Standard Deviation	198	402	
Hb (g/dl) / Ht (%) Drop			
Mean	2.02	2.89	0.113*
Median	1.70	3.30	
Standard Deviation	1.39	1.17	
Transfusion	(0.0%)	1(6.3%)	1.0***

*t-Student test; **chi-square test; ***Fisher's Exact Test.

Table 2: Total Number of Patients Underwent to Epidural Anesthesia with and without Opioids

	Only Local Anesthetics (Bupivacaine/Rupivacaine) n (%)	Local Anesthetics and Opioids (Fentanyl/Sufentanil) n (%)
Discharges on the same day	3 (21.4)	8 (61.5)
Discharges on the 1st PO day	9 (64.3)	3 (23)
Discharges on the 2nd PO day	2 (14.3)	2 (15.5)

Obturator lymph node dissection was performed in 16 patients who presented some risk factor for lymphatic dissemination (Gleason > 6, and/or over 50% of the number of tumor-stricken biopsied fragments and/or PSA > 10), where this procedure was conducted in six (54.5%) patients of the group that was discharged on the same day (Group 1) of the surgery and in ten (62.5%) patients of the group that continued hospitalized for a longer period of time (Group 2). Aside from this, two patients of the group with discharge on the same day of the surgery were underwent to an associated procedure (a hydrocelectomy and a unilateral inguinal hernioplasty) and a patient who stayed hospitalized for one night was underwent to inguinal and umbilical hernioplasty, combined with ORP.

The presence of an opioid (fentanyl or sulfentanil) in epidural block showed to be of great importance, since it improved control of pain in 13 patients on whom this drug was administered, allowing discharge on the same day of the surgery in 8 (61.5%) patients. Only 3 (21.4%) who did not receive epidural opioid obtained discharge on the same day of the surgery (Table **2**) Thus the use of epidural opioid increased in about six times the chances of discharge on the same day of the surgery in relation to patients in whom this drug was not administered (Odds Ratio 5.88 Confidence interval 1.07- 32.3).

Low doses of Morphine (maximum of 4 mg) were used for pain breakthrough during OPR in three patients who were discharged on the same day of the surgery and three others who needed dose of Tramadol at the ward. The use of opioid at low doses did not hinder the execution of earlier hospital discharge. The drugs used for control of pain are presented in Table **3**.

There was no serious complication during the follow-up period up to one year after the surgery. One patient presented urinary fistula, with good progress after conservative treatment, allowing the withdrawal of the drain on the 5th postoperative day; this same patient also presented edema of the penis with spontaneous resolution. Only one patient from the outpatient discharge group presented problems with Foley catheter due to frequent obstructions caused by small clots, which were solved after manual washing. No patient was readmitted at the hospital. As late complications we had a patient who presented urethral stenosis and another with chronic thigh pain (Table **4**).

Table 3: Drugs Used for Control of Pain

	Group 1 Discharge on the same day of the surgery (*n* = 11)	Group 2 Length of conventional hospitalization (*n* = 16)	*p* Value*
Epidural anesthesia			
With opioid	8	5	0.034*
Without opioid	3	11	
Epidural rescue analgesia	1	3	0.488*
Rescue EV opioid			
Morphine (2mg)	3	5	1.000*
Tramadol (100mg)	2	4	1.000*
Mean pain score 1st PO (0-10)	4.4 (1.8)	5.4 (2.0)	0.251**

*Fisher's Exact Test; **Mann-Whitney's Test.

Table 4: Classification of Complications According to Clavien

Clavien's Classification	Group 1 Discharge on the same day of surgery (*n* = 11)	Group 2 Length of conventional hospitalization (*n* = 16)	p Value*
I			
Urinary:			
Urinary fistula	0	1	1.0*
Catheter obstructions	1	0	0.43*
Hematuria	1	0	0.43*
Penile hematoma	1	1	1.0*
Urethral stenosis	0	1	1.0*
Renal			
Elevation of nitrogenous substances	1	0	0.43*
Intestinal			
Abdominal distension	1	0	0.43*
Anal fissure	0	1	1.0*
Others			
Thigh pain	1	0	0.433*
Pruritus (allergic reaction)	0	1	0.43*
II			
Urinárias:			
ITU	1	0	0.43*
Outras:			
Transfusão	0	1	1.0
III-V	0	0	1.0*
Total	7	6	0.18**

*Fisher's exact test; **Test Qui-quadrado.

Both groups showed to be similar in postoperative staging and, also in the assessment of continence and potency rates (Table **5**).

DISCUSSION

This study shows that RRP on an outpatient basis is possible in selected patients, with low probability of

Table 5: Pathological Stage, Follow-Up and Functional Aspects

	Group 1 Discharge on the same day of the surgery (*n* = 11)	Group 2 Length of conventional hospitalization (*n* = 16)	p Value*
Pathological staging			
pT2a	0 (0.0%)	3 (18.8%)	0.335
pT2b	1 (9.1%)	0 (0.0%)	
pT2c	8 (72.7%)	8 (50.0%)	
pT3a	1 (9.1%)	2 (12.5%)	
pT3b	1 (9.1%)	3 (18.8%)	
Gleason Score			
6	2 (18.2%)	4 (25.0%)	0.450
7	8 (72.7%)	12 (75.0%)	
8	1 (9.1%)	0 (0.0%)	
Biochemical Recurrence			
Yes	2	1	0.332
Adjuvant Therapy			
Radiotherapy	2	3	0.970
Hormone therapy	1	2	0.782
Continence 18m (0 pads/day)	10 (90.9%)	11 (68.75%)	0.174
Potency (SHIM >21)**	2/4 (50%)	2/7 (28.5. 5%)	0.477

*Chi-square test; **Patients with erectile dysfunction prior to surgery were excluded.

postoperative clinical complications, when the surgery is performed in sites with large volume, as long as all necessary aspects are observed for an optimized postoperative recovery, such as adequate prehospital guidance, selective use of opioids, early reintroduction of diet and stimulus to ambulation.

Intraoperative bleeding is certainly one of the most important aspects for maintenance of hemodynamic stability and possibility of earlier hospital discharge. Previously published series of cases of patients underwent to RRP showed an estimated blood loss that varies between 563 and 1575 ml, such that transfusion rate oscillated between 10.5 and 31.4% [16-18]. In our study blood loss was 636 ml in group 1 and 841 ml in group 2, such that only one patient required transfusion. The execution of RRP with standardized surgical technique [12] allows reduction of length of operation to values lower than 120 min, as obtained in this series of cases, contributing to lower morbidity and faster postoperative recovery.

The pioneering study conducted by Hajjar *et al*. [19] showed to be possible the execution of RRP on an outpatient basis with the use of intraoperative pelvic block, combined with improvements in postoperative cares. This technique was used in 15 patients, such that ten achieved the goal of discharge on the same day of the surgery. In our study epidural block was used in combination with general anesthesia, since it is the most diffused technique among anesthesiologists and of proven efficacy. The selective use of opioids in the block showed to be an important factor for better recovery and decrease of length of hospitalization.

The use of robotic surgery on an outpatient basis, conducted by Martin *et al*. [21], on 11 patients showing that the rates of satisfaction, assessed through validated questionnaires, were not affected by the decrease of length of hospitalization. However the long learning curve and higher costs of these techniques cripples its full diffusion in developing countries like Brazil. A study published in 2010 by Saito *et al*. [12] showed that the learning curve for the execution of RRP was only on 29 cases, in a reference uro-oncology training center, where the mean length of operation was 140 minutes and the indexes of blood transfusions and postoperative complications were low.

The Brazilian public health system currently pays the total value of USD 497.58 to hospitals that perform RRP [22], considering the mean length of hospitalization of six days. Tomaszewski *et al*. [23] reported that the mean cost of operation for LRP (USD 2852 ± USD 528) was seven times higher than RRP (USD 417 ± USD 59) in a North American hospital. This study proposal confirms that we can conduct radical prostatectomy on an outpatient basis contributing to reduction of expenses.

As we have emphasized the limitations of our pilot study that was small sample to allow for the purpose of safety monitoring of all patients. A randomized or blinded study could be performed with two groups or a study comparing the laparoscopic or robotic radical prostatectomy. However in our country, this modern technology is not available in almost all public hospital. We have considered that the extra-peritoneal open radical prostatectomy could be best choice as minimally invasive surgery as shown the results this study.

This study is unprecedented in our country and this innovative feature allows the opening of new perspectives in the discussion on postoperative cares of patients underwent extra-peritoneal open radical prostatectomy, with reduction of hospital costs. This is relevant because it can be applies in other oncologic centers. Aside from this, we can make extra-peritoneal RRP comparable with laparoscopic techniques, commonly called as minimally invasive surgeries, in what refers to low morbidity, decrease of postoperative pain and quick return to regular activities.

Moreover, stimulating and disseminating ORP to other medical-hospital centers, turning costs lower for the public system, without risks to the patients. This study also enabled 80% of patients received hospital discharge on the first postoperative day. This concept can be evaluated in countries whose ORP is imperative, because they have no other alternatives, for example the robotic surgery.

CONCLUSION

Open radical retropubic prostatectomy, accompanied by a set of measures that optimize postoperative recovery, can be conducted in selected patients a discharge in same day of surgery.

AUTHOR DISCLOSURE STATEMENT

The authors declare no conflict of interest. No competing financial interests exist.

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