Laparoscopic radical prostatectomy: experience of 115 cases over a 2-year period

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ABSTRACT

Objective: To analyze laparoscopic radical prostatectomy (LRP) results obtained over the last two years.

Materials and methods: Case records of patients diagnosed with prostate cancer (CaP) who consecutively underwent LRP from August 1, 2006 to July 31, 2008 (n=115) were reviewed. Mean age, clinical tumor stage (TNM), prostate specific antigen (PSA), Gleason score (pre- and postoperative), surgery duration, bleeding, hospitalization duration, morbidity, mortality, urinary continence and postoperative sexual potency were all evaluated.

Results: A total of 115 case records were reviewed. Patient age was from 48 to 78 years with a mean age of 62 years and standard deviation (SD) of ± 6.9 and the most frequent age was 60 years. Morbidity was 8.6% and mortality was 0.8%. Clinical stage varied from T1a to T3b. One hundred patients presented with PSA < 20 ng/ml, with a mean 8.6 and SD ± 3.2. The remaining 15 patients underwent pelvic lymphadenectomy. Preoperative Gleason score was in a range of 3 to 7, with a mode of 7, and the 3+4 score was predominant (23% patients). A total of 24 intrafascial surgeries and 91 extraperitoneal surgeries were performed (42

RESUMEN

Objetivo: Analizar los resultados de las prostatectomías radicales laparoscópicas (PRL) realizadas en los dos últimos años.

Material y métodos: Se llevó a cabo la revisión de los expedientes clínicos de los pacientes con diagnóstico de cáncer de próstata sometidos a PRL en forma consecutiva entre el 1 de agosto de 2006 y el 31 de julio de 2008 (n = 115). Se evaluó la edad promedio, la etapa clínica (TNM), el antígeno prostático específico (APE), la suma de Gleason (pre y postoperatorio), el tiempo quirúrgico, sangrado, la estancia hospitalaria, morbilidad, mortalidad, la continencia urinaria y la potencia sexual postoperatoria.

Resultados: Se revisaron un total de 115 expedientes clínicos de pacientes cuya edad osciló entre 48 y 78 años, con una media de 62 y una desviación estándar (DS) de ± 6.9; la edad más frecuente fue de 60 años. La morbilidad fue reportada en 8.6% y la mortalidad en 0.8%. Las etapas clínicas variaron de la T1a a la T3b. Un APE menor de 20 ng/ml estuvo presente en 100 pacientes de la presente serie, con media de 8.6 y DS ± 3.2; los restantes 15 pacientes fueron sometidos a linfadenectomía pélvica; la suma de Gleason preoperatorio se encontró en un rango de 3 a 7, moda de 7 y predominio de la suma de...
nerve-sparing and 73 non-nerve-sparing procedures). Thirty-nine patients underwent urethropexy and 29 underwent lymphadenectomy. Mean surgery duration was 164 minutes (90 to 420 min range and SD ± 50 min). Mean intraoperative bleeding was 384 ml (100-1800 ml range and SD ± 276 ml) and mean hospitalization duration was 3.3 days (1 to 12 day range and SD ± 1.3). There were no conversions to open surgery. Urinary continence at 8, 30, and 90 days presented in 42.9%, 82.4% and 97.3% of patients, respectively. There was absence of erection in 18 patients prior to surgery and of the remaining 97 patients, 31 (31.6%) presented with absence of erection after surgery.

**Oncological Results:** Four patients presented with positive margins (3.5%) and mean PSA at 3 and 6 months was 0.058 and 0.08 ng/ml, respectively.

**Conclusions:** The results of this series are similar to those published by other authors. Reduced procedure morbidity, low complication rate and excellent oncological and function-preserving results make LRP an ideal treatment for CaP.

**Key words:** prostate cancer, prostatectomy, laparoscopy

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**INTRODUCTION**

Prostate cancer (CaP) is the second cause of death from malignant tumor in individuals above 50 years of age. There were 2,536 registered deaths from CaP in Mexico in 2003, making it and skin cancer the most frequent tumors in the male population. Prostate cancer is less frequent in individuals under the age of forty and its incidence progressively increases after this age and reaches its maximum peak around sixty years of age. The registered mortality rate for 2003 was 9.9 cases per 100,000 inhabitants (1).

Life expectancy and opportune detection awareness have increased due to demographic changes and many cases are presently detected in their early stages and during the individual’s productive years. Important biomedical and pharmacotherapeutic advances have made therapeutic alternatives such as cryotherapy, High Intensity Focused Ultrasound (HIFU), conformational radiotherapy, brachytherapy, expectant management and the gold standard of radical surgery in its different modalities available to the urologist and his or her patients. The decision of which available treatment is best applied to which patient lies with the urologist, who must constantly receive information and training in order to make the best possible decisions. The physician must keep abreast of the current medical articles concerning procedures of interest and preferably receive training in specialized centers.

Even though radical retropubic prostatectomy (RRP) has been the most commonly performed procedure for resolving localized CaP, the introduction of laparoscopy and robot-assisted laparoscopic radical prostatectomy (RALRP) has changed surgical management expectations (2). Through a reduction in surgery and hospitalization durations and low
transfusion rate both LRP and RALRP have gained ground over RRP (3).

Schuessler and cols., were the first to describe LRP, (4) while Guillonneau and Vallancien were the first to objectively show its advantages over conventional techniques and concluded that LRP could be performed safely and efficiently within a reasonable surgical time frame. Without a doubt, laparoscopic surgery holds an important place in CaP surgical treatment in Europe. This is largely due to the efforts of the Montsouris Clinic that published its initial experience with LRP in which surgery duration was significantly reduced by 4-5 hours. Postoperative urinary continence (72-84%) and erection (45%) rates were also improved (5). This technique has been criticized because of its prolonged learning curve, which has perhaps been overcome with the appearance of robotic surgery (6).

In 2004 Lotan and cols. concluded that even though RRP is less costly, LRP has become economically competitive. This however, cannot be said of RALRP (7).

The objective of the present article was to evaluate LRP results of the last two years that were performed at the Instituto de Cirugía robótica y de mínima invasión en Urología.

### MATERIALS AND METHODS

The case records of patients diagnosed with clinically localized CaP (T1a, T1b, T1c, T2a, T2b) and with locoregional disease (T3b) who underwent LRP in our Institute from August 1, 2006 to July 31, 2008 were reviewed.

<table>
<thead>
<tr>
<th>Clinical Stage</th>
<th>Preoperative N (%)</th>
<th>Postoperative N (%)</th>
</tr>
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<tbody>
<tr>
<td>T1a</td>
<td>1 (0.86)</td>
<td>1 (0.86)</td>
</tr>
<tr>
<td>T1b</td>
<td>3 (2.60)</td>
<td>3 (2.60)</td>
</tr>
<tr>
<td>T1c</td>
<td>85 (73.9)</td>
<td>84 (73.0)</td>
</tr>
<tr>
<td>T2a</td>
<td>17 (14.7)</td>
<td>15 (13.0)</td>
</tr>
<tr>
<td>T2b</td>
<td>8 (6.95)</td>
<td>8 (6.95)</td>
</tr>
<tr>
<td>T3a</td>
<td>0 (0)</td>
<td>1 (0.86)</td>
</tr>
<tr>
<td>T3b</td>
<td>1 (0.86)</td>
<td>2 (1.74)</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>114*</td>
</tr>
</tbody>
</table>

*Absence of histopathological report due to death

<table>
<thead>
<tr>
<th>Mean AGE (±SD)</th>
<th>61.5 +/- 6.91</th>
</tr>
</thead>
<tbody>
<tr>
<td>APE</td>
<td>N (%)</td>
</tr>
<tr>
<td>&lt; 20</td>
<td>100 (87%)</td>
</tr>
<tr>
<td>≥ 20</td>
<td>15 (13%)*</td>
</tr>
<tr>
<td>Total</td>
<td>115 (100)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PSA &lt;20 mean (±SD)</th>
<th>8.6 ± 3.2</th>
</tr>
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<tbody>
<tr>
<td>Gleason</td>
<td>Preop n (%)</td>
</tr>
<tr>
<td>&lt;6</td>
<td>16 (13.9)</td>
</tr>
<tr>
<td>6</td>
<td>40 (34.7)</td>
</tr>
<tr>
<td>7</td>
<td>43 (37.3)</td>
</tr>
<tr>
<td>8</td>
<td>8 (6.9)</td>
</tr>
<tr>
<td>9</td>
<td>8 (6.9)</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
</tr>
</tbody>
</table>

*Patients with pelvic lymphadenectomy. ** Student t-test.

All patients were operated on by the same surgical team and the variables of age, clinical stage, prostate specific antigen (PSA) and pre- and postoperative Gleason scores were evaluated along with surgery duration, bleeding, surgical technique employed, morbidity, mortality, hospitalization duration, length of time patient was transurethrally catheterized and mid-term functional and oncological results.

Data was analyzed using descriptive statistics with measures of central tendency and dispersion. Series results published by other international researchers were also mentioned.

Sexual potency and urinary continence were evaluated with previously validated questionnaires (The International Index of Erectile Function (IIEF) and The International Continence Society (ICS) ICSmale questionnaires) (8,9).

## RESULTS

A total of 115 patients were operated on. Their ages ranged from 48 to 78 years with a mean age of 61.5 years, standard deviation (SD) ± 6.91. The most frequent age was 60 years. Six of the 115 patients had had a previous transurethral resection of the prostate (TURP) to treat hyperplasia.

Twenty-four (20.9%) intrafascial procedures and 91 (79.1%) extrafascial procedures were employed and 42 (36.5%) of the surgical techniques were nerve-sparing procedures.
Clinical stage radical surgery indication according to TNM classification was between T1a and T3b and the most frequent stage was T1c. (Table 1).

When PSA was suspicious of malignancy the patient underwent transrectal biopsy to absolutely determine the presence of CaP. PSA < 20 ng/ml presented in 100 patients with a mean 8.6 and SD ± 3.2. The remaining 15 patients underwent pelvic lymphadenectomy with only one pathology report positive for malignancy (Table 2).

Preoperative transrectal biopsy was carried out with a minimum of 6 samples and Gleason score ranged from 3 to 9 with a mode of 7. The most frequent sum was 3+4 in 23% of the patients. Pre- and postoperative scores were compared using the Student t test and no statistical significance was found (Table 2).

A bone scintiscan was done on all patients (n= 43) presenting with a PSA >10 ng/ml, all of which were negative for metastasis.

Mean surgery time was 164 minutes with a range from 90 to 420 min and SD ± 50. Mean intraoperative bleeding was 384 ml, SD ± 276. Mean hospitalization duration was 3.3 days, SD ± 1.3. Mean transurethral catheter removal was 8.3 days (Table 3).

Complications presented in 8.6% of patients which included 2 rectal lesions and 2 cases of total urinary incontinency. The former were managed with rectal wall repair using polyglactin 910 running sutures. One of the patients developed rectal fistula that was repaired 3 months later.

Total urinary incontinence was managed in both patients with artificial sphincter placement. There was also one death secondary to pulmonary thromboembolism (Table 4).

During patient control before and after surgery, erection quality was evaluated with a previously validated questionnaire (IIEF). (9) Patients were considered potent if erection was rigid enough to achieve penetration (n=97) and therefore were able to be evaluated in relation to postoperative sexual potency (Table 5).

A closed suction drain was placed in all patients and monitored every 8 hours. It was removed when output was ≤ 20 ml/tourn. Once the drain was removed, urethral catheterization was suspended on day 7 and urinary continence was evaluated.

Forty-nine patients (42.9%) achieved urinary continence upon Foley catheter removal. Ninety-four patients (82.4%) achieved continence at 30 days and 111 patients (97.3%) at 3 months. Only 2 patients presented with total urinary incontinence (CaP with extraprostatic locoregional growth and adjuvant treatment with radiotherapy and androgen blockade). Their incontinence was corrected with artificial sphincter placement. The evaluation of one additional patient is still pending (Table 6).

**Oncological results.** Pelvic lymphadenectomy was indicated in patients presenting with PSA ≥ 20 ng/ml and was performed in 29 patients (25.2%). Only one of the patients presented with malignancy. Postoperative histopathological study positive margin index was 3.5% (n=4).

**DISCUSSION**

Schuessler and Vancaillien were the first to describe pelvic lymphadenectomy in 1991 (4) and together with
Clayman described the first successful LRP in 1994 (10). However, due to surgery duration (8-11 hours) and prolonged hospital stay (7.3 days) this technique did not have the widespread acceptance it was expected to. According to results published by different authors, LRP can be a reproducible surgery in different centers. It is worth noting that it is also a surgery that has very few contraindications (7,8,11). Mean surgery duration and amount of bleeding vary depending on the surgical technique employed. Nerve-sparing surgery is more difficult and increases the time and amount of the above-mentioned variables (12-16).

Compared with different surgical modalities, LRP reduces abdominal wall morbidity and improves surgical technique precision (and therefore results) by enhancing visualization of the anatomical structures involved in continence and erection without altering oncological results (8, 17).

In our Institute LRP has been used with the intention of greatly reducing morbidity and functional results of RRP as well as shortening hospitalization duration and improving immediate postoperative patient comfort. In this report there were no LRP conversions to conventional surgery. The cases reviewed were those of the last two years and they had been carried out after surpassing the initial learning curve.

Surgical technique variables, complications and functional and oncological results analyzed in the present article are similar to those reported by other authors (Tables 3, 5 and 6).

CONCLUSIONS
We believe the results of the present series support the reproducibility of this technique when patients are adequately selected and the surgical team is properly trained.

The advantages of LRP are that it is a minimally invasive technique with excellent oncological and functional results making the field of laparoscopy and robot-assisted laparoscopic surgery the treatment of choice in patients presenting with localized CaP (2,7).

BIBLIOGRAPHY