



# Radical retropubic prostatectomy in localized prostate cancer treatment: experience at the Centro Médico of the Instituto de Seguridad Social in the State of Mexico

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## ■ ABSTRACT

**Introduction:** Radical retropubic prostatectomy is a therapeutic process that has been shown to be of much benefit in the management of organ-confined prostate cancer patients.

**Objective:** To present retropubic radical prostatectomy experience in organ-confined prostate cancer patients at the authors' hospital department.

**Methods:** The case records of 82 patients having undergone this surgical procedure during the time frame of November 2004 to July 2009 in the authors' hospital department were reviewed. Of that total, 78 were eligible for the study. The variables of age, genetic load for prostate cancer, history of smoking, clinical stage, pathology stage, Gleason score, preoperative and postoperative prostate specific antigen, surgery duration, anesthesia duration, histopathological report, and complications were evaluated for all patients.

## ■ RESUMEN

**Introducción:** La prostatectomía radical retropúbica es un procedimiento terapéutico que ha demostrado ser de mucho beneficio para el manejo de los pacientes con carcinoma de próstata, en etapas confinadas al órgano.

**Objetivos:** Presentar la experiencia de nuestro servicio en el manejo del carcinoma de próstata con este procedimiento quirúrgico, en etapas confinadas al órgano.

**Métodos:** Se revisaron los expedientes de 82 pacientes sometidos a éste procedimiento quirúrgico durante el periodo de noviembre de 2004 a julio de 2009 en nuestro servicio; de los cuales, 78 fueron elegibles para este estudio. En todos los casos se analizó edad, carga genética para Ca prostático, antecedente de tabaquismo, estadio clínico, estadio patológico, suma de Gleason, antígeno prostático específico pre y postoperatorio, tiempo quirúrgico, tiempo anestésico, reporte histopatológico y complicaciones.

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**Results:** Mean age of patients was 63.7 years with a 49-78 year range. Mean preoperative prostate specific antigen value was 9.2 ng/mL, with a 4.3-21.2 ng/mL range, and postoperative prostate specific antigen value was 0.2 ng/mL, with a 0.003- 1.2 ng/mL range. Preoperative Gleason score values from transrectal prostate biopsies were analyzed and well-differentiated tumor was found in 5 patients (6.4%), moderately differentiated tumor in 70 patients (89.7%) and poorly differentiated tumor in 3 patients (3.84%). Histopathological analysis revealed 67 patients (85.8%) with organ-confined tumor and 7 patients (8.9%) with periprostatic infiltration data (4 with capsular infiltration and 3 with seminal vesicle invasion). In 4 patients (5.12%) final histopathological report was negative for tumor disease despite the fact that previous biopsy report had been positive for adenocarcinoma. Mean surgical duration was 104.51 minutes. Complications presenting at 3 months after surgery were: urethral stricture in 13 patients (16.6%), erectile dysfunction in 45 patients (58%) and urinary incontinence in 13 patients (16.6%). Complications presenting at one year after surgery were: erectile dysfunction in 16 patients (33%) and persistent urinary incontinence in 2 patients (3.2%). Of the 78 patients included in the study, no deaths secondary to prostate adenocarcinoma were registered. Maximum follow-up time was 55 months.

**Conclusions:** Radical retropubic prostatectomy was shown to be a useful procedure with very good results for treatment of organ-confined prostate cancer in the population studied.

**Key words:** Prostate, neoplasia, radical retropubic prostatectomy, Mexico.

**Resultados:** La edad promedio de los pacientes fue de 63.7 años con un rango de 49 a 78 años de edad. El valor promedio de antígeno prostático específico prequirúrgico fue de 9.2 ng/mL, con un rango de 4.3 a 21.2 ng/mL; postquirúrgico de 0.2, con un rango de 0.003 a 1.2 ng/mL. Se analizaron los valores prequirúrgicos de Gleason en las biopsias transrectales de próstata; encontrando tumor bien diferenciado en cinco (6.4%) de los pacientes; moderadamente diferenciado en 70 (89.7%) y pobremente diferenciado en tres (3.84%). Posterior al análisis histopatológico se encontró que 67 (85.8%), presentaron tumor confinado al órgano, siete (8.9%) con datos de infiltración periprostatica (cuatro con infiltración capsular y tres con invasión a vesículas seminales), cuatro (5.12%) de los pacientes el reporte histopatológico final se encontró negativo a enfermedad tumoral a pesar de que previamente se contó con biopsia positiva a adenocarcinoma. El tiempo quirúrgico promedio fue de 104.51 minutos. Las complicaciones a los tres meses: estenosis de uretra en 13 pacientes (16.6%), disfunción eréctil en 45 (58%) e incontinencia urinaria en 13 (16.6%). Las complicaciones al año de la cirugía fueron: disfunción eréctil en 16 pacientes (33%) e incontinencia urinaria persistente en dos casos (3.2%). De los 78 pacientes incluidos en este estudio, no se han registrado defunciones secundarias a adenocarcinoma prostático. El seguimiento máximo es de 55 meses.

**Conclusiones:** En nuestro centro, la prostatectomía radical retropúbica demostró ser un procedimiento muy útil y con muy buenos resultados para el tratamiento del carcinoma de próstata confinado a la glándula en la población estudiada.

**Palabras clave:** Próstata, neoplasias, prostatectomía radical retropúbica, México.



## ■ INTRODUCTION

Prostate cancer (CaP) is the most frequent non-cutaneous cancer and the second cause of death by cancer in men in the United States. It was estimated in 2006 that more than 234,000 patients were diagnosed with CaP and it was the cause of death in more than 27,000.<sup>1,2</sup> Because CaP is prevalent in many countries and covers a wide spectrum of malignancy, different treatment methods have been established and as a result, the preferred detection and treatment method is still open to debate. CaP prevalence markedly increases

with age. The presence of microscopic foci in close to a third of men in the fourth and fifth decades of life has been documented in autopsy studies. This number increases to three-fourths in men in the ninth decade of life. In Mexico, based on the 1997 Histopathological Tumor Register, CaP was in third place among tumors in general, with a 6% distribution rate, behind cervical cancer and breast cancer. However, when tumor cases are separated by sex, CaP is in first place for cancers affecting men, representing 17% of cases.<sup>3</sup> CaP arises in the peripheral zone of the prostate gland in 80% of cases which is why there are no signs of obstructive

urinary symptomatology at initial disease stage and up to 60% of cases are first diagnosed when the disease is already in advanced clinical stages.<sup>4</sup>

Natural CaP progression varies from asymptomatic indolent disease during a patient's entire lifetime to highly aggressive cancer with rapid metastasis causing great suffering and ending in death. The physician's challenge is to select effective treatment for each patient. In order to choose adequate treatment potential tumor malignancy, general state of health, life expectancy, and quality of life preferences of the patient must all be evaluated.

The fundamental objective in organ-confined CaP treatment is to remove the tumor and maintain the patient in a disease-free state. To achieve that, different management options are employed: a) radical prostatectomy, consisting of total exeresis of the prostate gland together with both seminal vesicles and the ampullary portion of the deferent ducts,<sup>5-7</sup> b) external radiotherapy or teletherapy,<sup>8,9</sup> c) radioactive seed implant in the organ or brachytherapy,<sup>10</sup> and d) conservative management implicating watchful waiting and treatment when merited by symptomatology.<sup>11,12</sup>

Radical prostatectomy is one of the most widely used curative treatments in uro-oncological centers in developed countries, producing good results in the hands of experts.<sup>13,14</sup> However, it has also been criticized and targeted as aggressive treatment and therefore the abovementioned options are offered. Attempts to compare the effectiveness of surgery with radiotherapy are controversial due to differences in patient selection, clinical and pathological stratification, and treatment failure evaluation.<sup>8,9</sup>

In Mexico radical prostatectomy has been routinely used for only a few years in certain institutions.<sup>15-17</sup> This has come about, in part, due to diagnostic method improvement resulting in early-stage disease identification but also to the interest on the part of urologists to perfect this technique.<sup>18</sup>

The present article is an analysis of initial series results for patients that underwent therapeutic radical prostatectomy at the Urology Service of the *Centro Médico* of the *Instituto de Seguridad Social* of the State of Mexico (*ISSEMyM*).

## ■ METHODS

*Study subjects:* Case records were reviewed of patients with corroborated histopathological diagnosis of organ-confined prostate adenocarcinoma that underwent radical prostatectomy as primary treatment during the time frame of November 2004 to July 2009 at the authors' hospital department.

*Tumor staging:* In each patient tumor stage was determined by means of complete clinical examination, including digital rectal examination (DRE). Before surgery the following basic laboratory and radiology studies were carried out: complete blood count, blood chemistry, clotting tests, serum prostate specific antigen (PSA) measurement, transrectal ultrasound of the prostate, and prostate biopsy.

Systemic disease was ruled out in certain patients with PSA values above 20 ng/dL, based on negative bone scintigram with Tc99. Computed axial tomography (CAT) was done on some patients. The International Union Against Cancer (French initials UICC for *Union Internationale Contre le Cancer*) 1997 TNM clinical staging system<sup>20</sup> was used as follows:

Tx: primary tumor cannot be evaluated T0: no proof of primary tumor, T1: tumor not palpable or visible using imaging techniques, T1a: tumor detected incidentally in transurethral resection of  $\leq$  5% of resected tissue, T1b: tumor detected incidentally in transurethral resection 5% of resected tissue, T1c: tumor identified by means of biopsy sample (for example, as a consequence of elevated PSA), T2: palpable tumor limited to the prostate, T2a: tumor affecting less than half of a lobe, T2b: tumor affecting more than half a lobe but not both lobes, T2c: tumor affecting more than one lobe, T3: tumor palpable beyond the prostate T3a: unilateral extracapsular extension, T3b: bilateral extracapsular extension, T3c: tumor invading seminal vesicles, T4: fixed tumor or tumor invading adjacent structures different from the seminal vesicles, T4a: tumor invading bladder neck, external sphincter muscle, rectum, T4b: tumor invading ani levator muscle or fixed to pelvic wall.

Subjects that clinically presented with staging between T1a and T2c were classified as patients with organ-defined disease. Those patients with T3a or higher were classified as patients with locally advanced disease.

*Grading:* Biopsy histopathological result was expressed according to Gleason grade.<sup>19</sup> A scale according to glandular differentiation of the tumor was used with a minimum of 1 and a maximum of 5. Gleason score is the sum of the greatest and least differentiated zones of the same tumor.

The result indicates glandular differentiation grade of the tumor: a sum of 2-4 is a well-differentiated tumor, 5-7 a moderately differentiated tumor and 8-10 a poorly differentiated tumor.

*Pathological stage:* Pathological stage was established based on the UICC 1997 TNM System,<sup>20</sup> according to histopathological analysis of the surgical specimen. *Follow-up:* Follow-up was carried out with visits every 3 months during the first postoperative

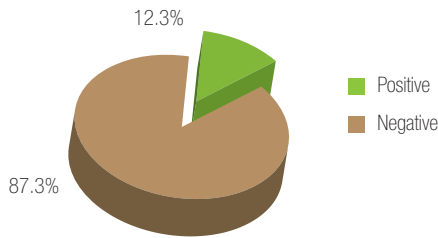
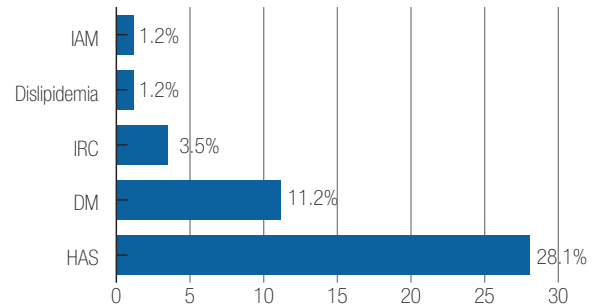


Image 1. Genetic load for prostate cancer.



AMI: Acute myocardial infarction; CRI: Chronic renal insufficiency; DM: Diabetes Mellitus; SAH: Systemic arterial hypertension.

Image 2. Associated comorbidity.

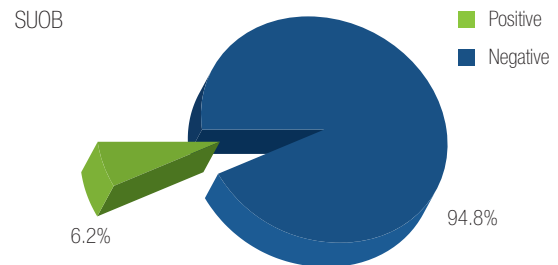
year that consisted of physical examination and PSA measurement. *Residual disease and disease progression:* Residual disease was established when patients presented with: 1) positive surgical margins, 2) serum PSA values above the standard (0.2 ng/mL) after prostatectomy.

Disease progression was considered to exist when patient presented with: 1) postoperative DRE with palpable mass and 2) elevated PSA value after normal control.

*Complications:* Complications were classified as immediate and late. Immediate complications included: intraoperative bleeding, adjacent organ injury, surgical wound infection, and cystostomy leak. Late complications were: impotence, incontinence, or urethrovaginal junction stenosis.

## RESULTS

A total of 81 case records were reviewed, 78 of which were found to be complete and with adequate follow-up in postoperative consultations and so were included in the study. Mean age of patients was 63.7 years with a 49-78 year range. Of the patients included in the study, 12.7% had positive genetic load for prostate adenocarcinoma and 87.3% did not (Image 1). In regard to important medical history, 29.5% of patients were smokers. Associated comorbidity included high blood pressure in 28.1% of patients, diabetes mellitus in 11.2%, chronic renal insufficiency in 3.5%, acute myocardial infarction in 1.2%, and dyslipidemia in 1.2% (Image 2). Seventy-four patients (94.8%) complained of lower obstructive symptomatology in the clinical interview (Image 3). Mean preoperative PSA value was 9.2 ng/mL, with a 4.3 - 21.2 ng/mL range. Mean postoperative PSA value was 0.2 ng/mL, with a 0.003 - 1.2 ng/mL range (Image 4). One patient had a postoperative PSA value of 1.2 at one month that was regarded as biochemical recurrence and required adjuvant management.



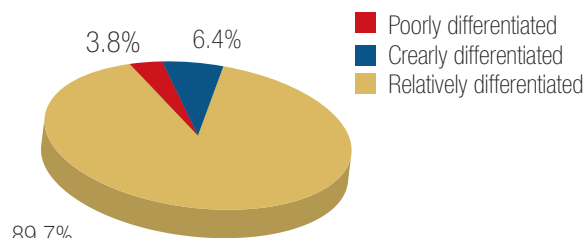
LUOS: lower urinary obstructive syndrome

Image 3. Patients with lower urinary symptomatology.

Preoperative Gleason values from transrectal biopsies of the prostate were analyzed, resulting in 5 patients (6.4%) with well-differentiated tumor (Gleason 2-4), 70 patients (89.7%) with moderately-differentiated tumor (Gleason 5-7), and 3 patients (3.84%) with poorly-differentiated tumor (Gleason 8-10).

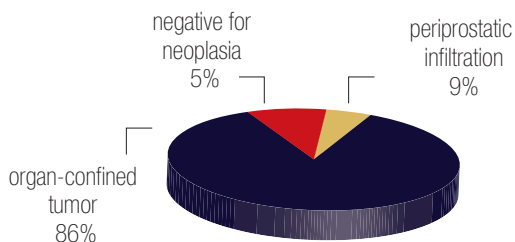
Of the 78 patients included in the study that underwent surgery, 100% were classified in preoperative clinically localized or organ-confined stage. Seven patients (8.95) were in clinical stage T1 (all in stage T1c). The rest of the patients (91.02%) were in stage T2 (21 [26.9%] in T2a, 13 [16.6%] in T2b and 37 [47.4%] in T2c). None of the patients that underwent surgery were classified as T3 or T4 (Image 5).

Postoperative histopathological analysis showed that 67 patients (85.8%) presented with organ-confined tumor, 7 patients (8.9%) with periprostatic infiltration data (4 with capsular infiltration and 3 with seminal vesicle invasion). Final histopathological study reported

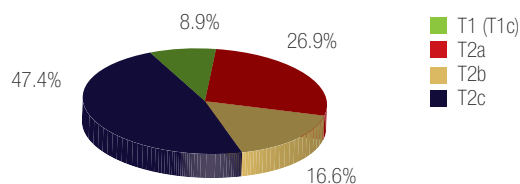


TRBP: Transrectal biopsy of the prostate

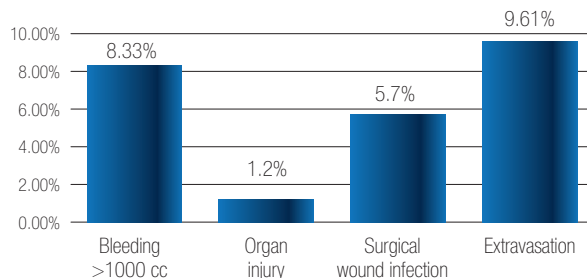
**Image 4.** Histopathological cellular differentiation grade.



**Image 6.** Final histopathological report indicating tumor extension and localization.



**Image 5.** TNM clinical stage.



**Image 7.** Immediate complications.

no neoplastic disease in 4 patients (5.12%), even though previous biopsy had been positive for adenocarcinoma (**Image 6**).

Adjuvant therapy was required in the 4 locally advanced disease cases; 2 in stage T3a and 2 in stage T3b with biochemical recurrence. Adjuvant therapy was also employed in 3 patients with organ-confined disease that presented with biochemical recurrence during follow-up.

Intrasurgical bleeding over 1000 mL was quantified as an immediate complication in 8.33% of cases that received platelet concentrate transfusion. One patient (1.2%) had adjacent organ injury due to perforation of the anterior side of the rectum that was resolved by means of primary closure in two planes with no further complications. Surgical wound infection presented in 5.7% of patients, urine extravasation through anastomosis presented in 9.61% of patients and was resolved before the fifth postoperative day by means of conservative management, only (**Image 7**).

*Complications at 3 months:* Urethral stricture presented in 13 patients (16.6%) and erectile dysfunction in 45 patients (58%). Urinary incontinence (UI) presented in 13 patients (16.6%) (**Image 8**). Complications at 1 year were erectile dysfunction in 16 patients (33%) and persistent UI in 2 patients (3.2%) (**Image 9**). There have been no reported deaths for the 78 patients included in the study. Maximum follow-up was 55 months.

## DISCUSSION

Radical prostatectomy is one of the principal therapeutic options for localized stages of prostate cancer (CaP). Long term results of this procedure have been analyzed in large series demonstrating its advantages over radiotherapy, brachytherapy and watchful waiting.<sup>8-12,14,27</sup>

The morbidity observed in the present study is comparable to that registered in other reports.<sup>21-25</sup>

The most frequent complication in the patients of the present study was postoperative erectile

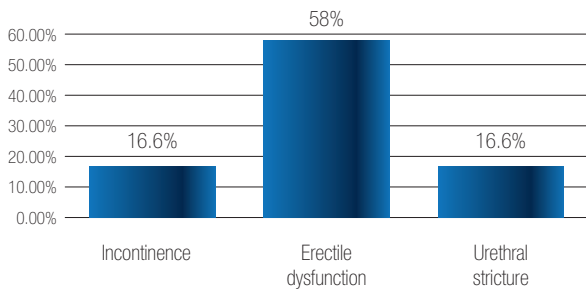


Image 8. Complications at 3 months.

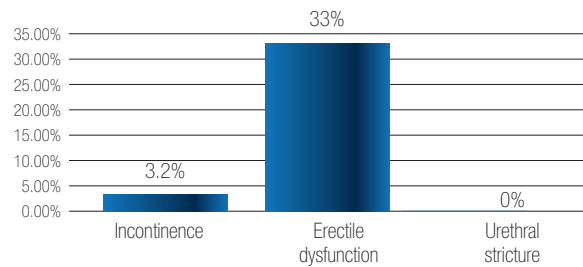


Image 9. Postoperative complications at one year.

dysfunction and was similar to that observed by Walsh and Catalana.<sup>6,25</sup>

Urinary incontinence (UI) was evaluated in all patients during the study and resulted in 2 postoperative cases (3%) at one year. This figure is comparable to that reported by other authors.<sup>21</sup> In an extensive review of the literature, Steiner et al demonstrated that UI after prostatectomy varies from 63-96%. Urge incontinence presents from 0-35% and total incontinence from 0-17%. This situation improved to the degree the technique was perfected and the amount of bleeding was markedly reduced in relation to greater procedure expertise.<sup>21</sup>

Injury to the rectum has been reported at 1-7% of cases in different studies.<sup>22-24</sup> In the present study there was only one such case and it represented 1.2% of complications.

Radical prostatectomy has been performed at the *Centro Médico* of the *Instituto de Seguridad Social* of the State of Mexico since the end of 2004 and has become a

routine therapeutic option in the management of localized stages of CaP, with results that are comparable to those reported in the international literature (Table 1).

## CONCLUSIONS

Radical retropubic prostatectomy is an effective procedure for treating organ-confined CaP. Despite its being an excellent therapeutic option, intraoperative and postoperative complications may still present. The more important ones are late complications such as urinary incontinence and erectile dysfunction that on occasion can lead both the patient and the physician to choose a management alternative. However, the results obtained at the authors' hospital department fall within the adequate safety ranges reported in the literature.

The early detection methods employed in the authors' service (PSA, DRE, and transrectal ultrasound-guided biopsy of the prostate) have facilitated the

Table 1. Localized stage prostate cancer management compared with results from other studies.

	Janet L Stanford	Jim C Hu	Shin-ichi Hisasue Sapporo	Christian Barre	Walsh	Catalana	ISSEMyM	H. Manzanilla
	Seattle	California	Japan	France	Johns Hopkins	Washington	Toluca	H General de México
Hospital stay	1921	12 079	123	231	503	3478	78	72
EIH	-----	5.1 d	-----	-----	-----	-----	4.2 d	-----
Follow-up period	2 years 12 cities US	7 years Medicare	13 yeras	1.5 years	12 months	20 years	5 years	5 years
Incontinence	8.4%	4%	12.7%	6.7%	6%	7%	3.2%	24%
Erectile dysfunction	59.9%	33%	-----	29.6%	32%	25%	33%	73%
Urethral stricture	-----	43%	6%	-----	-----	2.7%	16%	11%

detection of a majority of patients with organ-confined disease for whom radical surgery management has shown free-from-recurrence, curative results up to the present time.

## BIBLIOGRAPHY

1. Parker SL, Tong T, Bolden BA. Cancer statistics 1995. *Cancer J Clin.* 1996;46:25-8.
2. Miller BA, Ries LAG, Hankey BF. SEER Cancer statistics review: 1973-1990. National Cancer Institute of Health, NHI Pub No. 93 2789, 1993.
3. Tapia CR, Macías MC, Kuri MP. En: Registro histopatológico de neoplasias en México. México: JGH Edit, 1999:15-16.
4. Villers AA, McNeal JE, Freiha FS. Development of prostatic carcinoma: morphometric and pathologic features of early stages. *Acta Oncol* 1991;30(2):145-51.
5. Chute R. Radical retropubic prostatectomy for cancer. *J Urol* 1954;71(3):347-72.
6. Walsh PC, Lepor H, Eggleston JC. Radical Prostatectomy with preservation of sexual function: anatomical and pathological considerations. *Prostate* 1983;4(5):473-85.
7. Freiha FS. Radical retropubic prostatectomy. In: Sakti D, Crawford ED (eds). *Cancer of the prostate*. USA: Dekker, 1993:189-223.
8. Kupelian P, Katcher J, Levin H. External beam radiotherapy versus radical prostatectomy for clinical stage T1-2 prostate cancer: therapeutic implications of stratification by pretreatment PSA levels and biopsy Gleason scores. *Cancer J Sci Am* 1997;3(2):78-87.
9. Richie JP. Localized prostate cancer: overview of surgical management. *Urology* 1997;49(3A Suppl):35-37.
10. Polascik TJ, Pound CR, DeWeese TL. Comparison of radical prostatectomy and iodine 125 interstitial radiotherapy for the treatment of clinically localized prostate cancer: A 7 year biochemical PSA progression analysis. *Urology* 1998;51:884-889.
11. Albertsen PC. Early-stage prostate cancer. When is observation appropriate? *Hematol Oncol Clin North Am* 1996;10(3):611-625.
12. Hugosson J, Aus G. Natural course of localized prostate cancer. A personal view with a review of published papers. *Anticancer Res* 1997;17(3A):1441-1448.
13. Walsh PC. Anatomic radical prostatectomy: Evolution of the surgical technique. *J Urol* 1998;160(6 Pt 2):2418-2424.
14. Krongrad A, Lai H, Lai S. Survival after radical prostatectomy. *JAMA* 1997;278(1):44-46.
15. Neyra AJ, Rodríguez LA. Prostatectomía radical retropúbica en el cáncer localizado de la próstata. Seguimiento a largo plazo. *Rev Mex Urol* 1992;52(5):131-136.
16. Martínez CP, Calderón FF, Pacheco GC. Seguimiento de pacientes con prostatectomía radical. Experiencia en el Hospital General Dr. Manuel Gea González. *Rev Mex Urol* 1996;56(1):17-20.
17. Zonana FE, Pámanes OA, Zárata OA. Complicaciones de la prostatectomía radical. Experiencia en el Hospital Central Militar. *Rev Mex Urol*. 1996;56(1):21-9.
18. Herranz Amo F, Díez Cordero JM, Verdú Tartajo F. Effectiveness of transrectal ultrasonography in local staging of prostatic cancer. *Actas Urol Esp* 1997;21(6):590-597.
19. Gleason DF. Histologic grading and clinical staging of prostatic carcinoma. In: Tannenbaum M (ed). *Urologic pathology*. The prostate. Philadelphia: Lea & Febiger, 1977:171-98.
20. Spiessl B, Beahrs OH, Hermanek P, Hutter RV, Scheibe O, Sobin LH, Wagner G. TNM atlas. Illustrated guide to the TNM/pTNM classification of malignant tumors. Barcelona: Springer-Verlag Ibérica, 1995:231-287.
21. Leandri P, Rossignol G. Radical retropubic prostatectomy: Morbidity and quality of life. Experience with 620 consecutive cases. *J Urol* 1992;147(3 Pt 2):883-887.
22. Gibbons RP, Correa RJ Jr, Brannen GE. Total prostatectomy for localized prostatic cancer. *J Urol* 1984;131(1):73-76.
23. Gibbons RP, Correa RJ Jr, Brannen GE. Total prostatectomy for clinically localized prostatic cancer: Long term results. *J Urol* 1989;141(3):564-566.
24. Zincke H, Oesterling JE. Long term (15 years) results after radical prostatectomy for clinically localized (stage T2c or lower) prostate cancer. *J Urol*. 1994;152(5 Pt 2):1850-7.
25. Catalona WJ, Bigg SW. Nerve-sparing radical prostatectomy: evaluation of results after 250 patients. *J Urol* 1990;143(3):538-43.
26. Steiner MS, Morton RC, Walsh PC. Impact of anatomical radical prostatectomy on urinary continence. *J Urol* 1991;145(3):512-4.
27. Manzanilla-García HA et al. Prostatectomía radical retropúbica en cáncer de próstata. *Rev Med Hosp Gen Mex* 2000;63(2):91-97.