

Radical Prostatectomy Outcomes at the University Hospital of the West Indies: 2000–2007

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ABSTRACT

Objectives: Prostate cancer is the commonest cancer in Jamaican men with an age-specific incidence of 65.5 per 100 000 and also the commonest cause of male cancer death. This study reports on the oncological outcome and morbidity after radical retropubic prostatectomy.

Subjects and Methods: The records of 116 patients with clinically localized prostate cancer (cT1c- T2) who underwent radical retropubic prostatectomy at the University Hospital of the West Indies from January 2000 to December 2007 were examined. Preoperative Prostate specific antigen (PSA), clinical stage and Gleason score were recorded. Operative time, blood loss, hospital stay and complications were assessed. Oncological outcome was assessed using biochemical progression. Disease progression was defined by PSA value of 0.4 ng/ml or greater.

Results: Mean patient age was 61 (43-75) years. The mean presenting PSA was 10.1 (2-25.1) ng/ml. Mean Gleason score on preoperative biopsy was 6. The commonest clinical stage was T1c (68%). Nodal involvement was seen in only one patient. The positive surgical margin rate was 15.5%. Mean operating time was 246 minutes and mean estimated blood loss was 1.44 L. The mean hospital stay was 6.9 days and 17% of patients developed minor complications, with no treatment or disease related deaths. Five-year biochemical-free survival was 78.4%.

Conclusions: Oncological outcomes after radical retropubic prostatectomy in Jamaica appear to meet global standards with acceptable morbidity.

Key words: Jamaica, outcome assessment, prostate cancer, retropubic prostatectomy

Evolución Clínica de la Prostatectomía Radical en el Hospital Universitario de West Indies: 2000–2007

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RESUMEN

Objetivos: El cáncer de la próstata es el cáncer más común entre los hombres jamaicanos con una incidencia específica por edad de 65.5 por 100 000, y es también la causa más común de la muerte por cáncer entre los hombres. Este estudio reporta la evolución clínica oncológica y la morbilidad tras la prostatectomía radical retropúbica.

Métodos: Se examinaron las historias clínicas de 116 pacientes con cáncer de próstata clínicamente localizado (cT1c – T2), sometidos a prostatectomía radical retropúbica en el Hospital Universitario de West Indies de enero de 2000 a diciembre 2007. Se registraron el antígeno específico de próstata (AEP) preoperativo, la etapa clínica y la puntuación de Gleason. Se evaluaron el tiempo operativo, la pérdida de sangre, la estadía hospitalaria, y las complicaciones. Se evaluó la evolución clínica oncológica usando la progresión bioquímica. La progresión de la enfermedad se definió por el valor del AEP de 0.4 ng/ml o mayor.

Resultados: La edad promedio de los pacientes fue 61 (43-75) años. El AEP promedio fue PSA 10.1 (2-25.1) ng/ml. La puntuación promedio Gleason en la biopsia preoperativa fue 6. La etapa clínica más común fue T1c (68%). Se observó compromiso de nódulos en sólo un paciente.

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La tasa de márgenes quirúrgicos positivos fue 15.5%. El tiempo promedio de operación fue 246 minutos y la pérdida de sangre promedio estimada fue 1.44 L. La estadía hospitalaria promedio fue de 6.9 días y 17% de los pacientes desarrollaron complicaciones menores, sin tratamiento o enfermedad relacionados con muertes. La supervivencia quinquenal libre del uso de productos bioquímicos fue 78.4%.

Conclusiones: Los resultados oncológicos después de la prostatectomía retropúbica radical en Jamaica muestran estar en correspondencia con los estándares globales con una morbilidad aceptable.

Palabras claves: Jamaica, evaluación de la evolución clínica, cáncer de próstata, prostatectomía

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INTRODUCTION

Prostate cancer is the leading cancer in Jamaican men, with an annual age-specific incidence rate of 65.5 per 100 000 (1). Glover *et al* reported an annual age-specific incidence rate as high as 302 per 100 000 (2). It is also the commonest cause of male cancer-related deaths in Jamaica (3). With the introduction of PSA (prostate specific antigen) testing in Jamaica in 1991, more cases of prostate cancer are being diagnosed.

Radical prostatectomy is considered the gold standard of treatment of organ-confined prostate cancer (4). The nerve-sparing retropubic approach was described by Walsh and Donker in 1982 (5). The outcomes of this operation may be judged by oncological and functional results. Oncological outcomes may be assessed by biochemical progression. Biochemical recurrence may be defined as any postoperative PSA > 0.4 ng/ml (4). Functional outcomes may be assessed by postoperative continence and erectile function. An assessment of operative time, blood loss, transfusion requirements, hospital stay and peri-operative complications are important. This study presents the eight-year oncological outcomes and morbidity assessment post-radical prostatectomy in a sample of Jamaican men, managed at an academic centre.

SUBJECTS AND METHODS

Patients

The study comprised 116 patients with clinically localized prostate cancer (stage T1c- T2c), who underwent open radical retropubic prostatectomy between January 2000 and December 2007 at the University Hospital of the West Indies, (UHWI) Mona, Jamaica. All hospital records were reviewed. The surgical procedure described was the nerve-sparing radical retropubic prostatectomy, as described by Walsh (5). In all cases, obturator lymphadenectomy was performed.

Preoperative evaluation of all patients was done by a urologist. This included performing a digital rectal examination (DRE) and measuring serum PSA and using micro-particle enzyme immunoassay method. Tumours were clinically staged according to the Tumour Node Metastases (TNM) classification. Transrectal ultrasound biopsy was performed on all patients. Biopsies were graded using the Gleason scoring system (6). Radionuclide bone scanning was done in selected cases Pathology reports were obtained

from the Pathology Department, University Hospital of the West Indies. The pathological stage, nodal involvement, margin status, seminal vesicle invasion and extra-prostatic extension were reported.

Postoperative follow-up consisted of clinical examinations and serial PSA measurements. Biochemical recurrence was defined as PSA > 0.4 ng/ml. Operative time, blood loss, hospital stay and peri-operative complications were assessed.

Values are presented as counts or means with standard deviations as appropriate. Survival analysis was performed to assess five-year biochemical-free survival. Patients without progression were censored at the most recent follow-up.

RESULTS

The mean age of the sample of patients was 61.1 (range 43–75) years, with a mean preoperative PSA of 10.1 ng/ml [range 2–25.1] (Table 1). All tumours were clinically organ-

Table 1: Patient characteristics

Age (years)	61.1 +/- 6.9 (43-75)
PSA (ng/ml)	10.1 +/- 4.6 (2-25.1)
Gleason score (biopsy)	6.6 +/- 0.7 (6-9)
Clinical stage	
T1a-b	2 (2%)
T1c	79 (68%)
T2a	28 (24%)
T2b/c	5 (4%)
Pathological stage	
pT2	105 (91%)
pT3	9 (7%)
Positive nodes	1 (1%)
Gleason score (specimen)	6.7+/- (5-9)
Positive surgical margin	18 (15.5%)
Seminal vesicle invasion	4 (3.5%)
Extraprostatic extension	9 (7.8%)

confined. The most prevalent clinical stage was T1c, which was seen in 79 (68%) patients. The mean preoperative Gleason score was 6.6 (range 6–9).

Of the 116 cases, 105 (91%) were pathological stage T2; while 9 (7%) were T3. Mean Gleason score on the prostatectomy specimen was 6.7 (range 5–9). There was only one case with positive nodes; nine cases (7.8%) showed extraprostatic extension. Of the cases, 18 (15.5%) had posi-

tive surgical margins and four (3.5%) had seminal vesicle invasion (Tables 1, 2).

Table 2: Comparison of oncological outcomes of radical prostatectomy: UHWI compared to selected series

Institution	%	Study Year
Positive Margins		
University of Miami (Simon <i>et al</i>) (24)	37	2006
MSK, Baylor (Swindle <i>et al</i>) (25)	12.9	2005
Johns Hopkins (Eastham <i>et al</i>) (26)	11.2	2007
NYU (Lepor <i>et al</i>) (27)	8	2003
UHWI (Morrison <i>et al</i>)	15.5	2009
Biochemical Free Survival Rate		
Johns Hopkins (Han <i>et al</i>) (28)	84 (5 y)	
	72 (10 y)	2003
Washington University (Roehl <i>et al</i>) (29)	68 (10 y)	2004
MSK (Bianco <i>et al</i>)	82 (5 y)	
	77 (1 y)	2005
University of South Carolina (Hull <i>et al</i>) (30)	75 (10 y)	2002
UHWI (Morrison <i>et al</i>)	78.4 (5 y)	2009

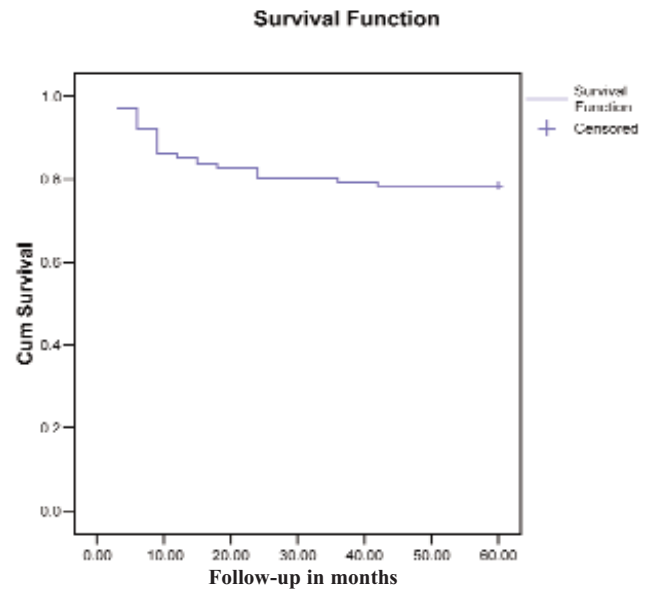


Figure: Biochemical progression-free actuarial survival

Table 3: Comparison of morbidity of radical prostatectomy: UHWI and selected centres

Institution	Operative Time (min)	Estimated Blood Loss (ml)	Hospital Stay (days)	Complication Rate (%)
NYU (Lepor <i>et al</i>) (27)	119	–	2.11	10.6
Washington Univ. (Catalona <i>et al</i>) (31)	217	1395	2.4	10
UHWI (Morrison <i>et al</i>)	246	1440	6.9	17

Major complications were rare (Table 3). Of the 116 cases, 18 (17%) developed complications. There was no mortality related to surgery. The commonest complication was an anastomotic stricture which occurred in eight (7%) patients. There was one case of pulmonary embolism. Mean operating time was 246 minutes. Mean estimated blood loss was 1.44L and mean hospital stay was 6.9 days. Five-year biochemical-free survival was 78.4% (Table 2, Fig. 1). Mean time to biochemical failure was 12 months.

DISCUSSION

Jamaica has a population of 2.7 million inhabitants, with 91% of the population of African ethnicity (7). For several decades, prostate cancer has consistently been the leading cause of cancer as well as cancer mortality in Jamaican men (1, 8, 9). Prostate cancer represents 37% of all male cancers in Jamaica (1). Glover *et al* reported an annual age-specific incidence rate as high as 302 per 100 000 (2). However, this is four-fold greater than the rate of 65.5 per 100 000 reported from the Jamaica Cancer Registry (1). The incidence rate obtained from the Jamaica Cancer Registry places Jamaica in a category with one of the lowest incidence rates in the world. The reason for the discrepancy in incidence rates

between the reports is probably due to ascertainment bias. Notwithstanding the discrepancy, it is clear that this disease is a major problem on this island.

Identifiable risk factors for prostate cancer include advanced age, genetics, diet and ethnicity (10). Men of African ancestry have long been recognized to be at high risk for developing prostate cancer (10). In the United States of America (USA), the incidence rate of prostate cancer is about ~60% higher in African Americans than in European Americans (11, 12). African-Americans have the highest reported incidence rates of prostate cancer among all ethnic groups in the USA. The incidence rates in African-Americans and European-Americans for the period 2001–5 were 248.5 per 100 000 and 156.7 per 100 000 of the population, respectively (11). In sub-Saharan Africa, reporting of prostate cancer is deficient. However, very high incidence rates have been reported in certain African territories such as Nigeria, where the incidence rate is 127 per 100 000 population (13). Tobago reported a screen detected prevalence rate of prostate cancer of 10% (14). The consistently higher incidence rates in men of African descent may suggest a shared increased genetic susceptibility related to ancestral origins. Indeed lifestyle and environmental factors may modulate this

genetic susceptibility. In addition, there appears to be a difference in the biology of prostate cancer in persons of African ethnicity. Compared with European-Americans, African-Americans present at a younger age and have a more advanced clinical stage and higher Gleason score on initial presentation. Five-year survival outcomes are poorer for African-Americans and recurrence is higher (12).

It has been recognized that higher Gleason grade and PSA correlate with advanced clinical and pathological stage (15). Prostate cancer is commonly diagnosed at an advanced stage in Jamaican men (2). Glover *et al* reported on cases of prostate cancer diagnosed in the Kingston and St Andrew region of Jamaica from 1989–1994. Of the 1121 cases, 42% had at least clinical stage T2 disease and 16% had bone metastases on presentation (2). A retrospective study of prostate cancer in a private urology practice in Kingston and St Andrew, from 1993–1997, demonstrated that 80% of patients diagnosed were symptomatic. Median PSA was 37 ng/ml and 60% of cases were of Gleason 8–10 (16). Coard *et al* reported that of the 529 men diagnosed with prostate cancer at the University Hospital of the West Indies, Jamaica, from 2000–2005, only 18.5% had a PSA < 10 ng/ml (17). The maximum recorded PSA was 14 260 ng/ml and 31.6% of men had PSA >100ng/ml; 30.2% of patients had Gleason 8–10 adenocarcinoma on biopsy. However, at the UHWI, most cases seen are symptomatic and hence present at a later clinical stage. Despite the introduction of PSA in Jamaica in 1991, widespread screening is still not practised; hence these presenting features were advanced. Though the USA has no national programme for screening, with more widespread screening of at risk groups, a stage migration has been seen and many patients present with clinically localized prostate cancer (18). Radical prostatectomy is a curative option for patients with organ-confined prostate cancer. However, as Coard *et al* demonstrated, most cases of prostate cancer diagnosed at the University Hospital of the West Indies, Jamaica, are not organ-confined; hence curative options are less common.

Screening can only be effective if the at risk population avail themselves of the facility. However, there are several barriers to widespread screening in Jamaica; some of which have previously been reported in African-Americans in the USA. These may be economic or non-economic barriers. Major economic challenges in Jamaica include lack of access to healthcare resources or inability to afford screening tests. However, the non-economic barriers appear to be more pervasive. Jamaican men demonstrate poor health-seeking behaviour. Men also volunteer issues related to perceived changes in their sex-lives after diagnosis of prostate cancer, as well as fear and embarrassment of the digital rectal examination (19, 20). The Jamaica Health and Lifestyle Survey 11 reported that 79.2% of the 891 men sampled had never had a digital rectal examination [DRE] (21). Men also have a fear of the diagnosis of prostate cancer and have religious or

superstitious fears about prostate cancer. Screening and treatment options are often dictated by experiences or knowledge of friends and family members, which may not always be valid.

The primary aims of radical prostatectomy are to achieve good oncological and functional outcomes (potency and continence). This study was limited to the evaluation of oncological outcomes due to non-standardized reporting of functional status in this retrospective review. Radical prostatectomy may be associated with significant blood loss, incontinence and erectile dysfunction. Though, the open procedure is still considered the gold standard, minimal invasive procedures have recently challenged the outcomes of the open procedure. There has been considerable improvement in the understanding of the prostate anatomy, which has improved outcomes of this operation.

Of the 116 patients who were considered to have organ-confined disease preoperatively, 9 (7%) were considered to be non-organ-confined at pathology. This rate of under-staging is less than that of 50–60% reported internationally (22). However, this difference could be due to the small sample size, largely favourable Gleason scores and method of tissue sampling. Several reports of pathological examination of the prostate involve complete embedding and histological examination of the entire prostate. Though, the pathology laboratory extensively samples the prostate, there could conceivably be a few cases of missed capsular penetration. The incidence of 15.5% positive margins in the present study compares favourably with international reports of 11–31%. (Table 2). A positive surgical margin in the radical prostatectomy specimen is associated with biochemical and local recurrence and possible need for adjuvant treatment (23). This rate is directly associated with PSA, Gleason score and surgical technique. Decreasing rates have been associated with improved surgical technique and stage migration. The five-year biochemical-free survival rate of 78.4% was comparable with other published reports (Table 2).

A comparison of outcomes between the present series and international reports is shown in Table 3. The mean operative time was marginally greater than other reports and mean hospital stay was longer. Longer hospital stay could be due in part to patient expectations and cultural beliefs and the reluctance for early discharge from hospital, despite being clinically stable. However, estimated blood loss was comparable. The complication rate of 17% was higher than some quoted series. However, this figure represents early and late, major and minor complications, which may not be reported in some series. Limitations of this study include the retrospective nature and small sample size. All procedures were not performed by a single surgeon as the UHWI is a teaching facility; hence residents in training were involved in all procedures. Despite low surgical volumes, outcomes appear to be comparable to internationally published series.

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