The Frequency of Prostatic Involvement in Radical Cystectomy Specimens for Transitional Cell Carcinoma of the Bladder

Abbas Basiri, Ardalan Ozhand, Hormoz Karami, Halimi Asl Parham, Mohammad Reza Safarinejad
Urology and Nephrology Research Center, Department of Urology, Shaheed Labbafinejad Hospital, Shahid Beheshti University (MS), Tehran, Iran

Abstract

Objective: To evaluate the frequency of prostatic involvement in pathologic samples of the patients who had undergone radical cystectomy due to transitional cell carcinoma (TCC) of the bladder.

Materials: The files of the patients who had been subjected to radical cystectomy due to bladder TCC between 1998 and 2004 were evaluated retrospectively. A total of 164 radical cystectomies had been done during this period. .Seventeen cases were excluded because the primary tumour was not TCC or the patient had previously undergone prostatectomy.

Results: Of 147 patients, 36 (24/4%) had prostate TCC and 19 (12.9%) had prostate adenocarcinoma. Two patients had both TCC and prostate adenocarcinoma. Twenty-one cases had superficial bladder cancer (T1) and prostatic involvement was detected in TCC cases but in 9.5% of those with adenocarcinoma. The prevalence of prostate adenocarcinoma in radical cystectomy samples (due to bladder TCC) is much lower in Iranian patients in comparison with the European and American patients (vs 12.9 and 17.5 to 45%, respectively).

Conclusion: Prostatic involvement by TCC had a direct relation with the stage (P=.01) and grade (P=.008) of the bladder tumour. If we try to preserve the prostate or its capsule during the radical cystectomy procedure, attention to these findings is worthwhile (JPMA 58:479;2008).

Introduction

The distribution of cancer varies significantly from country to country all over the world. The latest estimates of global cancer incidence show that prostate cancer has become the third most common cancer in men, with half a million new cases every year, almost 10% of all cancers in males.[1] The lifetime risk of clinically detected prostate cancer is 9.5%, and the probability of dying from prostate cancer is 3%.[2] The frequency of incidentally detected cancer is approximately 42% in men older than 50 years of age;[2] the frequency of autopsy-detected cancer is similar or higher.[3] In no other malignancy, there is such a vast reservoir of undetected cases that may never be clinically significant or cause death.[3] Prostate cancer incidence is characterized by a very large geographical variability. Asian countries present much lower rates of occurrence of the disease when compared to North and Western European countries, with South American countries displaying an intermediate incidence rate.[4] The incidence of clinical prostate cancer in black men is greater than in any other ethnic group.[5] It is much lower in Asian than the Western population.[6] The incidence of prostate cancer is considerably low in Orientals. Such differences seem to be linked to ethnic characteristics. Because Iranian men are ethnically and racially different from most of Asian countries' men (e.g. Japanese, Chinese, and Arabic men) prevalence of prostate cancer should be different.[7]

Radical cystectomy is the treatment of choice for muscle invasive transitional cell carcinoma (TCC) of the bladder.[8] Of the most important complications of radical cystectomy is erectile dysfunction or impotence due to the cutting of neurovascular bundle during the excision of prostate.[8]

A proposed method for preservation of neurovascular bundle is radical cystectomy with prostatic capsule preservation. During the capsule sparing surgery, a piece of the peripheral tissue of the prostate is preserved with the capsule. Since the involvement of prostatic capsule in TCC is reported to be about 43%, keeping this residue

may result in tumour recurrence. However, due to preservation of the external sphincter, better continence is achieved and the probability of stricture formation in the anastomosis area is reduced. Incidental prostatic adenocarcinoma in patients with PSA less than 4 ng/mL undergoing radical cystoprostatectomy for bladder cancer in Iranian men is 14%,[9] but involvement of prostate with TCC in radical cystectomy specimens had to be determined. In this study, we evaluated the prevalence of prostatic involvement in radical cystectomy specimens obtained from patients with bladder TCC.

Material and Methods

We retrospectively evaluated the radical cystectomy specimens of patients with invasive bladder TCC. These were done in Shaheed Labbafinejad hospital between March 1998 and April 2004. Patients with previous history of prostate surgery and bladder tumours other than TCC, were excluded. The pathologic specimens were processed according to usual technique. The specimens were measured and weighed and their outer surfaces were inked and they were opened totally and fixed in buffered formalin for 24 hours. The specimens were sectioned into 10mm slices and after that, slices with 3-5 micrometres in thickness were obtained. Resultant histological slides were stained by haematoxylin-eosin. All pathologic specimens were examined with 2 expert pathologists independently. Staging and grading of tumours were done according to 1997 AJCC TNM classification.[10] and Gleason scoring system,[11] respectively. Of 164 radical cystectomies, 17 were excluded.

Independent t test was used for statistical analysis. A p-value less than 0.05 was considered statistically significant. Statistical analysis was performed using the computer statistical package SPSS/11.0.

Results

Of 147 patients evaluated, 36 (24.4%) and 19 (12.9%) had prostate involvement by TCC or adenocarcinoma of prostate, respectively. In 2 cases, the concurrent involvement by both TCC and adenocarcinoma was detected. The pathologic grade and stage of the tumours are shown on the Table1. None of the patients with stage T1 bladder tumours had prostate involvement, while of patients with stage T4 bladder tumour, 70.4% had prostate involvement by TCC (P=.01). Of patients with stage T1 and T4 tumours, 9.5% and 16.6% had prostate adenocarcinoma, respectively. It means that, in patients with higher stages of bladder TCC, the probability of simultaneous presence of prostate adenocarcinoma is also high. However, this difference was not statistically significant (P=0.08). Of all the subjects, 60 and 87 patients had grade II and grade III

Table1: Pathologic Grade and Stage of the Bladder Tumor (%).

Bladder TCC	Prostate TCC	Prostate adenocarcinoma
T1(21 patients)	-	2(9.5)
T2(28patients)	2(7.1)	3(9.5)
T3(54ppatients)	5(9.2)	9(15.9)
T4(44 patients)	31(70.4)	7(16.6)

tumours, respectively. Of patients with grade II bladder tumour, 8(13%) and of those with grade III, 28 (32.1%) had prostate involvement by TCC (Table 2). The prostate involvement by TCC had direct relationship with the grade of the bladder tumour (P = 0.008; 95% CI=0.12-0.83; odds ratio = 0.32). Mean age of the patients with prostate TCC was 62 ± 8.6 years and for the patients with adenocarcinoma it was 63.7 ± 9.5 years. Gleason scores of the prostatic

Table 2: Prevalence of prostate adenocarcinoma (%) in different grades of bladder TCC.

Grade	Patients no	Prostate adenocarcinoma
I	0	-
II	60	8 (13)
III	87	28 (32.1)

TCC, Transitional cell carcinoma

adenocarcinoma were 3, 4, 5 and 6 in 1, 3, 9 and 6 patients respectively. Stage of prostate adenocarcinoma was determined in 10 patients which were 20% in each stage of T1, T2a, T2b, and 40% in stage T2c.

Discussion

The incidence of prostate cancer (Pca) varies considerably across population. The highest reported incidence of prostate cancer in the world is in Jamaica. The average age adjusted incidence of-prostate cancer in Kingston, Jamaica is 304 per 100.000 men.[12] In Asian countries particularly in China, the incidence of prostate cancer is low.

In a mass screening of prostate cancer in Changchun City of China, 4218 men over 50 years old were screened Subjects, whose serum PSA concentration was more than 4.1 ng/ml, were recommended to undergo transrectal ultrasound-guided systematic six-sextant biopsy of prostate. Cancer detection rate and age-adjusted cancer detect rate was 0.74% and 0.78%, respectively.[13] In a report from USA (Los Angeles county), the incidence rate was highest in African Americans (116 per men per year) and lowest among Asian (Japanese, 39 per 100 000 men per year and Chinese 28 per 100 000 men per year).[14] The significance of environmental factors in the development of Pca is apparent from studies in immigrants. Japanese

men have a low incidence of Pca in Japan. These rates are only one-fifteenth of those of white men in the United States, and they quadruple among first and second generation Japanese immigrants to the United States.[15] The reported rate of incidentally detected cancer is between 18%- 42%.[2,16] We found that 12.9% of cystoprostatectomy specimens in patients with bladder TCC also harbour incidental prostate cancer. This result was much lower than overall mean frequency of incidentally detected prostate cancer in other studies. Also, much lower than the age adjusted frequency of autopsy detected prostate cancer. Several studies have examined the prevalence of latent or occult prostate cancer detected only at autopsy and estimated it to be about 25% to 30%.[17]

In this study, the prostate involvement by TCC had direct correlation with the grade and stage of the bladder tumour. This is in agreement with a study by Liedberg et al.[18] Reported rates of prostate involvement by TCC in some studies is completely high. The prevalence of incidental PCa and its precursor, high grade intraepithelial neoplasia (HGPIN) in an autopsy series from Hungarians was 38.8%.[19]

However, it is worthwhile to mention that, the thickness of the pathologic slices in our study were 10mm, versus 5mm in some other studies.[18] In a study by Plante et al.[20] (10mm slices) the prevalence of prostate adenocarcinoma was 17.8% but it was 45% in another study in which the pathologic slices had thicknesses of 2-34 mm.[21] This rate is 12.9% in our country which is probably due to the less frequency of prostate cancer in our region or taking the thicker 10mm pathologic sample cuts. In two large population based studies, the overall cancer detection rate for prostate cancer was 3.5% in Iran.[7,9] The interesting finding of this study is the lower frequency of prostate adenocarcinoma in lower stages of bladder TCC (9.5% in T1 vs. 16.6% in T4 stages which is possibly due to the concurrent oncogenes in the bladder and prostate.[20,21]

Conclusion

A review of the epidemiology of prostate cancer is really an outline of the questions that have not been answered about prostate cancer. The analysis of the results suggests that the frequency of prostate cancer in Iran is lower than in western countries. Further studies are warranted in order to better determine this issue.

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