Original Article

The study of the incidence of prostate cancer in transurethral resection of the prostate (TURP) specimens

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Abstract

Objective: To study the incidence of prostate cancer in TURP specimens in Phramongkutklao Hospital.

Material and Method: A retrospective database included TURP specimens (2008-2016) in Phramongkutklao Hospital. The pathologic reports from 1,494 patients were investigated. There were 293 patients who did not meet the inclusion criteria. The cohorts were categorized into 2 groups according to age: men ≤ 65 years (254 patients) and > 65 years (1001 patients).

Result: According to the final pathological report for TURP specimens, BPH was detected in1203 specimens (95.9%) BPH and prostate cancer in 51 specimens (4.1%). In men ≤ 65years with cancer, tumors were identified in 3.9% of specimens (T1a=10%, T1b=90%), and in men > 65 years in 4.1 % of specimens (T1a=22.5%, T1b=77.5%). Following the diagnosis in men ≤ 65years with cancer: 1/10 radical prostatectomy, 1/10 RT only, 3/10 ADT+RT, 5/10 ADT only and 1/10 brachytherapy. In men > 65 years with cancer, treatments were classified: 3/41 observation, 3/41 active surveillance, 1/41 RT only, 10/41 ADT+RT, 21/41 ADT only and 2/41 brachytherapy.

Conclusion: The incidence of incidental findings of prostate cancer in TURP is not uncommon in older patients. Our results suggest that careful investigations should be undertaken before surgery. In addition, prostatic specimens from TURP are essential and should be sent for pathological examination. Undiagnosed cancer may result from other procedures without tissue specimens, such as PVP, and finally loss of specimen for pathological examination.

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Introduction

Prostate cancer is the most common cancer in males and the second leading cause of death following lung cancer.[1] On autopsy, up to 60% of men 70 years old and 80% of those 80 years old are found to have the latent disease.[2] At 23 years of the follow-up period, men ≤ 65 years experience the greatest oncological benefit, with a reduction in overall mortality of 25.5%.[3]

Clinical T1 or incidental prostate cancer is defined as a tumor that is neither palpable nor visible by imaging. Clinical T1a and T1b prostate cancer are diagnosed at the time of transurethral resection of the prostate (TURP) for benign prostatic diseases. T1 is a disease that involves 5% or less of the resected tissue, whereas the T1b disease involves more than 5% of the resected tissue.[4]

The majority of cases of localized prostate cancer are diagnosed as an incidental finding during the examination of transurethral prostatectomy (TURP) specimens, but this is an uncommon presentation in recent series.[5] With the success of medical therapy for benign prostatic obstruction, the incidence of TURP has fallen dramatically. Moreover, those men who do fail to respond to medical therapy for BPH increasingly undergo energy-based treatments, such as laser or microwave therapy.

Historically, resected prostatic tissue was found to harbor previously unsuspected or occult malignancies in approximately 10-31% of cases.[6] Several recent studies have reported that cancers originating from the transitional zone have a more favorable prognosis than tumors that arise in the peripheral zone.[7] Despite this prevalence, oncological outcomes have been poorly studied, with only a small series suggesting favorable survival.[8]

Early diagnosis in men ≤ 65 years of age influences survival outcomes. There is an argument for the assessment of the entire specimen in men of this age group. These reasons suggest that early prostate cancer diagnosis and management is important in a younger population.

Material and Method

After obtaining Institutional Review Board (IRB) approval, a retrospective review was performed on all transurethral resections of the prostate which provided a tissue specimen between 2008 and 2016 in Phramongkutklao Hospital.

During this period, 1,494 men were identified as having undergone this procedure. This population was classified into 2 groups based on age; group 1 represented men ≤ 65 years and group 2 represented men > 65 years.

Pre-operative and post-operative data were collected from medical records, such as demographic data. Histopathological results, weight of tissue resected, and amount of tissue were analyzed. Follow-up data were collected in a similar method. Variables collected included: subsequent treatment options for the cancer group.

All specimens were analyzed by a pathologist according to the pathological process. The results of the pathological report were divided into 2 groups: benign causes such as BPH and prostatitis; malignancy was classified by Gleason score and prognostic grade groups.

Result

Of 1,494, 1,255 were recruited into the study. Two hundred and thirty-nine patients were excluded due to a prior diagnosis of prostate cancer, rising PSA level and having undergone other procedures. The targeted populations were categorized into 2 groups: group 1 ≤65 years (254 men) and group 2 >65 years (1,001 men). The demographic data are shown in Table 1.

According to the histopathological report of the TURP specimens, 1,203 (95.9%) patients had benign prostatic hyperplasia. Fifty-one (4.1%) patients were found to have prostate cancer on pathologic report. Ten patients (19.6%) had grade group 1, 8 patients (15.7%) had grade group 2, 7 patients (13.7%) had grade group 3, 3 patients (5.9%) had grade group 4, and 23 patients (45.1%) had grade group 5. Of these

51 patients, 10 patients had T1a disease and 40 had T1b disease. Further evaluations found that 23 patients (45.1%) had metastatic disease while 28 patients (54.9%) had no metastasis as shown in Table 2.

Table 1. Baseline patient and disease characteristics.

Variable	Mean or number	Min	Max
Number (patients)	1,225		
Age (year)	73.25	46	96
Specimen weight (grams)	20.22	2	80
Operative time (minutes)	24.26	10	65
Indications			
Refractory urinary retention (%)	760 (60.6)		
Renal deterioration (%)	190 (15.1)		
Recurrent UTIs (%)	142 (11.3)		
Recurrent gross hematuria(%)	71 (5.7)		
Bladder stone or diverticulum (%)	92 (7.3)		

Table 2. Histopathological information.

Variable	N (%)
Benign prostate hyperplasia	1203 (95.3)
Prostate cancer	51 (4.1)
Prostate cancer grade group*	
1 (GS 3+3)	10 (19.6)
2 (GS 3+4)	8 (15.7)
3 (GS 4+3)	7 (13.7)
4 (GS 4+4, 3+5, or 5+3)	3 (5.9)
5 (GS = 9-10)	23 (45.1)
Clinical tumor staging **	
T1a	10 (20)
T1b	40 (80)
Metastasis	
Yes	23 (45.1)
No	28 (54.9)

* BJU International 2013;111:753-60

** American Joint Committee on Cancer. Staging, 2010

Three patients (5.9%) were managed with observation. Three patients (5.9%) underwent an active surveillance protocol. One patient (2%) underwent radical prostatectomy. Radiation therapy was performed in 2 patients (3.9%), and 13 men (25.5%) were treated with radiation therapy plus androgen deprivation therapy. Most of all, androgen deprivation therapy (51%) was selected for 26 patients as shown in Table 3.

For age group sub-categorization: prostate cancer was diagnosed in 10 men (3.9%) of the younger group and 41 men (4.1%) in the older group. Group 2 had a higher proportion of low-volume disease (pT1a), but metastasis was discovered to be higher in group 1. Within group1, a lower rate of low-grade prostate cancer was diagnosed (grade group 1) compared with the other group (10% vs 22% respectively).On the other hand, a higher rate of high-grade prostate cancer (grade group 5) was found in the older group compared with the younger group (73.9% vs 60%) as shown in Table 4. The outcomes after initial management of the 2 groups are shown in Table 5.

Discussion

Despite urologists realizing that prostate cancer identified during TURP is an uncommon presentation, the literature has not considered the reason for this finding. Clinical importance was divided in 2 parts. First, it is necessary to explain to patients about the risk of cancer detection from resected specimens after TURP.

Table 3. Management outcomes of prostate cancer group.

Treatment options	N (%)
Observation	3 (5.9)
Active surveillance	3 (5.9)
Radical prostatectomy	1 (2)
Radiation therapy	3 (9)
Radiation + hormonal therapy	13 (25.5)
hormonal therapy	26 (51)

Prostate cancer is usually located at the peripheral zone of the prostate. Recent studies suggest that isolated transition zone tumors occur only in 2% to 7% of cancers.[9] In addition, transition zone tumors tend to correspond with a more favorable oncological outcome, including lower Gleason scores, rates of EPE and risk of biochemical recurrence.[10] Prior to our report, the detection rate was 4.8% to 16.7%.[11] Voigt et al. found an incidental prostate cancer rate of 11.1% in their study to identify the risk factors of having clinically relevant prostate cancer discovered incidentally. In their series, 3.4% of patients had clinically relevant prostate cancer, pT1b, or a Gleason score of 7-10.[12] Trpkov et al. have reported the highest incidental prostate cancer rate, 16.7%; however, their study included patients with known prostate cancer.[13] Dellavedova et al. found an incidental prostate cancer detection rate of 7% when they reviewed 100 patients who underwent bipolar TURP[14]. Six patients had Gleason score 3 + 3 pT1a disease and one patient had Gleason score 3 + 4 pT1b disease.

The natural history of incidental prostate cancer has been studied. Earlier studies showed that T1a lesions were usually less aggressive than T1b lesions.[15] Descazeaud, et al. found that there are 5 parameters for predicting cancer progression in T1a patients. These parameters include preoperative and postoperative PSA, prostate weight, weight of resected tissue, and Gleason score.[16] But Melchior and colleagues concluded that there is no possibility to reliably predict the absence of aggressive prostate cancer after TURP, and thus safely recommend observation instead of further therapy.[17]

Table 4. Histopathological information classified by age group.

Variable	Group 1a N (%)	Group 2b N (%)	P value
Benign prostate hyperplasia	243 (95.7)	960 (95.9)	
Prostate cancer	10 (3.9)	41 (4.1)	0.138
Prostate cancer grade group*			0.743
1 (GS 3+3)	1 (10)	9 (22)	
2 (GS 3+4)	1 (10)	7 (17.1)	
3 (GS 4+3)	2 (20)	5 (12.5)	
4 (GS 4+4, 3+5, or 5+3)	0 (0)	3 (7.3)	
5 (GS = 9-10)	6 (60)	17 (73.9)	
Clinical tumor staging **			0.377
T1a	1 (10)	9 (22.5)	
T1b	9 (90)	31 (77.5)	
Metastasis			0.236
Yes	5 (50)	18 (43.9)	
No	5 (50)	23 (56.1)	

* BJU International 2013;111:753-60

** American Joint Committee on Cancer. Staging, 2010

a: age ≤65 year olds

b: age >65 year olds

Table 5. Management outcomes of prostate cancer group classified by age group.

Treatment options	Group 1[a] N (%)	Group 2[b] N (%)	P value
			0.316
Observation	0 (0)	3 (7.5)	
Active surveillance	0 (0)	3 (7.5)	
Radical prostatectomy	1 (9.1)	0 (0)	
Radiation therapy	2 (18.2)	3 (7.5)	
Radiation + hormonal therapy	3 (27.3)	10 (25)	
hormonal therapy	5 (45.5)	21 (52.5)	

a: age ≤65 year olds

b: age >65 year olds

In our study, we focused on the incidence of incidental prostate cancer detection in the current clinical setting in our hospital. The incidence of prostate cancer is 4.1%. This detection rate is similar to several other recently published series. However, there are some different points. High-grade prostate cancer had a higher detection rate (grade group 3, 4, 5: 13.7%, 5.9% and 45.1%, respectively). This histopathological report is in contrast with the previous series. Surprisingly, grade group 5 (Gleason score 9-10) prostate cancer is the highest proportion. The reasons for detecting high-grade prostate cancer are race and environment. In a multi-center review from 11 centers in Korea conducted by Yoo and colleagues, incidental prostate cancer was detected in 4.8% (78 of 1,613) of the patients who underwent surgical treatment for BPH, and more than half of them showed clinically significant prostate cancer.[18] Varghese, et al. showed that the detection rate of high-grade prostate cancer in India was 50%.[19] These studies emphasize the increasing detection rate of high-grade prostate cancer.

For subgroup analysis classified by age, our study found no significant difference in prevalence of incidental prostate cancer between the 2 groups: age ≤65 years and >65 years (3.9% vs 4.1%, p-value 0.138). Furthermore, the histopathological report is not different from the overall age group. There were high-grade tumors, especially grade group 5 in both groups (60% and 73.9% p-value 0.743, respectively). But metastasis and cT1b were identified in the younger age group compared with group 2 (50% vs 43.9% in metastasis, p-value 0.236 and 90% vs 77.5% in cT1b, p-value 0.377, respectively).

There are a variety of treatment options for prostate cancer, such as surgery, radiation therapy, hormonal therapy and combination therapy. However, the data on management for incidental prostate cancer is limited. The AUA guidelines do not specifically address the management of T1a or T1b lesions. The EAU recommends active surveillance or watchful waiting for patients with T1a tumors and patients with T1b tumors if the Gleason score is 6 or less and the life expectancy of the patient is less than 10 years. For patients with T1b tumors and a life expectancy of more than 10 years, radical prostatectomy is recommended. The patients in our study were not managed according to the EAU guidelines. Most of the patients underwent only hormonal therapy (52%); 26% of patients received combination hormonal and radiation therapy. Only 2% underwent radical prostatectomy. For subgroup analysis, only hormonal therapy was selected for the 2 groups (45.5% vs 52, 5%, respectively). The patients in our study were managed in accordance with the prior histopathological report.

Our study results are not the same as the previous literature. There are 3 reasons. First, race and environment may be correlated with prostate cancer histology. According to some studies from Asia, patients have high-grade prostate cancer. Most of the patients are advanced in age (mean 73.25 years old) and did not undergo prior prostate cancer screening. But, JS Jones and colleagues found that the risk of finding a previously unrecognized cancer was similar in men whether screening and/or biopsy had occurred or not.[20] The last reason: the regimen of screening for prostate cancer is different in Asia, Europe, and the USA.

This study has several limitations. It was a retrospective single-center study. Crucial clinical details were not available for the analysis of all patients including PSA and DRE findings, and previous medical history.

Conclusion

We demonstrated an incidental prostate cancer rate of 4.1%. Prostate cancer is not uncommon in TURP specimens. Many of these cancers are clinically significant, requiring further management. Patients who are candidates for laser vaporization or transurethral incision of the prostate should be

informed about this risk. This may lead to an under-identification of cancer. Furthermore, 64.7% of these patients have a high-grade tumor (more than grade group 3) which may affect the poor prognosis of these patients.

Conflict of interest

The authors report no conflicts of interest in this work.

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