

East African Medical Journal Vol. 84 No. 8 August 2007

HISTOLOGY OF SPECIMENS TAKEN BY PROSTATECTOMY AND NEEDLE BIOPSY

P.M. Ngugi, MBChB, MMed (Surg), FCS, ECSA, CEA Urology (Royal Coll. Surg. Engl), Senior Lecturer, Department of Surgery, College of Health Sciences, University of Nairobi, P.O. Box 19786-00202, Nairobi, Kenya and B. Byakika, MBBS, MMed (Path), Head of Pathology, The Nairobi Hospital, P.O. Box 30026, Nairobi, Kenya

Request for reprints to: Dr. P.M. Ngugi, Department of Surgery, College of Health Sciences, University of Nairobi, P.O. Box 19786-00202, Nairobi, Kenya

HISTOLOGY OF SPECIMENS TAKEN BY PROSTATECTOMY AND NEEDLE BIOPSY

P.M. NGUGI and B. BYAKIKA

ABSTRACT

Objectives: To determine the histology of the prostate in prostatectomy done for benign prostatic hypertrophy (BPH), and prostate needle biopsy done for raised prostatic specific antigen (PSA).

Design: A retrospective study.

Settings: Nairobi Hospital, Kenyatta National Hospital and Upper Hill Medical Centre.

Subjects: The records of all the patients who had prostatectomy for BPH or trans-rectal needle biopsy of the prostate for raised prostatic specific antigen by the author and whose histology was determined at the Nairobi Hospital between May 2004 and December 2006.

Results: A total of 108 specimens from 108 patients were sent to the laboratory. The ages of the patients ranged from 48 years to 83 years with a mean of 71.3 years. Of the 108 specimens submitted 82 were benign prostatic hypertrophy and 26 were carcinoma of the prostate. Out of 78 prostatectomy specimens ten (12.8%) had prostate cancer. In the needle biopsy group 16 out of 30 (53%) had prostate cancer. In total there were 82 (76%) patients with histology of benign prostate enlargement and 26 (24%) with histology of prostate cancer.

Conclusion: Prostate cancer is a common disease in Kenya and a lot of it is important cancer as it will progress and cause death. In this poor resource setting it is possible to make diagnosis of prostate cancer even in the absence of transrectal ultrasound (TRUS) to help biopsy the prostate. The higher the prostatic specific antigen in asymptomatic patients the higher the yield of prostate cancer on biopsy of the prostate.

INTRODUCTION

The diagnosis of prostate cancer in Kenya has been increasing over the last few years partly because of increasing number of patients for whom histology has been sought. There has been a real increase in the incidence of prostate cancer that predates the advent of prostatic specific antigen (PSA) (1) in Europe and North America. While PSA testing is widespread there, the cost of this test makes it unavailable for the majority of men in Kenya. The rationale for testing is the observation that patients diagnosed earlier with prostate cancer have a better prognosis than those

diagnosed with advanced prostate cancer (2). No clear guidelines are available in many developing countries and certainly in Kenya, on which patients need PSA testing and what the yield of such testing would be. Needle biopsy for prostate cancer in PSA screening have yields of 20-40% but no tests have been done in Kenya to look at the yield of PSA testing.

In Kenya, diagnosis of prostate cancer follows either prostatectomy (TURP or open) and subsequent histology of the specimen submitted or measurement of PSA followed by needle biopsy. Stepwise histology section examination is undertaken on the specimen submitted. At the time of biopsy the needle is usually

targeted at areas most likely to contain tumour, rather than a specific lesion (3). A trans-rectal ultrasound probe should be used to map the areas of the prostate from which the biopsy will be taken.

Prostatic specific antigen is the most frequently used and most important tumour marker in the diagnosis of prostate cancer. It is secreted by both the benign and malignant prostatic epithelium. The levels of the PSA depend on the prostate volume as well as the histology (4). A high PSA is a good indicator of the possibility of prostate cancer but is not diagnostic of cancer as there are other causes of a raised PSA.

The treatment of prostate cancer depends on the stage at presentation as well as the grade of the tumour. Metastatic prostate cancer is best treated by way of hormonal manipulation as first reported by Huggins in 1941 (5). Early prostate cancer is treated by way of radical prostatectomy, radical radiotherapy or a combination of radiotherapy surgery and hormonal treatment. Multimodal treatment is given for those patients with a relatively long life expectancy (10 years) with high risk disease as defined as a cancer though organ confined will not be cured by monotherapy whether surgery or radiotherapy.

The diagnosis of prostate cancer has been increasing worldwide. In the United Kingdom it is the most common diagnosed malignancy in the male (6). It is possible that prostate cancer too is the most common diagnosed malignancy in Kenya but no study to that effect has been conducted. A retrospective study was done in preparation for a bigger prospective study to look at the histology of prostate cancer in Kenya.

MATERIALS AND METHODS

A retrospective study was conducted by looking at the histology reports in the files of patients who had undergone prostatectomy (TURP or open prostatectomy) or needle biopsy and specimens submitted for histology to the Nairobi Hospital laboratory.

Prostatectomy was done by either TURP or Open (Millin's). For those who had transrectal needle biopsy of the prostate, twelve multiple needle biopsies of the prostate were done on those patients with a raised PSA (>4 ngs/ml) that had not resolved with antibiotics if they had a normal prostatic ultrasound or an abnormal prostate on digital rectal

examination or ultrasound. The biopsies were not done with ultrasound guidance. The indication for prostatectomy was a diagnosis of BPH with intractable lower urinary tract symptoms (LUTS) or retention of urine with failure of trial without catheter or upper tract damage. Upper tract damage was diagnosed by way of ultrasound of the urinary tract or raised urea and creatinine that improved with continuous drainage of the bladder with a catheter.

Consecutive patients derived from the Kenyatta National Hospital private wing and the Nairobi Hospital wards for those who had prostatectomy, and the Upper Hill Medical Centre and the Nairobi Hospital day care units for those who had trans-rectal needle biopsy had the histology of their prostate determined at the Nairobi Hospital laboratory. All such specimens of the prostate were sent by the author to the pathology department of the Nairobi Hospital from May 2004 to December 2006, a period of approximately two and a half years.

The study included all patients for whom a specimen had been submitted for histology either after prostatectomy or needle biopsy.

RESULTS

Over the study period 108 specimens were sent from 108 patients (Table 1). Among these specimens were 78 from prostatectomies and 30 needle biopsies. The ages of the patients ranged from 48 years to 83 years with a mean of 71.3 years. Out of 78 prostatectomy specimens ten (12.8%) had prostate cancer and 68 had benign prostate enlargement. In the needle biopsy group 16 out of 30 (53%) had prostate cancer and 14 had benign prostate enlargement. In total there were 82 (76%) patients with histology of benign prostate enlargement and 26 (24%) with histology of prostate cancer.

Prostate cancer was found in ten (14.7%) out of 68 patients who had prostatectomy where pre-operative investigations had shown the prostate to be benign.

Prostate cancer was found in 16 out of 30 patients (53%) who had needle prostate biopsy for raised PSA (Table 2). Eight of these patients had a PSA of six to ten, of whom two had prostate cancer and six did not have cancer. Twenty two patients had a PSA of one to 20, of whom 14 had prostate cancer and eight did not have prostate cancer. The higher the PSA the higher the yield of prostate cancer.

Table 1*Histology outcome for prostate specimens*

	Benign enlargement	Prostate cancer	Total
TURP or open prostatectomy	68	10	78
Needle biopsy	14	16	30
Total	82	26	108

Table 2*PSA and results of the biopsy*

PSA	+ve biopsy	-ve biopsy	Total
PSA 6-10	2	6	8
PSA 11-20	14	8	22
Total	16	14	30

There were six out of 28 (21%) patients with prostate cancer who had low grade prostate cancer Gleason less than six. Of those patients with prostate cancer 16 out of 26 (62%) had medium grade (Gleason 6-8) cancer and four out of 26 (15%) had high grade cancer Gleason (9-10). In those with prostate cancer six had low grade cancer and therefore required no intervention, 16 had medium grade cancer and would be the best beneficiaries of early treatment for prostate cancer and four had high grade cancer and therefore had the highest need for early intervention (Table 3).

Table 3*Prostate cancer and Gleason score*

Type of prostate cancer	<Gleason 6	(Gleason 6-8)	High grade Gleason 9 and 10	Total
No. of patients	6	16	4	26

DISCUSSION

The study shows that prostate cancer is a common disease in Kenya and that a significant number of patients being treated for benign disease (14%) would be having prostate cancer. This has serious implications on the treatment of patients with BPH

symptoms with non-surgical means. A prospective study to verify this data will be undertaken. The evaluation of patients with BPH for prostate cancer needs to be as exhaustive as possible and must include DRE, ultrasound (preferably TRUS) and PSA. This will necessarily mean screening for prostate cancer in patients with symptomatic BPH. This would result in diagnosis patients with early prostate cancer of the prostate who may need and will demand treatment. This will create a need to treat patients with early prostate cancer which at the moment is not widely available in Kenya.

Needle biopsy of the prostate is best done under ultrasound guidance for best results. This study showed that needle biopsy of the prostate in the absence of trans-rectal ultrasound is still a useful way of taking biopsies of the prostate with 53% of the patients with a raised PSA having had prostate cancer diagnosis made this way. In a poor resource setting multiple biopsies of the prostate has a good probability of picking prostate cancer even if not done under ultrasound guidance.

A big proportion of the patients found to have prostate cancer in this study had cancer that would be clinically significant (> Gleason 5). Sixteen out of 28 patients (57%) with a diagnosis of prostate cancer had Gleason 7-8 prostate cancer. Four out of twenty eight patients with a diagnosis of prostate cancer had Gleason 9-10 tumours. This group of patients requires expedited treatment because of their high risk of metastasis and prostate cancer mortality. While screening of the population for prostate cancer is not advocated, taking of biopsies for all those with a raised PSA and presenting with LUTS is a useful way of diagnosing those with a prostate cancer at a stage where there is a possibility of cure.

In conclusion, prostate cancer is a common disease in Kenya and a lot of it is clinically important cancer. In this poor resource setting it is possible to make diagnosis of prostate cancer even in the absence of TRUS to biopsy the prostate. The higher the PSA in asymptomatic patients the higher the yield of prostate cancer in the biopsy of the prostate.

REFERENCES

1. Murphy J. and Whelan R.L. Changing trends in prostatic cancer. *Brit. J. Urol. Int.* 1999; **83**: 786-791.

2. Nam R.K., Toi A., *et al.* Variation in patterns of practice in diagnosing screen-detected prostate cancer. *Brit. J. Urol. Int.* 2004 ; **94**: 1239-1244.
3. Simon R. and Bott J. Can prostate cancer targets be achieved? *Brit. J. Urol. Int.* 1998; **5**: 939.
4. Lynn N.N.K., Collins G.N. and O'Reilly P.H. The short-term prostate specific antigen velocity before biopsy can be used to predict prostatic histology. *Brit. J. Urol. Int.* 2000; **85**: 847-850.
5. Huggins C.H. Studies on prostate cancer: The effect of castration, of oestrogen and of androgen injection on serum phosphatases in metastatic carcinoma of the prostate. *J. Urol.* 2002; **167**: 948-951.
6. Leonard G. and Gomella M.D. Global update on the use of hormonal therapy for the management of high-risk prostate cancer: Introduction. *Brit. J. Urol. Int.* 2007; **99(suppl 1)**: 1.