Original Article

Histopathological Spectrum of Prostatic Lesions in a Tertiary Care Hospital

Rahman MA[1], Siddika ST[2], Siddika SS[3], Shirin A[4], Parvin M[5]

ABSTRACT

Background: *Prostatic lesions like nodular hyperplasia, inflammation and carcinoma are common causes of morbidity and mortality in males. The incidence of these lesions increases with advancing age. Prostatic diseases show varying incidence in different geographical locations worldwide.*

Objectives: *To evaluate the histopathological spectrum of various prostatic lesions in biopsy specimen.*

Methods: *This was a retrospective study comprising 220 cases, carried out at the Department of Pathology, Enam Medical College and Hospital from January 2014 to December 2020. The histopathological slides were analyzed according to type of specimen, age of the patient, and histopathological pattern. Adenocarcinomas were graded according to Gleason score.*

Results: *Of the total 220 specimens, 202 (91.8%) were of nodular hyperplasia, 14 (6.4%) were carcinoma and 4 (1.8%) cases were high grade prostatic intraepithelial neoplasia (HGPIN). All the cases of prostatic malignancies were adenocarcinoma and majority were belonged to Gleason's score 7. Maximum numbers of cases of nodular hyperplasia were seen in the 61-70 years age group and carcinomas were peak in the 71-80 years age group.*

Conclusion: *Non-neoplastic lesions of the prostate are more common than neoplastic ones. Histopathological diagnosis and grading plays a definitive role in the management of prostatic carcinoma.*

Keywords: *Nodular hyperplasia, Adenocarcinoma, High grade prostatic intraepithelial neoplasia (HGPIN), Gleason score*

Mugda Med Coll J. 2023; 6(1): 5-10

INTRODUCTION

The prostate is a retroperitoneal organ encircling the neck of the bladder and urethra. It is histologically composed of glands and fibromuscular stroma. Prostate is one of the most commonly affected organs in males with increasing age, accounting for significant morbidity and mortality. Most of the patients present with complaints related to micturition and incontinence. The most important categories of prostatic diseases are inflammatory lesions (prostatitis), nodular hyperplasia, and carcinoma. Most hyperplasia arises in the transitional zone of the prostate whereas carcinoma originates in the peripheral zone. Nodular hyperplasia is the most common benign prostatic disease in men older than age 50 years. Approximately 30% of white American men in that age group have moderate to severe symptoms, and histological evidence of nodular hyperplasia is found in up to 90% of men by age 80.[1] It is not a premalignant lesion. Prostatitis may be divided into several categories, depending on cause,

1. Dr. Md. Atiqur Rahman, Professor, Department of Pathology, Enam Medical College, Savar, Dhaka, mdatiq07@ gmail.com.
2. Dr. Syeda Tasfia Siddika, Assistant Professor, Department of Physiology, Mugda Medical College, Dhaka
3. Dr. Syeda Subrina Siddika, Lecturer, Department of Community Medicine, Mugda Medical College, Dhaka
4. Dr. Afroz Shirin, Assistant Professor, Department of Pathology, Enam Medical College, Savar, Dhaka
5. Dr. Maksuda Parvin, Assistant Professor, Department of Pathology, Enam Medical College, Savar, Dhaka

Address of correspondence: Dr. Md. Atiqur Rahman, Professor, Department of Pathology, Enam Medical College, Savar, Dhaka, mdatiq07@gmail.com.

patterns of tissue reaction, and clinical course. These are acute bacterial prostatitis, chronic bacterial prostatitis, chronic abacterial prostatitis and granulomatous prostatitis.[1]

Prostate cancer is the second most common cause of cancer-related death in men older than 50 years, surpassed only by lung cancer. Almost 75% of the men diagnosed with prostatic cancer are age 65 or older. The age-adjusted incidence is on the increase in most countries. There are some national and racial differences in the incidence of the disease. Among the prostatic malignancies, adenocarcinoma is the most common.[2]

Screening of prostatic lesions constitutes estimation of serum prostate specific antigen (PSA), digital rectal examination, and transrectal ultrasound, but histopathology remains the gold standard tool for final diagnosis. Transurethral resection of prostate (TURP) is most frequently performed surgical procedure in the clinical practice and it aids in early identification of premalignant lesions and incidental prostate cancer which can improve the treatment outcome of patients.[3] The aim of this study was to review the spectrum of prostate lesions diagnosed on histopathology.

MATERIALS AND METHODS

This was a retrospective study comprising 220 cases, carried out at the Department of Pathology, Enam Medical College and Hospital from January 2014 to December 2020. The data were collected retrospectively from histopathology register. The gross specimens received were transurethral resections of prostate (TURP), tru cut biopsies and prostatectomies. Inadequate biopsy, poorly preserved specimens and patients previously diagnosed to have malignancy on histology were excluded from the study. All relevant clinical details were obtained from the respective requisition forms submitted in the pathology department. The histopathological slides were analyzed according to type of specimen, age of the patient, and histopathological pattern. Adenocarcinomas were classified according to the Gleason grading system. Data were analyzed using tables and percentage.

RESULTS

A total of 220 prostate specimens were received from January 2014 to December 2020. The specimens included 197 (89.5%) TURP chips, 17 (7.7%) TRUS guided needle biopsies and 6 (2.8%) prostatectomy specimens (Table-I). Grossly, the TURP specimens were in the form of multiple pieces ranging from 3 to 12 cc in volume, gray tan in color and soft to firm in consistency. The needle biopsy specimens were in the form of elongated pieces of gray tan tissues ranging from 0.4-1.2 cm in size. The prostatectomy specimens were nodular and varied from 3-10 cm in size. The consistency varied from soft to firm to hard.

In the present study, most of the prostatic lesions were benign (202, 91.8%), followed by malignant (14, 6.4%) and HGPIN (4, 1.8%); ratio of benign and malignant lesions 14.4:1.The age of the patients ranged from 45 to 100 years (Table-II). Majority of the benign lesions were common in the age group of 61-70 years (43.6%), followed by 71-80 age group (21.8%). Mean age for benign lesions was 67.3 years (Age range 47-100 years). Malignant lesions were common in the age group 71-80 years (42.9%), followed by 61-70 age group (28.4%). The mean age for malignant lesions was 68.6 years (Age range 45-87 years).

Nodular hyperplasia of prostate was the most frequent histopathological diagnosis seen in 202 (91.8%) patients (Table-III and Figure 1).Nodular hyperplasia had associated prostatitis were in 42 (19.1%) cases, out of which 38 cases were chronic non-specific prostatitis and four cases were acute prostatitis. Granulomatous prostatitis was not found. Microscopic findings associated with nodular hyperplasia of the prostate comprised hyperplasia of both epithelial and stromal cells with cystically dilated glands and corpora amylacea. Nodular hyperplasia was associated with squamous metaplasia in 4 (1.8%) cases and basal cell hyperplasia in 2 (0.9%) cases.

Table-I: *Distribution of histopathological lesions & nature of specimens*

Nature of specimen	Nodular hyperplasia	HGPIN	Malignant	Total (%)
TURP	193	2	2	197 (89.5)
Needle biopsy	4	1	12	17 (7.7)
Prostatectomy	5	1		6 (2.8)
Total	202	4	14	220 (100)

Table-II: *Distribution of cases according to age*

Age (Years)	Nodular hyperplasia (%)	HGPIN (%)	Malignant (%)	Total (%)
<50	11 (5.4)		1 (7.1)	12 (%)
51-60	43 (21.3)	1 (25)	2 (14.2)	46(%)
61-70	88 (43.6)	2 (50)	4 (28.4)	94(%)
71-80	44 (21.8)	1 (25)	6 (42.9)	51(%)
>81	16 (7.9)		1 (7.1)	17(%)
Total	202 (91.8%)	4 (1.8%)	14 (6.4%)	220 (100)

Table-III: *Histopathological profile of prostatic lesions*

Prostate pathology		Subtypes	Frequency	Total (%)
Nodular hyperplasia	Without prostatitis	160	72.7	
(n=202)	With prostatitis (n=42)	Chronic prostatitis	38	17.3
		Acute prostatitis	4	1.8
HGPIN			4	1.8
Carcinoma of prostate			14	6.4
Total			220	100

Table-IV: *Pattern of Gleason score in adenocarcinoma*

Prostate Cancer Gleason Grade Groups	Gleason score	Primary+ Secondary	Total (%)
Grade group 1(≤6)	Score 5	3+2	1
	Score 6	3+3	2
Grade group 2 (3+4)	Score 7	3+4	6
Grade group 3 (4+3)		4+3	
Grade group 4 (4+4/ 3+5/5+3)	Score 8	4+4	4
		5+3	
Grade group 5 (4+5/5+4/5+5)	Score 9	5+4	1

All the malignant lesions were adenocarcinomas. Moderately differentiated carcinomas (Gleason score 5-7) comprised the largest group with 9 cases (64.3%), and remaining cases are poorly differentiated carcinomas (Gleason score 8-10) with 5 cases (35.7%). The most common predominant tumor pattern i.e. primary pattern score was 3 and the most common secondary pattern score was 4 (Table-IV and Figure 2).

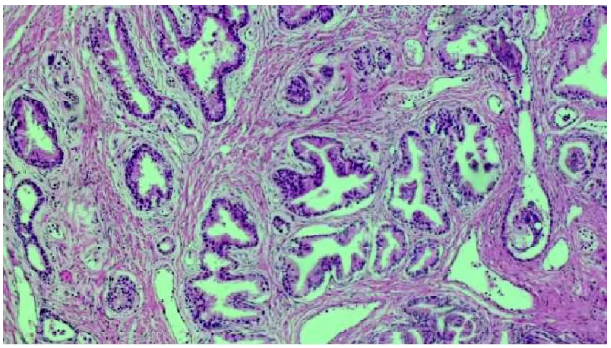

Figure 1: *Nodular hyperplasia: glandular and stromal proliferation. (H&E; X100)*

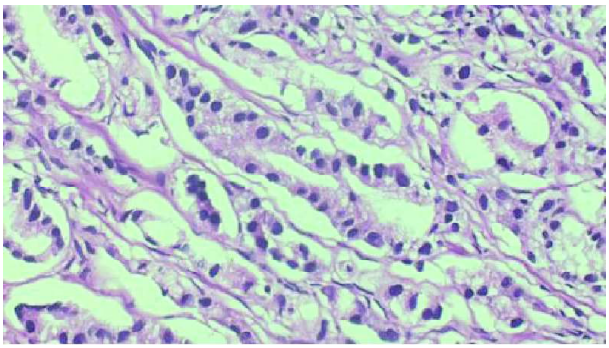

Figure 2: *Adenocarcinoma of prostate. (H&E; X400*)

DISCUSSION

Prostate diseases are common in the elderly age group. Prostate hyperplasia and malignancy are increasingly frequent with advancing age. In our study, most of the specimens received were TURP (89.5%), which was similar to other studies.[4,5] Nowadays, TURP is a preferred surgery for nodular hyperplasia of prostate as it is a simple procedure with fewer complications. However, a study conducted by Deshmukh et al had a higher percentage of prostatectomy specimens (94.7%).[6] This may be due to the different protocols used for the diagnosis and treatment of patients with lesions of the prostate.

In the present study, most of the prostatic lesions were nodular hyperplasia (91.8%) followed by malignant (6.4%) and HGPIN (1.8%). These are comparable with other findings in the literature.[3-11] Ratio of benign and malignant lesions was 14.4:1 which is comparable with other findings,[3,4,6,10] but sharply contrasts with reports from different regions of Nigeria where the ratio is 3:1.[12,13] Nodular hyperplasia as the dominant histological inference is similar to reports from various parts of the world. In Nepal, nodular hyperplasia was 89.58%[4], 91% in India[7], 87.5% in Pakistan[8], 80.3% in Saudi Arabia[9], 75.9% in Nigeria[12] and from Bangladesh 89.32%[10] and 77.4% [11].

Nodular hyperplasia without prostatitis was seen in 160 cases (72.7%) and prostatitis with nodular hyperplasia was seen in 42 cases (19.1%). Chronic non-specific inflammation was seen in the majority of the cases of nodular hyperplasia with prostatitis (17.3%). Acute inflammation was seen in 1.8% cases. No case of granulomatous prostatitis was found in our study. Abubakar et al[12], Sultana et al[10] and Deshmukh et al[6] have reported chronic prostatitis associated with nodular hyperplasia in 6.9%, 16.3% and 25% cases respectively. Sharma et al[7] found prostatitis in 33.06% cases of Nodular hyperplasia of prostate out of which 86.42% cases were chronic non-specific prostatitis, 9.88% were acute prostatitis and 3.7% were granulomatous prostatitis. These variations could be due to varied conclusion criteria used by assessors and can be in up to 98% of prostate specimens.[13] In the present study, nodular hyperplasia was associated with squamous metaplasia in 4 (1.8%) cases and basal cell hyperplasia in 2 (0.9%) cases. Metaplasia in nodular hyperplasia of the prostate is usually secondary to inflammation or injury. Garg et al[3] and Bhatta et al[4] observed squamous metaplasia in 0.8% and 1.04% cases respectively in their studies. These figures are little when matched with reports by Puttaswamy et al[5], which reported that metaplasia accounted for 22% of cases with nodular hyperplasia. This could be because a smaller number of cases (total 62) were studied by these authors.

HGPIN is a precursor lesion of prostate cancer. In our study, 4 cases (1.8%) of HGPIN were encountered. Similar studies of Sultana et al[10] and Bhatta et al[4] found HGPIN in 1.12% and 2.08% respectively. The incidence of HGPIN is relatively low in cases of prostatic carcinoma because most of the specimens were TURP which does not have enough material compared to radical prostatectomy which was studied in other studies.[14]

Prostate cancer is one of the most common malignancies in the world. More than 75% cases of all prostate cancers occur in males more than 60 years of age.[2] In present study, prostate cancer was found to be affecting 14 (6.4%) cases of all prostatic specimens. With similar studies, Sharma et al[7] found prostate cancer in 3.26% cases, Sultana et al[10] 9%, Puttaswamy et al[5] 17% and Abubakar et al[12] in 23.5% cases. Thus, there is significant variation as to the reported frequency of malignancies. In the current study, all the malignant lesions were adenocarcinoma. Different studies also found adenocarcinoma as the principal variant of prostate cancer, constituting more than 90% of all prostate cancer cases.[5,7,12] No other subtype of prostatic carcinoma was identified in our study. However, a study by Abubakar et al[12] reported

adenocarcinoma in 93.7% and incidence of urothelial carcinoma, squamous cell carcinoma and metastatic tumor in less than 7%. The prevalence of prostate cancer was highest in specimens from 71-80 year age group in agreement with other studies.[4-6,9,10] However, studies from African countries recorded peak age of prostate cancer in 7th decade of life.[12,16] A consideration of the life expectancy of these populations may explain the variations observed, since only a small proportion of Africans live beyond the seventh decade in contrast to the developed countries and other parts of the world where a longer life expectancy is observed.[12]

Adenocarcinomas were graded according to the Gleason system. It is based on the degree of glandular architectural differentiation and the growth pattern of the tumor in relation to the stroma as evaluated on low-power examination.[2] Gleason grading showed that moderately differentiated carcinomas (Gleason score 5-7) comprised the largest group (64.3%) which was also found by other studies.[9,10,17] Abubakar et al[12] (47.9%), Bhatta et al[4] (62.5%) and Deshmukh et al[6] (66.7%) found most of the prostate cancer specimens were poorly differentiated tumors. A predominance of well-differentiated tumors was noted by Mohammed et al[16] (86.8%) and Elem and Patil[18]. In the present study, no case of low-grade adenocarcinoma was detected probably as these lesions were asymptomatic. We found a maximum number of cases (50%) showing predominant pattern 3, which was comparable with other study.[6] Gleason score 7 was the commonest combined pattern seen in 42.9% cases similar to Puttaswamy et al[5] and Sultana et al[10]. Talukder et al[11] identified the majority of cases (52.6%) with a Gleason score 6. According to studies of Bhatta et al[4] (37.5%), and Deshmukh et al[6] (33.3%), most prevalent Gleason score was 9. Abubakar et al[12] found 48% of adenocarcinomas with Gleason score 8-10. This discrepancy may be dependent on the total number of cases of adenocarcinoma observed or delayed presentation of the patients.

CONCLUSION

The most common pathology encountered in prostate specimens is nodular hyperplasia. All cases of prostate carcinoma were adenocarcinomas. Most of the nodular hyperplasia occurs in the age group 61-70 years and carcinomas in 71-80 years. Majority of the prostate malignancies are moderately differentiated carcinomas.

REFERENCES

1. Kumar V, Abbas A K, Fausto N, Aster JC. The lower urinary tract and male genital system. In: Robbins and Cotran pathologic basis of disease. 10th edn. Philadelphia: Elsevier; 2021: 953-984.
2. McKenney JK. Prostate and seminal vesicles. In: Rosai and Ackerman's surgical pathology. 11th edn. Philadelphia: Elsevier, 2018: 1097-1134.
3. Garg M, Kaur G, Malhotra V, Garg R. Histopathological spectrum of 364 prostatic specimens including immunohistochemistry with special reference to grey zone lesions. Prostate Intl 2013; 1(4): 146-151.
4. Bhatta S, Hirachan S. Prostatic lesions - histopathological study in a tertiary care hospital. JMMIHS 2018; 4(1): 12-19.
5. Puttaswamy K, Parthiban R, Shariff S. Histopathological study of prostatic biopsies in men with prostatism. J Med Sci Health 2016; 2(1): 11-17.
6. Deshmukh BD, Ramteerthakar AN, Sulhyan KR. Histopathological study of lesions of prostate - A five year study. Int J Health Sci Res 2014; 4(1): 1-9.
7. Sharma A, Sharma M, Gandhi S, Khajuria A, Goswami KC. Histomorphological spectrum of prostatic lesions: a retrospective analysis of transurethral resection of prostate specimens. Int J Res Med Sci.2017; 5(6): 2373-2378.
8. Aslam HM, Shahid N, Shaikh NA, Shaikh HA, Saleem S, Mughal A. Spectrum of prostatic lesions. Int Arch Med 2013; 6: 36-40.
9. Albasri A, El-Siddig A, Hussainy A, Mahrous M, Alhosaini AA, Alhujaily A. Histopathologic characterization of prostate diseases in Madinah, Saudi Arabia. Asian Pac J Cancer Prev 2014; 15(10): 4175-4179.
10. Sultana SS, Hossain S, Rahman A. Histopathological spectrum of prostatic lesions evaluated in a tertiary hospital. Journal of Histopathology and Cytopathology 2020; 4(1): 33-37.
11. Talukder SI, Roy MK, Azam MS, Huq MH, Haque MA, Saleh AF. Histopathological patterns of prostate specimens in Mymensingh. Dinajpur Med Col J 2008; 1(2): 29-32.
12. Abubakar A, Alhaji SA, Sanusi HM, Aliyu S, Musa MU, Abdullahi AS. Histopathological pattern of prostatic lesions in Kano, Northwestern Nigeria: A

14-year review. Ann Trop Pathol 2019; 10(2): 150-154.

13. Kohnen PW, Drach GW. Patterns of inflammation in prostatic hyperplasia - a histologic and bacteriologic study. J Urol 1979; 121(6): 755-760.
14. McNeal JE. Morphogenesis of prostatic carcinoma. Cancer 1965; 18(12): 1659-1666.
15. McDavid K, Lee J, Fulton JP, Tonita J, Thompson TD. Prostate cancer incidence and mortality rates and trends in the United States and Canada. Public Health Rep 2004; 119: 174-186.
16. Mohammed AZ, Nwana EJC, Anjorin AS. Histopathological pattern of prostatic diseases in Nigerians. African Journal of Urology 2005; 11(1): 33-38.
17. Rajani R, Mehta N and Goswami H. Histopathological study of prostatic lesions at tertiary care centre. International Journal of Clinical and Diagnostic Pathology 2020; 3(2): 172-176.
18. Elem B, Patil PS. Pattern of urological malignancy in Zambia - a hospital-based histopathological study. Br J Urol 1991; 67(1): 37-39.