ORIGINAL ARTICLE

Histopathological Spectrum of Lesions Observed in Prostate Specimens - An Institutional Experience

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Abstract

Background: Prostatic lesions account for the major afflictions in the geriatric population worldwide. Prostate specific antigen can be used for screening but histopathology remains the gold standard for differentiating benign and malignant prostatic enlargements and definite diagnosis. Furthermore, a precise pathologic evaluation of the prostatectomy specimen can provide additional prognostic factors including pathological stages and surgical margin status. **Methods:** A systematic search identified 306 prostatic specimens submitted in the department over a time period of three years (January 2019-December 2021). Relevant clinical data, PSA level and H&E stained sections were examined for microscopic details and diagnosis. **Results:** Benign Prostate Hypertrophy (BHP) was the most common prostatic lesion and accounted for 83% of all cases. The age range was 49 to 90 years with a peak age group between 6th-7th decade. BPH associated with prostatitis and basal cell hyperplasia was seen in 57.8% and 3.3% cases respectively. A single case of non-specific granulomatous prostatitis was seen. Malignant tumours constituted 15.7% of all prostatic specimen. Adenocarcinoma was the histopathological subtype in all primary tumours. A single case of metastatic deposits from bladder tumour was recorded. Gleason score 7 was the most frequent (38.2.8%) in occurrence. Most adenocarcinomas were moderately differentiated (55.3%). Prostate Intraepithelial neoplasia (pre malignant lesion) was seen in 1.3 % of cases. **Conclusion:** Benign Prostate lesions occur more frequently when compared to malignant ones. Major proportion of benign lesions was contributed by Benign prostate hypertrophy. A pathologist's awareness of the benign mimics is important for the diagnosis of Prostate carcinoma.

Keywords

Gleason score, Benign prostate hypertrophy, Prostatic Adenocarcinoma.

Introduction

Prostate cancer is the second leading malignancy (after lung cancer) in men worldwide. Based on GLOBOCAN 2018 estimates 1,276,106 new cases of prostate cancer were reported worldwide in 2018 accounting for 3.8% of all deaths caused by cancer in men.[1] BPH is nearly ubiquitous in the aging male.[2] Both BPH & Carcinoma of prostate present with obstructive urinary symptoms, respond to anti-androgen treatment regimen and displays a parallel increase in prevalence with patient's age. Patients who undergo needle core biopsies of the prostate for elevated prostate-specific antigen (PSA) levels show evidence of prostatitis on histology in approximately 27% of the cases. Chronic prostatitis involves peri glandular infiltration of lymphocytes, plasma cells and histiocytes along with interstitial fibrosis.[3] It is usually associated

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with nodular hyperplasia of prostate and occurs in approximately 10-15% of men. High grade prostatic intraepithelial neoplasia (HGPIN) is a premalignant condition of prostatic adenocarcinoma [4] Prostate cancer lends itself to chemoprevention owing to a number of characteristics specific to this disease including a high prevalence, long latency time, hormone dependency and the availability of an ideal marker (prostate specific antigen). Prostatic cancer progression occurs either by direct invasion, lymphatic or hematogenous spread. [5]

Materials and Methods:

After obtaining Institutional Ethical Committee approval (IEC/GMC/Cat C/2022/740 dated 03/01/2022). Data of all prostatic specimens including core needle biopsy, Transurethral resection of prostate (TURP) and prostatectomy specimens submitted to pathology department in 3 years (January 2019-December 2021) were retrieved retrospectively, and a concise clinical history was reviewed from the archival material in the pathology department. The lesions were classified as on basis of histomorphological findings. Data collected was entered and analysed using MS excel.

Results

The present study constituted a total of 306 cases. All prostatic specimens were broadly classified into benign and malignant. The age of the patients varied from 49 years to 90 years. Overall, the peak was seen at 61-70 years of age. The youngest patient in our study was diagnosed as Benign Prostate Hypertrophy. Median age at which diagnosis was made is 60 years for benign tumour, 69 years for malignant tumour.

Serum Prostate Specific antigen (PSA) levels were measured in 176 cases, of which 137 were benign and 39 were malignant. PSA levels > 15 ng/mL were seen in 5 benign cases (3.6%) and 36 malignant cases (92.3%). The most common diagnosed lesion was BPH comprising 254 cases and representing 83% of prostatic specimens whereas BPH (*Figure 1*) was associated with chronic prostatitis in 176 (69.3%) cases, basal cell hyperplasia in 10 (3.9%). A single case of non-specific granulomatous prostatitis was noted in the present study (*Figure 2*).

48 cases of malignant lesions were identified in the present study (*Table 1*) Only a single case was of metastatic deposits from bladder tumour. All cases (47) of prostatic carcinoma were adenocarcinoma (*Figure 3*) which exhibited different growth patterns and were categorized depending on the primary and secondary pattern. The microscopic grading system developed by Gleason in conjunction with the Veterans' Administration Cooperative Urological Research Group is currently preferred to the other grading systems that have been proposed over the years. It is based on the degree of glandular architectural differentiation and the growth pattern of the tumour in relation to the stroma as evaluated on low-power examination.

The predominant tumour pattern (referred to as "primary") is graded from 1 to 5, and the "secondary" pattern (if present) is graded similarly, with the two numbers being added to obtain the Gleason score or sum. If the tumour has the same pattern throughout (i.e it has only a "primary" pattern), the number is multiplied by 2 in order to obtain the final score. [6]

The majority of cases (*Table 2*) had Gleason score 7 (18/47, 32.3%) belonging to moderately (*Figure 4)* differentiated group (n=26, 55.3%), followed by poorly differentiated group (n=14, 29.8%) and well differentiated group (n=7, 14.9%).

Discussion

A total of 306 neoplastic prostate lesions were seen during three-year study period. In the index study, the age of the patients ranged from 49 years to 90 years; however, the predominant population was in the 6th to 7th decade. No significant difference was noted in the affected age group. The results of the present study agree with the studies by Garg M *et al.* [7] in which the mean age was 68.6, Anunobi CC *et al.* [8] in which the mean age was 67 years and by Barakzai *et al.* **[9]** in which the mean age was 66.9 years.

Benign lesions were found to be more common (254, 52.2%) than malignant tumours (48, 47.8%). In the study by Garg M et al. [7] 285 (78.35%) out of 364 lesions were benign and 79 (21.7%) were malignant. Anunobi

Table 1 Histopathological spectrum of prostate lesions in index study.

Histopatholoy diagnosis	Number of cases	Percentage
BPH	67	21.9%
BPH with prostatitis	176	57.5%
BPH with granulomatous prostatitis	1	0.3%
Basal cell hperplasia	10	3.3%
Prostatic intraepithelial neoplasia	4	1.3%
Prostatic Adenocarcinoma	47	15.4%
Metastatic deposit	1	0.3%
Total	306	100%

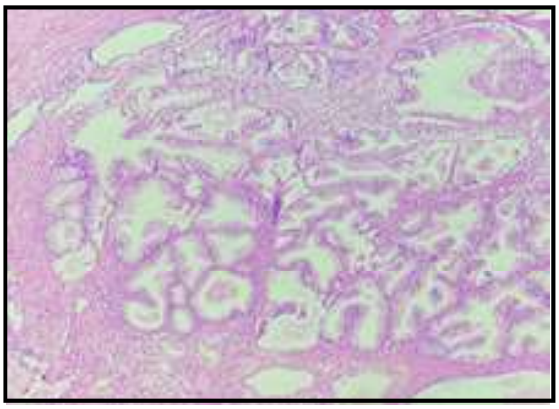

Fig. 1 Nodular hyperplasia of prostate on Transurethral resection prostate (H&E 100 X)

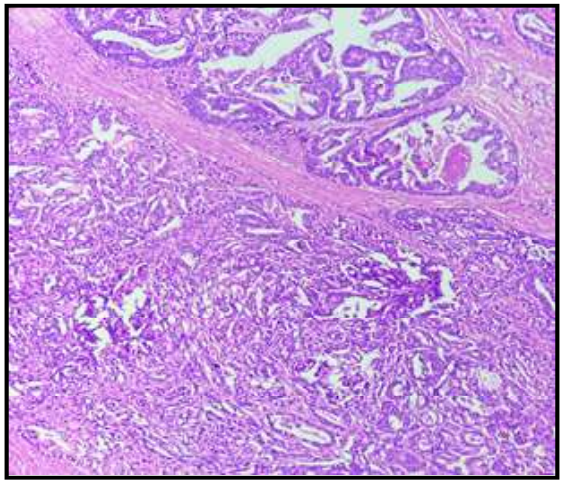

Fig. 3 Prostate Adenocarcinoma showing varying architectural pattern (H&E 100 X)

Table 2 Distributions of Gleason's scores of adenocarcinomas prostate/degree of differentiation

Differentiation	Gleason's score	No. of cases (%)
Well differentiated	2-4	7 (14.9%)
Moderately differentiated	5-7	26 (55.3%)
Poorly differentiated	8-10	14 (29.8%)
Total		47(100%)

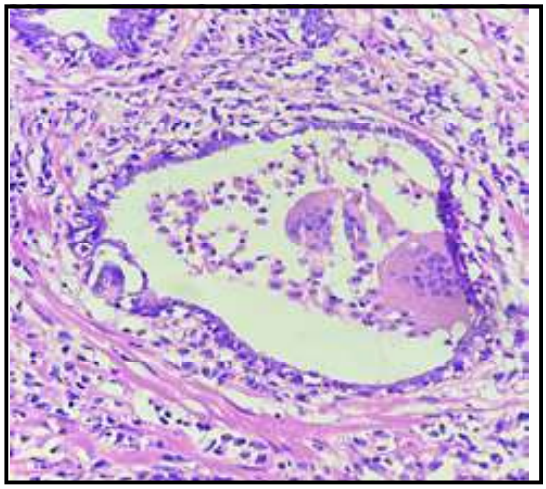

Fig. 2 Non-specific granulomatous prostatitis (H&E 400 X)

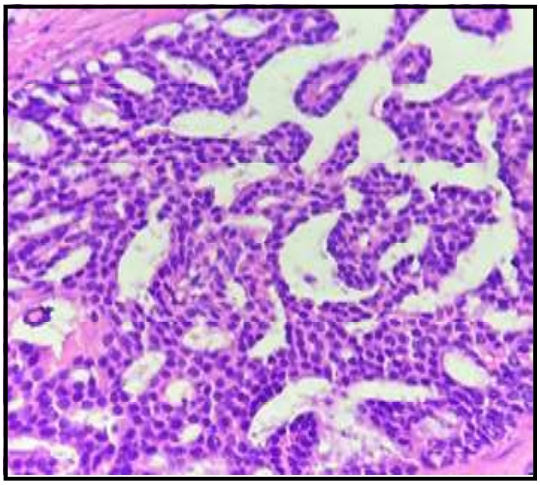

Fig. 4 Prostate adenocarcinoma depicting predominantly cribriform pattern (H&E 400 X)

CC *et al*. [8], George E *et al.* [10] and Srikanth K *et al.* [11] reported 72.2 % (393), 88.5% (1029) and 75% of benign cases in their respective studies.

We reported 4/306 (1.3%) Premalignant that is Prostatic intraepithelial neoplasia cases. This was in accordance with findings of Josephine A [12] who reported 1.89% PIN cases. However Schoenfield L *et al.*[13] reported markedly higher and varying figure of 22% PIN cases. Moderately differentiated (that is Gleason score 5-7) was seen in 55.3% cases followed by poorly differentiated

(Gleason score 8-10) in 14.9%. Similar findings were reported by Anushree CN *et al.* [14] in which commonest score was 7 (58.3%) followed by score 8 (25%) and score 9 (16.7%). Shirish *et al.* [15] (52.2%) and Talukder *et al.* [16] (52.6%) also reported similar findings.

Puttaswamy K *et al.* [17] reported slightly less (36.4%) number of cases with Gleason score 7.

Conclusion

Histopathological examination always proved to be an indispensable diagnostic tool in evaluating prostatic lesions. Benign prostatic hyperplasia and Carcinoma of the prostate are go hand in hand with advancing age. Precise pathologic evaluation of the prostatectomy specimen can provide additional prognostic factors such as pathological stages and surgical margin status despite the recent advances in molecular and genetic testing. Since our institution is a tertiary healthcare and cater to large population, so these results can be considered as a reflection of the disease pattern in this particular region of the country.

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Conflicts of Interest
There are no conflicts of interest.

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