



Research Article

HISTOPATHOLOGICAL PATTERN IN PROSTATIC BIOPSIES

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ABSTRACT

Background: The incidence of prostatic diseases increases with increasing age. Prostate gland is about walnut size and surrounds the urethra. The most common diseases are prostatitis, benign prostatic hyperplasia and carcinomas causing mortality and morbidity in males. Prostate cancer is the second most common cancer among males, next to lung cancer worldwide. The purpose of this study is to evaluate histopathological pattern of prostatic lesions in prostatectomy specimens with focus on premalignant and malignant lesions.

Material and method: The present study was a retrospective analysis of prostatic lesions for a period of four years from January 2016 to December 2019. It includes 222 cases of prostatectomy specimen received in the department of pathology, KD Medical college, Hospital and Research Center Mathura Uttar Pradesh. Hematoxylin and Eosin stained sections were examined. The relevant clinical details pertaining to age, clinical complaints and microscopic details were analysed and compared with other similar studies.

Result: Out of the total 222 prostatectomy specimens, 202 (90.99%) were of benign prostatic hyperplasia, 13 (5.85%) were of prostatic intraepithelial neoplasia (PIN) and 7 (3.15%) cases were of Prostatic cancer. Less frequent findings were granulomatous prostatitis in 2 cases and atypical adenomatous hyperplasia (AAH) in 2 out of 222 cases (0.90%). All the 7 cases (3.15%) of prostate cancer were adenocarcinoma, 5 of which were poorly differentiated and 2 were moderately differentiated adenocarcinoma.

Conclusion: Our study showed that non-neoplastic lesions of prostate are more common than neoplastic ones. The most commonly encountered prostatic lesion was benign prostatic hyperplasia, commonly seen in seventh decade (61-70 years). The malignant lesions were common among the males of more than 60 years. Transurethral resection of prostate can be helpful in early identification of premalignant lesions and incidental prostate cancer which can improve the treatment outcome of patients.

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INTRODUCTION

Worldwide diseases of prostate gland responsible for significant morbidity and mortality among adult males.¹ Prostate is one of the most commonly affected organ in males with increasing age, accounting for significant morbidity and mortality. The most common prostatic diseases are inflammatory lesions (prostatitis), followed by nodular hyperplasia (benign prostatic hyperplasia) and carcinoma.

BPH represents nodular enlargement of the prostate caused by proliferation of both glandular and stromal components. The incidence of BPH increases with age, being only 8% during the fourth decade, 50% in the fifth decade and upto 75% in the eighth decade.² Prostatitis occurs in approximately 10% to 15% of men.³ It may be classified as acute, chronic and granulomatous and is a common finding associated with BPH.

TURP is a common urological procedure primarily used for the surgical management of benign prostatic hyperplasia (BPH).⁴

The understanding of biology of premalignant lesions has become increasingly important. These precursor lesions have recently been attributed to the concept of the multistep carcinogenesis of prostate cancer. Two premalignant lesions have been recognized: Atypical adenomatous hyperplasia (AAH) and prostatic intraepithelial neoplasia (PIN). The first description of premalignant changes in prostate was given by Orteil and the term prostatic intraepithelial neoplasia was endorsed. It is defined as a cytological alteration in architecturally normal glands and is further categorized into low grade (LGPIN) and high grade (HGPN). AAH was first described by McNeal and it represents an architectural alteration in cytologically unremarkable glands.^{3,5,6} Carcinoma of prostate is ranked the second most common cause of cancer related deaths in men older than 50 years, the incidence of

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which increases with increasing age.⁷ The presence of tumor in TURP specimen may be due to extensive spread by conventional carcinoma of the peripheral zone of the gland or may be a manifestation of the uncommon carcinoma of transitional zone.³ Clinically in apparent prostate tumors that are incidentally diagnosed in TURP specimens are referred to as Incidental carcinoma of the prostate.^{8,9}

Our study was conducted with an aim to enumerate histopathological pattern of prostatic lesions in prostatectomy specimens.

MATERIAL AND METHOD

The study was conducted in the Department of Pathology, KD Medical College Hospital and Research Center, Mathura, Uttar Pradesh, India. The study consisted of analysis of 222 prostatectomy specimens received in the department of pathology during four years period from January 2016 to December 2019. All histopathological data, pertaining to prostatic specimens maintained in the histopathology section of the department of pathology were retrieved and reviewed. 4-5 microns size sections were cut and then stained with Haematoxylin and eosin and examined. All relevant clinical details were obtained from the respective requisition forms submitted in the pathology department. Each case was analysed with respect to age, clinical presentation and microscopic examination. The various lesions of prostate were listed and the focus was on histological types of hyperplasia, inflammation, pre-malignant and malignant lesions. All the cases of prostate cancers were classified using Gleason's score.

RESULTS

In our study included 222 cases of prostatectomy specimens received in our department over a period of 4 years. Out of these 222 cases, 202 (90.99%) were of Benign prostatic hyperplasia (BPH), 13 cases (5.85%) were of PIN and 7 cases (3.15%) were malignant. Out of these, only 2 cases (0.90%) showed changes of AAH. Cases showing changes of prostatic intraepithelial neoplasia (PIN) were further classified using current concept of low grade and high grade PIN. There were 9 cases (4.05%) of LGPIN and 4 cases (1.80%) of HGPIN (Table-1).

Table 1 Histomorphological pattern in prostatectomy specimens.

| Histopathological Diagnosis | | Cases | Percentage |
|-----------------------------|-------------------------------------|------------|---------------|
| I | Benign Prostatic Hyperplasia | 202 | 90.99% |
| 1 | Without Prostatitis | 125 | 56.30% |
| 2 | With Prostatitis | 75 | 33.78% |
| II | AAH | 02 | 0.90% |
| III | PIN | 13 | 5.85% |
| 1 | LGPIN | 09 | 4.05% |
| 2 | HGPIN | 04 | 1.80% |
| IV | Carcinoma | 7 | 3.15% |
| Total | | 222 | |

All the 7 cases of prostate cancer were histologically adenocarcinomas. 5 of these cases had poorly differentiated adenocarcinoma with Gleason's score of more than 7 while 2 cases had moderately differentiated adenocarcinoma with Gleason's score of 7. All the cases were above the age of 60 years (Table-2). Maximum 81 cases of prostatectomy specimens were obtained from the patients in the age group of

61-70 years accounting for 36.48% followed by 75 cases in 71-80 years of age constituting 33.78%. Benign prostatic hyperplasia was most common in age group of 61-70 years with 73 (48+25) cases (32.88%) followed by 71-80 years with 68 (42+26) cases (30.63%). Maximum 4 cases of LGPIN were seen in the age group of 61-70 years which constituted 1.80% and 2 cases 0.90% were observed in ages between 81-90 years. The minimum number of patients 6 cases (2.70%) were observed below the age of 50 years and 2 cases (0.90%) were above the age 90 years. The youngest patient in our study was of 48 years old and the oldest was 93 years of age (Table2). BPH was the most frequent histopathological finding observed constituting a total of 202 (90.99%) cases. Microscopic features associated with BPH were analysed and changes observed included mixed hyperplasia, predominant stromal or glandular component, cystic dilatation of glands, corpora amylacea, squamous

Table 2 Age wise distribution of prostatic lesions.

| Age group (in years) | BPH | | PIN | | | | Total | Percent |
|----------------------|---------------------|------------------|-----|-------|-------|-----------|-------|---------|
| | Without prostatitis | With prostatitis | AAH | LGPIN | HGPIN | Carcinoma | | |
| 41-50 | 04 | 02 | 00 | 00 | 00 | 00 | 6 | 2.70% |
| 51-60 | 20 | 18 | 00 | 02 | 00 | 00 | 40 | 18.01% |
| 61-70 | 48 | 25 | 01 | 04 | 01 | 02 | 81 | 36.48% |
| 71-80 | 42 | 26 | 01 | 02 | 01 | 03 | 75 | 33.78% |
| 81-90 | 10 | 03 | 00 | 01 | 02 | 02 | 18 | 8.10% |
| >90 | 01 | 01 | 00 | 00 | 00 | 00 | 02 | 0.90% |
| Total | 125 | 75 | 02 | 09 | 04 | 07 | 222 | |

Microscopic features associated with BPH were analysed and changes observed included mixed hyperplasia, predominant stromal or glandular component, cystic dilatation of glands, corpora amylacea, squamous metaplasia, basal cell hyperplasia, atypical adenomatous hyperplasia and inflammation. Prostatitis were categorized into acute, chronic and granulomatous (Table-3). It was seen in association with nodular hyperplasia in 75 cases (33.78%). Chronic prostatitis was most common and these cases showed diffuse infiltration of glands and stroma by mononuclear infiltrate of lymphocytes, plasma cells and histiocytes. Acute prostatitis was observed in 7 cases (9.33%) of BPH and showed neutrophilic infiltrate involving the glands as well as stroma. 2 cases (2.66%) were of granulomatous prostatitis which showed presence of granulomas and multinucleated giant cells.

Table 3 Distribution of cases of prostatitis in BPH

| Types of prostatitis | Number of cases | Percentage (%) |
|---------------------------|-----------------|----------------|
| Chronic prostatitis | 66 | 88 |
| Acute prostatitis | 07 | 9.33 |
| Granulomatous prostatitis | 02 | 2.66 |
| Total | 75 | |

DISCUSSION

Prostate is a fibromuscular organ and has three major glandular regions: peripheral zone, central zone and transitional zone. Prostatic hyperplastic lesions are common in transition zone and peripheral zone is the main site for carcinomas.⁷ Important diseases associated with prostate includes benign prostatic hyperplasia (nodular hyperplasia), inflammation and tumours. Incidence of prostatic diseases increases with age.

In the present study, 222 prostatic specimens were analysed. Benign lesions were more common compared to malignancies which is similar to most other Indian studies.^{1,10,11} We observed 202 (90.99%) cases of BPH, 13 cases (5.85%) of PIN

and 7 cases (3.15%) of prostate adenocarcinoma. Thapa N *et al.* in their study found 92.2% cases were of BPH, 4.8% were prostatic cancers and these observations were comparable with our findings.¹² Begum Z *et al.* also observed almost similar percentage of BPH and adenocarcinoma cases constituting 96% and 4% respectively.¹³

The age of the patients in our study ranged from 48 years to 93 years. Majority of the cases were encountered in the age group of 61-70 years followed by 71-80 years. This correlates with findings of Shirish C *et al.*, Thapa N *et al.* and Josephine A.^{1,12,14} BPH cases were maximum in the seventh decade in our study which was similar to observations made by Kasliwal N *et al.*, Arya RC *et al.*, Kumar M *et al.*^{15,16,17} PIN was diagnosed in 61-80 years age group with maximum number of HGPIN cases in 71-80 years age group and LGPIN cases in 61-70 years age group in our study. This correlates with the study of Khatib W *et al.*¹⁸ We observed that the commonly affected age group by malignancy was 71-80 years which was similar to findings of Kasliwal N *et al.* and Deshmukh BD *et al.*^{15,19}

Benign prostatic hyperplasia represents nodular enlargement of the prostate caused by hyperplasia of glandular and stromal components.³ The most predominant lesion of prostate in our study was BPH, noted in 90.99% of the cases. Majority of the cases of BPH showed a mixed pattern of hyperplasia involving both adenomatous and fibromuscular component which was comparable with Deshmukh BD *et al.* and Mittal BV *et al.*^{19,20} Corpora amylacea was present in most of the cases of BPH.

Prostatitis with BPH was seen in 75 cases (33.78%). Chronic non-specific inflammation was most common (88%). Acute inflammation was seen in 7 cases (9.33%). Non-specific granulomatous prostatitis was noted in 2 cases (2.66%). These findings are similar to the studies of Kasliwal N, Mathi A *et al.* and Puttaswamy K *et al.*^{15,21,22}

Atypical adenomatous hyperplasia (AAH) or adenosis is a common mimicker of adenocarcinoma prostate.^{3,23} It is usually an incidental histological finding, mostly localized in the transition zone and thereby seen more often in TURP specimens.²³ AAH at low magnification appears as complex and disorderly arranged cluster of glands with an expansile margin having minimal infiltration at perimeter but no cytological atypia.^{3,24} The incidence of AAH in our research was noted to be 0.90% which correlates with the findings reported by Puttaswamy K *et al.* (2%) and Garg *et al.* (1.65%).^{21,25}

Prostatic intraepithelial neoplasia (PIN) is defined as a cytological alteration in architecturally normal glands. Currently, it is grouped into two categories: LGPIN and HGPIN. The most important feature in distinguishing HGPIN from LGPIN is nuclear (especially nucleolar) appearance, regardless of architecture. In present study, 13 cases (5.85%) showed PIN out of which 9 cases (4.05%) were of LGPIN and 4 cases (1.80%) were of HGPIN. Gaudin PB *et al.* reported the incidence of HGPIN to be 2.3% in all TURP specimens which correlates with our findings.²⁶ A wide variation in the incidence and prevalence of PIN in nodular hyperplasia has been reported in the world literature, ranging from 12.8% to 43% in different studies.⁵ The occurrence of PIN in TURP specimens as such is reported to be relatively low (2-4%).⁶ It is suggested that in cases of PIN, especially higher-grade,

patients need close follow-up and investigations to rule out existence of carcinoma, especially in the peripheral zone.

Carcinoma of prostate is the second most common malignancy in males. Incidental detection of prostate cancer during TURP has decreased significantly in the era of PSA screening. Prior to the introduction of prostate specific antigen (PSA), detection rate of incidental carcinoma has been reported upto 27% in literature. However, in PSA era, the rate of detection of incidental prostate cancer on TURP has been reported to be 4.1- 16.7%.^{9,12} Most prostatic cancers arise from peripheral zone and tumours detected exclusively in transitional zone account only for 2-7%. In the present study, prostatic carcinoma was diagnosed in 7 cases (3.15%). These cases were previously not suspected of malignancy and were detected incidentally on TURP specimens. Five of these cases had poorly differentiated adenocarcinoma with Gleason's score of 7 while two cases had moderately differentiated adenocarcinoma with Gleason's score more than 7. Comparable results were reported by Thapa N *et al.* and Begum Z *et al.*^{12,13}

CONCLUSION

Our study concluded that Benign Prostatic Hyperplasia is the commonest benign lesion encountered in prostate with chronic prostatitis whereas PIN is relatively less common as observed in this study. It is suggested that the presence of high-grade PIN in the adenomatous zone in cases of nodular hyperplasia requires a follow-up for concurrent or subsequent invasive carcinoma. To increase the probability of detection of carcinoma, more TURP chips should be sampled for histopathological examination. In such cases, needle biopsy should be done to look for additional cancer in the peripheral zone. Identification of premalignant lesions and incidental prostate cancer can improve the treatment outcome of patients. The most common age group affected by BPH and carcinoma is the 61 to 80 years.

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