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Pathology

HISTOMORPHOLOGICAL SPECTRUM OF PROSTATIC LESIONS: AN INSTITUTIONAL STUDY IN NORTH MAHARASHTRA

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ABSTRACT

Background: Prostatic diseases like inflammation, benign prostatic hyperplasia and tumors are important causes of mortality and morbidity in elderly males. The second most common cancer among males is prostate cancer, next to lung cancer worldwide. Transrectal needle biopsy is a quite commonly done diagnostic procedure. Transurethral resection of prostate (TURP) is most frequently performed urological procedure in surgical treatment and total prostatectomy is less commonly performed to treat men with Prostatism. The purpose of this study is to evaluate histomorphological spectrum of prostate lesions in TURP, transrectal needle biopsy and total prostatectomy specimens.

Methods: The present study includes 269 cases of Prostate biopsies which included TURP, transrectal needle biopsy of prostate and total prostatectomy specimens received from January 2017 to June 2019 in the department of pathology, SMBT Institute of medical sciences and research centre, Igatpuri, Nashik. H and E stained sections were examined. The relevant clinical details pertaining to age, clinical complaints and microscopic details were analysed and compared with other similar studies.

Results: Of the total 269 Prostate specimen, 214 (79.5%) were of benign hyperplasia, 28 (10.49%) were of prostatic intraepithelial neoplasia (PIN) and 27 (10.01%) cases were malignant. Benign prostatic hyperplasia (BPH) with prostatitis accounted for 68.4% of Prostate specimen. Less frequent findings were granulomatous prostatitis in 0.74%. All the 27 cases of prostate cancer were adenocarcinoma, 20 of which were moderately differentiated, 4 were poorly differentiated and 3 were well differentiated adenocarcinoma.

Conclusions: The present study showed that non-neoplastic lesions of prostate are more common than neoplastic ones. The most frequently encountered prostatic lesion was BPH, most commonly found in the age group of 61 -70 years. The malignant lesions were common among the males of more than 60 years. Transrectal needle biopsy of prostate and TURP can be helpful in early identification of premalignant lesions and incidental prostate cancer which can improve the treatment outcome of patients.

KEYWORDS : prostate carcinoma, benign hyperplasia, Prostatitis, PIN, TURP

INTRODUCTION

Prostate is one of the most commonly affected organs in elderly males with increasing age, accounting for significant morbidity and mortality. The most important categories of prostatic diseases are inflammatory lesions (prostatitis), benign prostatic hyperplasia (BPH), and carcinoma. Transurethral resection of prostate (TURP) specimens forms a significant percentage of diagnostically challenging cases in surgical pathology.[1] TURP is the most common and least invasive urological procedure primarily used for the surgical treatment of benign prostatic hyperplasia (BPH).[2]

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.[3] Prostatitis occurs in approximately 10% to 15% of men.[4] It may be classified as acute, chronic and granulomatous and is a common finding associated with BPH.

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. Prostatic intraepithelial neoplasia (PIN) is the most widely recognised premalignant lesion of prostate. Orteil gave the first description of premalignant changes in prostate. 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 (HGPIN). Carcinoma of prostate is ranked the second most common cause of cancer related deaths in men older than 50 years, the incidence of which increases with increasing age.[7]

The present study was conducted with an aim to enumerate histomorphological spectrum of prostatic lesions in Prostate specimens.

MATERIALAND METHOD

The study was conducted in the department of pathology, SMBT Institute of medical sciences and research centre, Igatpuri, Nashik. The study consisted of retrospective analysis of all the various types of prostate biopsy specimens (Table 1) received in the histopathology department from January 2017 to June 2019. All histopathological data, pertaining to these prostate specimens maintained in the histopathology section of the department of pathology were retrieved and reviewed. All relevant clinical details were obtained from the respective requisition forms submitted in the pathology department. Each case was analyzed 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. Prostate cancers were classified using Gleason's score.

RESULTS

Our analysis included 269 cases of Prostate specimens received in our department, during a 2.5-year period from January 2017 to June 2019. Out of these 269 cases, 214 (79.5%) were of benign hyperplasia (BPH), 28 cases (10.49%) were of PIN and 27 cases (10.01%) were malignant (Table 1 and 2)

Most (131 cases) of the Prostate specimens were obtained from the patients in the age group of 61 -70 years accounting for 48.7% followed by 73 cases in 71 -80 years of age constituting 27.14%. The most common age group presenting with benign prostatic hyperplasia was 61 -70 years with 105 cases (39.03%) followed by 71 -80 years with 61 cases (22.7%). Maximum number of cases of LGPIN and HGPIN were also seen in the age group of 61 -70 years each consisting of 9 and 7 cases which constituted 3.34% and 2.6%. The youngest patient in our study was of 47 years and the oldest was 96 years of age. Age distribution of cases is depicted in Table 2

BPH was the most frequent histological finding observed constituting a total of 214 (79.5%) cases. Microscopic features associated with BPH were observed and changes found included mixed hyperplasia, predominant stromal or glandular component, cystic dilatation of glands, corpora amylacea, transitional metaplasia, squamous metaplasia and inflammation.

Prostatitis was categorized into acute, chronic and granulomatous (Table 3). Benign prostatic hyperplasia (BPH) with prostatitis was seen in 184 cases (68.4%) followed by benign prostatic hyperplasia alone which was observed in 30 cases (11.11%). Chronic prostatitis was most commonly seen to be associated with BPH i.e., in 170 of 184 cases (92.4%) of BPH with prostatitis. These cases showed diffuse infiltration of glands and stroma by mononuclear infiltrate of lymphocytes, plasma cells and histiocytes. Acute prostatitis was observed in 12 cases (6.5%) of BPH which showed neutrophilic infiltrate involving the glands as well as stroma. 2 cases (1.1%) were associated with granulomatous prostatitis which showed presence of granulomas and multinucleated giant cells.

In the present study, 28 cases (10.49%) showed PIN. PIN associated with carcinoma were excluded in our study. These were further classified using current concept of low grade and high grade PIN. Sixteen cases (6.03%) were of LGPIN and 12 cases (4.46%) were of HGPIN.

Prostatic carcinoma was diagnosed in 27 patients (10.01%). All these were histologically adenocarcinomas. Seven of these cases (2.6%) were detected incidentally on TURP specimens which were not suspected of malignancy. Rest all the 20 cases (7.4%) were detected on Transrectal needle biopsy (n=36) which were suspected malignancies due to their association with high prostate specific antigen (PSA) levels. Majority cases (n=20) had moderately differentiated adenocarcinoma with Gleason's score of 7, four of these cases had poorly differentiated adenocarcinoma with Gleason's score of more than 7 and 3 of these cases had well differentiated adenocarcinoma with Gleason's score of 6 (Table 4). All the cases were above the age of 50 years.

Table 1: Type of specimen wise distribution of prostatic lesions

Prostate Specimens	BPH		PIN		Adenoca-rcinoma	Total (%)
	With Prostatitis	Without Prostatitis	HGPIN	LGPIN		
TURP	173	25	11	13	7	229 (85.13)
Tr. Rec. Biopsy	7	5	1	3	20	36 (13.38)
Prostatectomy	4	0	0	0	0	4 (1.49)
Total (%)	184 (68.4)	30 (11.11)	12 (4.46)	16 (6.03)	27 (10.01)	269 (100)

Tr. Rec. Biopsy: Transrectal needle biopsy

Table 2: Age wise distribution of prostatic lesions

Age group (in years)	BPH		PIN		Adenoca-rcinoma	Total (%)
	With Prostatitis	Without Prostatitis	HGPIN	LGPIN		
45-50	4	0	1	0	0	5 (1.86)
51-60	28	3	0	3	6	40 (14.87)
61-70	89	16	7	9	10	131 (48.7)
71-80	51	10	4	3	5	73 (27.14)
81-90	11	1	0	1	5	18 (6.7)
>90	1	0	0	0	1	2 (0.74)
Total (%)	184 (68.4)	30 (11.11)	12 (4.46)	16 (6.03)	27 (10.01)	269 (100)

Table 3: Distribution of cases of prostatitis

Types of Prostatitis	No. of cases	Percentage (%)
Chronic Prostatitis	170	92.4
Acute Prostatitis	12	6.5
Granulomatous Prostatitis	2	1.1
Total	184	100

Table 4: Gleason's score in adenocarcinoma cases

Gleason's score	No. of cases	Percentage (%)
6 (3+3)	3	11.11
7 (3+4)	13	48.15
7 (4+3)	7	25.9
8 (4+4)	3	11.11
9 (4+5)	1	3.7
Total	27	100

DISCUSSION

Prostate is a fibromuscular organ and have three major glandular regions- peripheral zone, central zone and transitional zone. Prostatic hyperplasia 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, inflammation and carcinoma. Incidence of prostatic diseases increases with increasing age.

In the present study, 269 Prostate specimens were analysed. Benign lesions were more common compared to malignancies which is similar to most other Indian studies.[1,10,11] We observed 214 (79.5%) cases of BPH, 28 cases (10.49%) of PIN and 27 cases (10.01%) of prostate adenocarcinoma.

Puttaswamy K et al observed 80.6% cases of BPH and 19.4% cases of premalignant and malignant lesions which is very similar to our study.[21] Bhatta S et al observed 89.58% cases of BPH and 10.42% cases of premalignant and malignant lesions which is comparable to our study.[28]

The age of the patients in our study ranged from 47 years to 96 years. Majority of the cases were encountered in the age group of 61 -70 years followed by 71 -80 years. This corroborates with findings of Shirish C et al, Thapa N et al, Josephine A, Kasliwal N et al, Arya RC et al, Kumar M et al, Bhatta S et al and Sharma A et al.[1,12,14-17,28,29] PIN was noted in our study, between 61 -80 years with maximum number of both HGPIN and LGPIN cases in 61 -70 years age group. Many different studies show maximum LGPIN cases in 61-70 years age group similar to our study, but HGPIN more common among 71-80 years age group.[18,21,29]

BPH 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 79.5% of the cases similar to other studies done in the Asian sub-continent by Aslam et al[30] (87.5%) and Talukder et al[31] (77.4%). Majority of the cases of BPH showed a mixed pattern of hyperplasia involving both glandular and fibromuscular component which was comparable with Deshmukh BD et al, Mittal BV et al, Puttaswamy K et al, Bhatta S et al and Sharma et al.[19,20,21,28,29] Corpora amylacea was present in most of the cases of BPH. Metaplastic changes comprising of squamous epithelium were noted in 20 cases. One case showed predominantly stromal hyperplasia with scant glandular elements. Similar changes were found in other studies.[1,19-21,29]

Prostatitis with BPH was seen in 184 cases (68.4%). Chronic non-specific inflammation was seen in majority of the cases of BPH with prostatitis (92.4%). Acute inflammation was seen in 6.5% cases. Non-specific granulomatous prostatitis was noted in 2 cases (1.1%). These findings are more or less similar to the studies of Garg et al, Kasliwal N, Mathi A et al, Mittal et al, Puttaswamy K et al and Sharma et al.[15,20-22,25,29]

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.[3] In present study, 28 cases (10.49%) showed PIN out of which 16 cases (6.03%) were of LGPIN and 12 cases (4.46%) were of HGPIN which were associated with BPH. Puttaswamy et al study shows 6.45% isolated cases of PIN associated with BPH.[21] A wide variation in the incidence and prevalence of PIN associated with BPH has been reported in the world literature, ranging from 12.8% to 43% in different studies.[5]

Carcinoma of prostate is the second most common malignancy in

males. Carcinoma was identified in 27 out of 269 cases (10.01%), in our study. The incidence of prostatic carcinoma in biopsies by various studies range from 12.5% reported by Aslam et al.[30] to 24.3% reported by Sinha et al.[32] Thus, there is significant variation in the incidence of malignancies in spite of similar cultural and demographic profiles. Seven cases (2.6%) of adenocarcinoma were detected incidentally in TURP specimens which were not suspected of malignancy. 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 3.26 - 16.7%.[9,12,27,29]

In the present study, a Gleason's score of 7 was seen in 74.05% which was very high when compared to studies by Anushree and Venkatesh[33] (58.3%) and Shirish et al[1] (52.2%).

CONCLUSION

The commonest age group affected by prostate lesions is the 6th decade of life and the most common lesion observed is BPH followed by prostate adenocarcinoma. Increased detection of adenocarcinoma in Transrectal prostate biopsy done in patients with elevated PSA levels, in our study shows the significance of PSA screening in early detection and proper surgical management of prostate adenocarcinoma. PIN lesions present an important diagnostic challenge as they are a known precursor lesion of prostatic carcinoma. Histopathological diagnosis and grading plays a definitive role in the management of prostatic cancer.

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