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Original Research Article

Histomorphological Spectrum of Prostatic Lesions in TURP and Needle Biopsies

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Abstract

Introduction: Transurethral resection of prostate and prostatic biopsies are very common specimens in surgical pathology. Prostatic biopsies are done in cases where there is clinical suspicion of malignancy. These specimens have to be thoroughly examined to avoid false negative diagnosis of adenocarcinoma prostate. Non-neoplastic lesions which are to be distinguished from adenocarcinoma prostate are atrophy including partial atrophy, atypical adenomatous hyperplasia (adenosis), crowded benign glands, sclerosingadenosis, radiation atypia in benign glands, basal cell hyperplasia, clear cell cribriform hyperplasia, non-specific granulomatous prostatitis, dense inflammation and malakoplakia. *Aims and objective:* The aims of this study is to evaluate the spectrum of histomorphological lesions of prostate and evaluating them with them help of Immunohistochemisry (IHC) markers such as P63 and AMACR. *Material and methods:* A total of 100 TURP and 20 needle biopsies were collected and examined each under light microscopy for benign, premalignant, and malignant lesions. All the biopsies are stained with H&E and doubtful lesions were stained with P63 and AMACR. *Results:* Total 90 were benign in TURP and 6 in biopsies specimen. Low grade pin was found in TURP biopsies amounting to 10% and 4% HGPIN in vicinity to neoplastic glands. Most common gleasons scoring was 7. IHC was done, AMACR was positive in HGPIN and in adenocarcinoma and p63 was focally disrupted in HGPIN and totally absent in adenocarcinoma. *Conclusion:* The substantial proportion of patients undergoing TURP and biopsies for clinically symptomatic benign enlarged prostate emphasizes the need for early diagnosis through histopathological examination.

Keywords: BPH; Carcinoma prostate; PIN; P63 and AMACR.

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Introduction

Prostate is one of the most commonly affected organs in males with increasing age, accounting for significant morbidity and mortality. The most important categories of prostatic diseases are inflammatory lesions (prostatitis), nodular hyperplasia (benign prostatic hyperplasia), and carcinoma. Transurethral resection of prostate (TURP) specimens form a significant percentage of diagnostically challenging cases in surgical pathology.[1]

It is well recognised by both urologists and pathologists that BPH and inflammation can coexist, but this interrelationship between BPH and prostatic carcinoma and how one, may influence the presentation of other, is unknown.

On the other hand, putative premalignant lesion of the prostate gland have been recognised for a long time, and they may be associated with the histological diagnosis of BPH.[2]

Most foci of PIN in young men are low grade, with increasing frequency of HGPIN with advancing age. The volume and geographic location may also influence the incidence of HGPIN. African and American men have a greater prevalence of HGPIN than whites in the 50–60 years age group. In contrast, Japanese men living in Osaka, has a significantly lower incidence of HGPIN than men residing in the United States and Asians.

In contrast to HGPIN, the presence of low grade PIN is distinctly different and has no clinical significance. As a result, men with low grade PIN do not require a repeat biopsy unless other clinical indicators are present. In addition, using the term low grade PIN in the pathology report can lead to confusion with HGPIN. PIN does not significantly elevate serum prostatic specific antigen (PSA) concentration and cannot be detected by ultrasonography. It is very important to diagnose and correctly use the term HGPIN and to avoid confusion with other atypical entities of the prostate, which may differ with respect to clinical significance.[3]

Materials and methods

This study has been conducted for a period of three years on total of 100 TURP and 20 needle biopsies received in the department of Pathology, SNMC Bagalkot.

All the specimen received were fixed in 10% formalin and then processed routinely.

Sections were stained with haematoxylin and eosin and all relevant clinical data were obtained in each case and analysed with respect to age, clinical presentations and microscopic examinations. The doubtful lesions such as PIN, atypia and adenocarcinoma were stained with P63 and AMACR. Gleason grading system were used for adenocarcinoma.

All TURP and needle biopsies were included and specimen and biopsies which were unpreserved are not processed sequentially and excluded from the study.

Results

Our study included 100 TURP and 20 needle biopsies received in our department of pathology for a period of 3 years (Tables 1-6).

Table 1: Distribution of benign and malignant lesions in different types of specimen

	Benign	Malignant
TURP	100	00
Needle biopsies	10	10

Table 2: Age wise distribution of different types of Prostatic lesions

Age in years	BPH	Basal cell hyperplasia	AAH	PIA	PIN	Granulomatous Prostatitis	Adenocarcinoma
40–50	10	00	00	00	00	00	00
51–60	20	02	00	03	02	00	02
61–70	30	02	04	01	10	02	06
71–80	20	00	00	00	02	00	02
81–90	02	00	00	00	00	00	00
Total	**82**	**04**	**04**	**04**	**14**	**02**	**10**

Table 3: Distribution of various types of benign lesions in TURP specimens

Nature of lesions	Number of cases	% of cases
BPH with prostatitis	74	74%
Granulomatous prostatitis	02	2%
Transitional metaplasia	02	2.0%
PIA	04	4.0%
Basal cell hyperplasia	04	4%
Atypical adenomatous hyperplasia	04	4%
Low grade PIN	10	10%
Total	**100**	**100**

Table 4: Distribution of different types of lesions in needle biopsies

Nature of Lesions	Number of cases	% of cases
Nodular hyperplasia	04	20%
Atrophy	02	10%
HGPIN	04	20%
Adenocarcinoma	10	50%
Total	**20**	**100**

Table 5: Analysis of predominant Gleason pattern

Gleason pattern	Number of cases	% of cases
3	04	20%
4	04	20%
5	02	10%
Total	**10**	**50%**

Table 6: Analysis of Adenocarcinoma according to Gleasons score

Gleason score	Number of cases	% of cases
6	–	–
7	06	30%
8	02	10%
9	–	–
10	02	10%
Total	**10**	**50%**

Discussion

Prostate is a fibromuscular organ and have three major glandular regions-peripheral zone, central zone and transitional zone. Prostatic hyperplastic lesions are common in transition zone and peripheral zone is the major site for carcinomas. Important diseases associated with prostate includes benign nodular hyperplasia, inflammation and tumours. Incidence of prostatic diseases increases with increasing age.[1] For diagnosis needle biopsy is most common modality but in our study TURP comprised the maximum number of samples.

In the present study total 120 (100 TURP and 20 needle biopsies) were analysed. Benign lesions were more common compared to malignancies which is similar to most other Indian studies. We observed total 78 cases amounting to 65.83% cases of BPH, 14 cases amounting to 11.6% PIN cases out of which 10 were low grade PIN and 4 cases were high grade PIN and 10 cases of adenocarcinoma (8.3%).

In a study done by Wasim[4] *et al.* on total 86 samples comprising of TURP, Needle biopsies and prostatectomy specimen they also came across maximum number of BPH having 45 (51.36% followed by high grade PIN in 15 and low grade PIN 13 cases which is higher than in our study due to maximum number of samples and also type of samples received in their study. BPH was less compared to our study because we collected 100 TURP samples.

In a study done by Subhrata[5] *et al.* on total 108 TURP specimen they found 88.9% cases of BPH followed by 10 malignant lesions and foci of low grade PIN in 12 cases which is correlating with our study. High grade PIN in their study was 2.76% where as in our study 4 cases were seen amounting to 3.3% found in needle biopsy.

Two granulomatous lesions were also seen in their study and in our study we came across only one case. In a study done by Wasim *et al.*[4] foci of low grade PIN and high grade PIN was found near Nodular hyperplasia. Foci of high grade PIN was identified in 4 cases (3.3%). Among the three cases one was BPH and other two were adenocarcinoma. In our prospective study malignant lesions was most common amounting to 8.3% and PIN cases were total 11.6% and in study done by Wasim *et al*.[4] it is 11.11% PIN which is correlating with our study.

In our study highest number of cases has been seen in between 61–70 amounting to total 56 cases followed by 50–60, total 29 cases which is substantiating with study done by Sharma *et al*[1] who had same maximum number of cases in 61–70 and in 71–80 years of age. This is because these symptoms are related to, increase in age. American Cancer society estimate that the average age at the time of diagnosis was about 66 years of age[6]. However our study showed that there was no significant relation between age and carcinoma.

In a study done by Schonfield *et al.*[7] on 100 men underwent needle biopsy for abnormal digital rectal examination and PSA value >2.5 ng/ml. Out of the 100 patients, 34% had normal findings (benign prostatic tissue, BPT), 39% had cancer, 26% had HGPIN and cancer, 22% had HGPIN alone, and 5% had Adenocarcinoma. Repeat biopsies were available in nine of the 22 (41%) patients with HGPIN, four of five with Adenocarcinoma, and 10 of the 34 (29%) with Benign prostatic tissue. The median (range) interval between the first and second biopsy was 13 (4–36) months. Prostate cancer was detected at the second biopsy in a one third of patients with isolated HGPIN on the first biopsy, and one of the four with Adenocarcinoma.

This is slightly higher than our study in which we had considered 20 needle biopsies and 100 TURP in which only HGPIN was seen in needle biopsy constituting about 20% associated with adenocarcinoma and 30% alone had adenocarcinoma.

According to study done by various authors incidence of adenocarcinoma prostate is 12.5% by Aslam *et al.*[8] and 24.3% by Sinha *et al.*[9] in needle biopsy. Most frequently observed by Bharti *et al.*[12] on 226 prostatic biopsies predominant patterns were pattern 3 and 4 seen in 8 (44.44%) and 7 (38.89%) cases respectively. No cases showed pattern 1 or 2 intheir present study which is similar to our study in which we have seen most predominant pattern of 3 and 4 comprising of 20% in each and 10% in pattern 5

Another study done by Puttuswamy *et al.*[10] On 62 biopsies comprising of needle and TURP biopsy they had reported both malignant and premalignant is 19.4% (12 cases) and both malignant and premalignant in the age group of 51–80 years of age. Gleason scoring of 7 was most common seen in 36. 3.2% of cases and Gleason's score of 8 and 9 were seen in 27.2% cases each whereas in our study Gleason score 7 comprises of 30% and 8, 10 score of Gleason score encompasses 10% of all cases of adenocarcinoma.

Anand[11] and his colleague studied on 310 cases, 226 cases were benign, 44 cases were frank malignancies and 40 are suspicious/premalignant. Out of 40 cases selected to IHC, only 20 cases, 14 were underdiagnosed as benign or suspicious of malignancies. These got upgraded to HGPIN or carcinoma with foci of HGPIN. Remaining 6 were downgraded from pre malignant to benign lesions on IHC. Out of 40 suspicious cases, in 31 there is good staining of basal cell by P63 and HMWCK. In rest of 9 cases, they showed superior basal cell layer staining when compared to HMCWK.

In our study we had done IHC using AMACR and P63 on all adenocarcinoma and premalignant irrespective of gleason grade using normal BPH as a control. All Adenocarcinoma prostate showed diffuse dark staining of cytoplasm irrespective of grade constituting about 8.3% of cases and focal diffuse in 4 HGPIN cases. (3.3%). P63 was focally disrupted in these HGPIN cases and absent in adenocarcinoma prostate and few cases showed luminal positivity which is resolved to basal cell hyperplasia. These all findings has correlated with study done by Anand *et al.*[11] study as we had used rabbit monoclonal antibody which is more sensitive.

Conclusion

Histopathologicaldiagnosis, grading of adenocarcinoma prostate plays an important role in guiding line of management of patient. HGPIN when seen should be reported by pathologist

because it has a predictive value for adenocarcinoma prostate.

Even though diagnosis of carcinoma prostate is multidisciplinary approach, IHC acts as a valuable adjunct which significantly increases the diagnostic accuracy in prostatic carcinoma.

No single marker is having 100% sensitivity therefore a combination of basal cell marker P63 and AMACR is more instructive in the diagnosis of carcinoma prostate and differentiating it from benign mimics.

Conflict of interests None

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