

## **The histomorphological study of prostate lesions**

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**Abstract:** With increasing life expectancy, increasing awareness and better health services lesions of prostate has become a common specimen received for diagnostic of both benign and malignant lesions which may have a very similar presentation but their management and prognosis is quite different. Most important investigation is the biopsy of the prostate. A visual of features of the lesion gives best diagnosis. 122 prostate specimens were studied over a period of 21 months and revealed most common lesion to be benign prostatic hyperplasia routinely diagnosed on the commonest type of specimens obtained that were transurethral resection of prostate (TURP) with peak age of occurrence in 6<sup>th</sup> decade of life. Adenocarcinoma cases of Gleason grade 4 were common also in same age range. Prostatic intraepithelial neoplasia lesions present a diagnostic challenge due to them being a known precursor lesion of prostatic carcinoma. Histopathological diagnosis and grading plays a definitive role in the management of prostatic cancer.

**Keywords:** prostate, benign hyperplasia of prostate, adenocarcinoma, Gleason grade, HGPIN

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### **I. Introduction-**

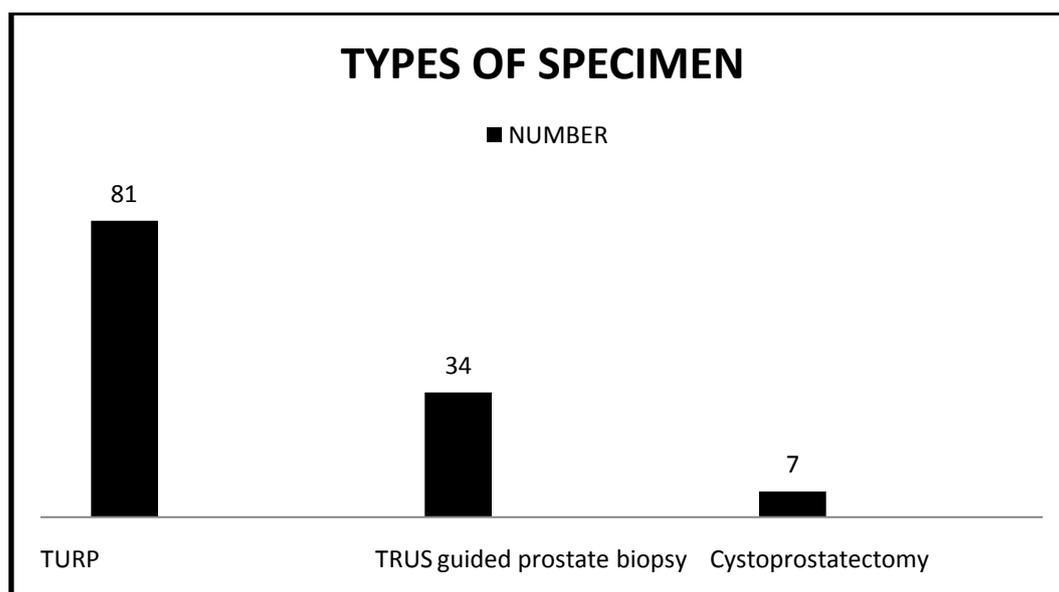
Prostate is essential structure of the male reproductive system composed of glands and stroma and its secretions forming 30-50 % of the seminal fluid volume.[1] With increasing life expectancy, increasing awareness and better health services lesions of prostate has become a common specimen received for diagnostic of both benign and malignant lesions. Most patients of benign lesions present with complaints related to micturition and incontinence. The problem lies in the fact that malignant and benign lesions of prostate may have a very similar presentation but their management and prognosis is quite different. Thus patients who have been suffering from such symptoms should have themselves checked. A regular examination specifically includes digital rectal examination (DRE) for an enlarged prostate apart from list up of the urinary complaints. This DRE may not always be conclusive. A lab investigation that was previously linked to prostatic lesion is prostate specific antigen levels whose increased levels were thought to be a good indicator. [2, 3] But its significance is only complete when it is supported by histopathology. The most important investigation in such cases is the biopsy of the prostate. Visually interpreting the features of the lesion gives best diagnosis. Knowing the histological grade in malignant lesions helps in proper management. Thus diagnosis of prostatic lesions is important both to the clinician and pathologist.

### **II. Material And Methods**

The current study is a prospective study which includes data of cases from January 2014 to September 2015. The type of specimens received were transurethral resection of prostate (TURP), transrectal ultrasound (TRUS) guided trucut biopsy and cystoprostatectomy. The clinical data was collected from biopsy forms and medical record department. The received specimens were fixed in 10% formalin and routine hematoxyline and eosin staining was done. All the specimens were analysed as type of specimen, age of patient, microscopic features and diagnosis. The 2002 W.H.O. classification was used to diagnose and classify prostate tumours. The cases of adenocarcinoma were graded according to Gleason grading system.[4]

### **III. Results**

In this study a total of 122 prostate specimens were studied which were received between January 2014 to September 2015 in the histopathology section of department of Pathology. Of the 122 specimens 81 (66 %) were TURP specimens which were received as soft to firm grey white chips. Also 34 trucut biopsy specimens (29%) were obtained as linear tissue strips, 0.3 to 1cm long.



**Table 1:** Distribution of types of specimen received

The most common lesion diagnosed was benign prostatic hyperplasia in 79 cases with peak age of occurrence in 6<sup>th</sup> decade of life. In the same age range maximum cases of the 30 adenocarcinoma cases were seen. High grade prostatic intraepithelial neoplasia (HGPIN) was diagnosed in 8 cases.

Diagnosis	Number of cases	Percentage (%)
Benign prostatic hyperplasia	79	61
Adenocarcinoma	30	25
High grade prostatic intraepithelial neoplasia	8	7
Granulomatous prostatitis	3	2
Embryonal rhabdomyosarcoma	1	<1
Small cell carcinoma	1	<1

**Table 2:** Distribution of number of cases by diagnosis

### Benign prostatic hyperplasia

On microscopy the glandular component is made up of nodules of small and large acini lined by basal and secretory cells. Some gland show papillary infolding and projections and others that are dilated and cystic. Stromal component often shows both fibrous and smooth muscle elements. Maximum cases were in age range of 6<sup>th</sup> followed by 7<sup>th</sup> decade. Few cases also showed prostatitis.

### Adenocarcinoma

Adenocarcinoma of prostate is the most common type of malignancy in the prostate and the glandular pattern observed under low power microscope is important as it used for Gleason grading [4]. This grading system has described 5 patterns; which are recognized as primary dominant pattern and the secondary (second most dominant) structural patterns and given a grade from 1 to 5 with 1 being most differentiated and 5 the least differentiated. These two grades are added together to obtain the Gleason score. The most common predominant grades observed in this study were grade 4 and grade 3. No cases showed grades 1 and 2. The most common score obtained was 7 in 13 cases of the total 30 adenocarcinoma cases.

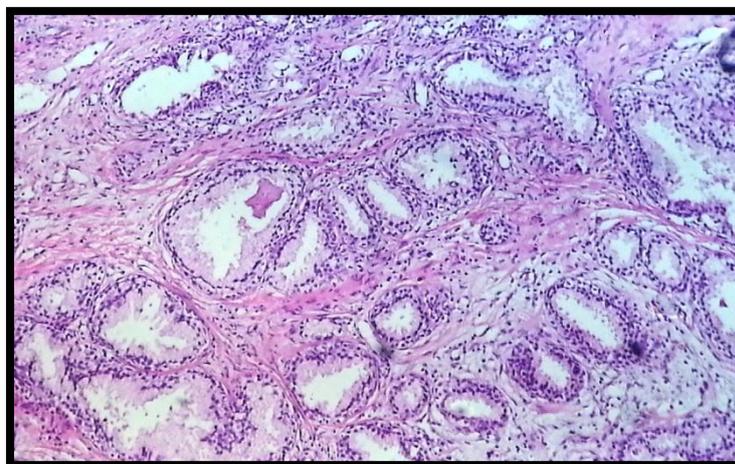
### Prostatic intraepithelial neoplasia

The diagnosis of prostatic intraepithelial neoplasia (PIN) is made when microscopically benign prostatic acini or ducts are lined by cytologically atypical cells showing stratification and slight nuclear enlargement.[5],[6],[7] In the current study 8 cases of PIN were diagnosed.

## IV. Discussion

BPH and adenocarcinoma are the two most common conditions affecting prostate gland. In our study TURP specimens were most common specimen received which was similar to that in studies conducted by Shakya et al [8] and Mittal et al [9] indicating a similar diagnostic approach. In the present study, we had 61% cases of BPH, 25% cases of adenocarcinoma and 7% case of HGPIN. The findings in our study are comparable with those of Mittal et al [9], Mohammed et al [10] and Sharma et al [11].

BPH is a condition where hyperplasia of both glandular and stromal components leading to an enlarged prostate gland. The clinical incidence of this disease is only 8% during the fourth decade, but it reaches 50% in the fifth decade and 75% in the eighth decade of life [12]. However, symptomatic BHP producing urinary complaints and requiring surgical intervention is seen in only 5-10% of cases. Hyperplastic glands appear cystically dilated with lining of two layers of cells, an inner columnar layer and an outer layer of cuboidal or flattened epithelium (Figure 1). The nucleoli are inconspicuous. A continuous basal cell layer is seen immediately above a basement membrane [13]. These glands often contain thickened secretions in their lumen called corpora amylacea[14].



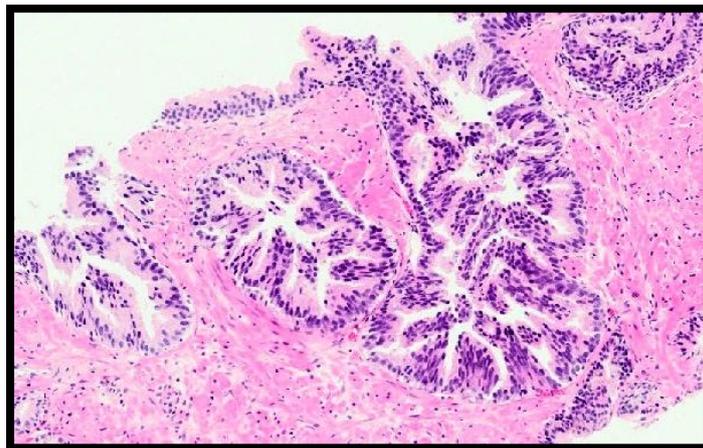
**Fig 1.** Benign hyperplasia of prostate (H&E X400)

In our study maximum cases of BPH were diagnosed in TURP specimens that are similar to Arora et al [15]. This shows that TURP is still considered the gold standard for BPH cases. Maximum cases of BPH were seen in the 61-69 years age group similar to Matapurkar et al[16]. Kim KB[17] et al had more cases in 8th decade age group.

Chronic prostatitis is most commonly observed in nodular hyperplasia which was also seen by Kohnen et al [18] in his study. But it is important to distinguish the true infectious processes of prostate from the inconsequential mononuclear infiltrates often seen accompanying nodular hyperplasia [19]. In the current study 14 cases were diagnosed as chronic prostatitis where in microscopy showed presence of periglandular or interglandular mononuclear cell infiltrate in the stroma, composed mainly of lymphocytes, few plasma cells and histiocytes.

Granulomatous prostatitis can be clinically confused with prostatic carcinoma. The reported incidence of granulomatous prostatitis is 0.36-4% [20],[21]. It is thought to represent an initially immune-mediated process accompanied by a reaction to the prostatic secretions released from obstructed ducts [22, 23,24]. Histologically, an inflammatory reaction consisting of lymphocytes, macrophages, plasma cells and some giant cells is seen. These granulomas are mostly centred in the lobules [25]. In the current study 2 cases of this condition were seen.

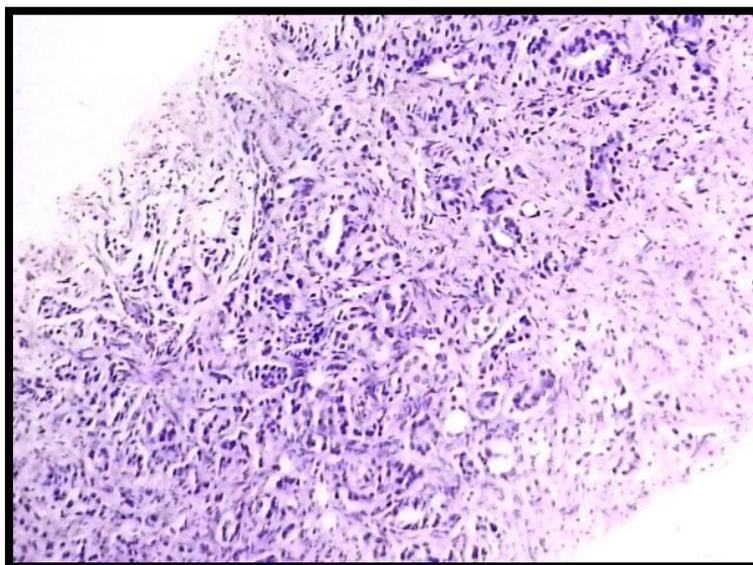
PIN has been identified as a precursor lesion for prostatic carcinoma [26]. Currently conventional use of the term 'PIN' without qualification refers to only high grade PIN (HGPIN). The clinical importance of recognising PIN is based on it being strongly associated with carcinoma of prostate. PIN has a high predictive value as a marker for adenocarcinoma and its identification in biopsy specimens of the prostate should necessitate a thorough search for invasive carcinoma [27]. PIN consists of architecturally benign large, branching prostatic acini lined by cytologically atypical cells with prominent nucleoli [5].(Figure 2) In our study 8 cases showed HGPIN features.



**Fig 2.** High grade prostatic intraepithelial neoplasia (H&E X400)

Carcinoma of prostate is the second most common malignancy in men, second only to lung cancers [28]. It is commonly seen in men above age of 50 years and it has age related increase in incidence, affecting approximately 70% in men between the ages of 70 and 80 years [29]. Androgenic hormones play an important role in occurrence of prostatic carcinoma [30]. A higher incidence has been seen in males with a first degree relative being affected [31].

Microscopically in carcinoma there is only a single cell type without the basal layer. The pathological diagnosis of carcinoma is indicated by crowded glands growing in haphazard fashion, large acini without convolutions, fused glands, gland in gland, columns, cords and solid sheets. Nuclear enlargement with prominent nucleoli is common (Figure 3). Adenocarcinoma accounted for 25% cases in our study. Maximum numbers of our cases were in the 6<sup>th</sup> decade. Sharma et al [11] had more cases in 7th decade.



**Fig 3.** Adenocarcinoma of prostate (H&E X400).

Adenocarcinomas were graded according to Gleason's system [2] by taking into account morphological appearance of glandular cells and the glandular pattern. Most common predominant grades observed in this study were grade 4 while none of the cases showed grades 1 and 2. The most common score obtained was 7 in 13 cases of adenocarcinoma. Vollmer [32] had score 6 most common whereas Brawn et al [33] had scores 6 & 7. Adenocarcinoma cases commonly show the presence of malignant glands within perineurial spaces [34]. This finding is a strong indicator of malignancy but is not pathognomonic[35]. It represents spread of glandular tissue along planes of lesser resistance [36, 37]. Its presence in a needle biopsy specimen is a good predictor of capsular invasion by the tumor [38]. Perineurial invasion was seen in 9 of the 30 carcinoma cases.

## V. Conclusion

TURP specimens were the most common type of specimen received for prostatic conditions. The commonest age group affected by prostate lesions is the 6<sup>th</sup> decade of life and the most common lesion observed is BPH followed by 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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