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Spectrum of histopathological lesions of prostate in a tertiary care center

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Abstract
Background: Prostatic diseases like inflammation, benign prostatic hyperplasia and tumors are important causes of mortality and morbidity in males. The incidence of prostatic diseases increases with advancing age. The present study is to evaluate histomorphological spectrum of lesions in prostate and to classify prostatic carcinoma by using modified Gleason score and Prognostic grade group.
Result: During the study period, 90 specimens of prostate were received in pathology department, HIMS, Hassan. Age of patients ranged from 40 years to 90 years with a mean age of 67.5 years. Prostatic cancer was most commonly seen in 7th decade. Out of 90 cases, non neoplastic 58 cases (64.4%), premalignant 7 cases (7.8%) and neoplastic 25 cases (27.8%). Benign hyperplasia of prostate (BPH) was the most common histological diagnosis (44cases) followed by prostatic adenocarcinoma (25 cases).
Conclusions: The present study showed that non-neoplastic lesions of prostate were more common than neoplastic ones. Prognostic grade group should be applied for prostatic carcinoma which is simple and more accurate grade stratification than modified Gleason score.

Keywords: Gleason's score (GS), prognostic grade group (PGG), LGPIN (Low grade prostatic intraepithelial neoplasia), HGPIN (High grade prostatic intraepithelial neoplasia)

Introduction
Diseases of Prostate gland both benign and malignant are the important source of morbidity and mortality, which increases with age [1-8]. Various prostatic lesions presents with same clinical features, diagnosis is essential as their management and prognosis is quite different.[7] Prostatic cancer constitutes about 5% of all malignancy in males [6, 8] Screening of prostatic lesions constitute prostate specific antigen, digital rectal examination, and transrectal ultrasound but transrectal biopsy remains the gold standard diagnostic tool [4].
Transurethral resection of prostate (TURP) is most frequently preformed surgical procedure in the clinical practice and it aids in early identification of premalignant lesions and incidental prostate cancer which can improve the treatment outcome of patients [5]. Gleason's microscopic grading with PSA are important for diagnosis, management, and prognosis of carcinoma [8].
Gleason's grading was modified in 2014 conducted by International Society of Urological Pathology (ISUP). WHO 2016 proposed and adopted, Prognostic grade grouping which provided more accurate stratification of tumors and has simplified the number of grading categories from 1–5 based on different pattern combinations. It helped to reduce overtreatment of indolent cancer [9-11].
The present study was taken to evaluate various histopathological lesions of prostate and to classify the patients with prostatic adenocarcinoma into new prognostic grade group (PGG) and revised Gleason score.

Material and Methods
This is a prospective study which includes data of cases from February 2019 to January 2020. Transurethral resection of prostate (TURP), transrectal ultrasound (TRUS) guided trucut biopsy and cystoprostatectomy specimens was analysed in the present study. Biopsy of prostate is done in cases, where it's indicated. The clinical data was collected from biopsy request forms and medical record department. The received specimens were fixed in 10%

formalin and routine hematoxylin and eosin staining was done. All the specimens were analysed as type of specimen, age of patient, microscopic features and malignant cases were classified according to Gleason's grading system and prognostic grade group.

New modified gleason grading system

- Gleason patterns 1–3 distinct, discrete, and individual glands.
- Gleason pattern 4 fused, cribriform, or poorly-formed glands, or glomerularion.
- Gleason pattern 5 comedo necrosis, cords, sheets, solid nests, and single cells.

New prognostic grade group

- Gleason score ≤6: Prognostic Grade group I
- Gleason score 3+4=7: Prognostic Grade group II
- Gleason score 4+3=7: Prognostic Grade group III
- Gleason score 4+4=8, 3+5=8, 5+3=8: Prognostic Grade group IV
- Gleason score 4+5=9, 5+4=9, 5+5=10: Prognostic Grade group V.

Various histopathological lesions were correlated with prostate specific antigen level. Statistical analysis of data is expressed as numerals and percentage.

Results

The present study included 90 cases over a period of 1 year which included TURP, biopsy specimen and prostatectomy specimens.

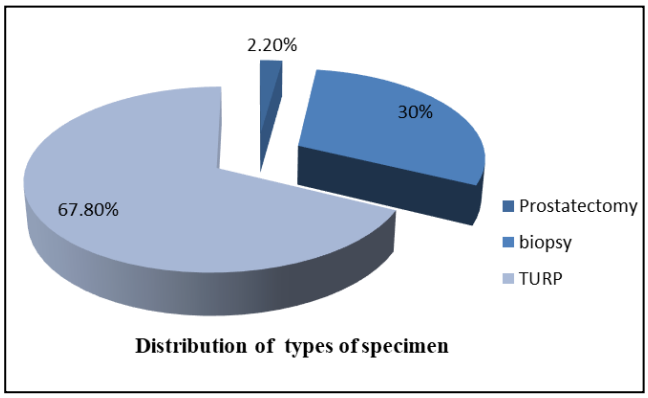

Fig 1: Distribution of different specimen received

Table 1: Age-wise distribution of cases

SI. No	Age in years	NO. Of cases
1	31-40	01(1.1%)
2	41-50	02(2.2%)
3	51-60	19(21.1%)
4	61-70	37(41.1%)
5	71-80	23(25.6%)
6	81-90	08(8.9%)

In the present study cases were distributed in the age group of 40–90 yrs. The maximum number of prostatic lesions was in the age group of 61-70 years followed by 71-80 years.

All prostatic specimens were broadly classified into non neoplastic 58 cases (64.4%), premalignant (PIN I, PINII) 7 cases (7.8%) and neoplastic 25 cases (27.8%). Most common benign lesion was benign prostatic hyperplasia/ nodular hyperplasia - 44 cases. (Fig 2) (Fig 3, bn4). Prostatic adenocarcinoma was the only type of carcinoma noted in the present study. (Fig 5, 6)

Table 2: Shows distribution of benign and premalignant lesion

SI. No	Lesions	No. of cases
1	BPH	44
2	BPH with acute prostatitis	01
3	BPH with chronic prostatitis	10
4	BPH with basal cell hyperplasia	01
5	Atrophy	02
6	BPH with PIN I	3
7	BPH with PINII	2
8	PIN I	2

The preoperative PSA was available in 25(27.8%) cases out of 90 cases. PSA levels were>40ng/ml in fourteen (14) cases of prostatic carcinoma and in one case it was 34ng/ml.

Table 3: Stratification of PSA and comparison with histopathology

PSA	Histopathology	
	Nodular hyperplasia	Adenocarcinoma
<4	1	0
>4-10	03	0
11-20	03	0
21-30	0	0
31-40	03	1
>40	0	14

Table 4: Shows Prostatic Adenocarcinoma graded according to modified Gleason score (GS) and prognostic grade grouping (PGG)

SI. NO	Procedure	AGE	GS	PGG
1	Core biopsy	55	3+3	I
2	Core biopsy	70	3+4	II
3	Core biopsy	68	4+4	IV
4	Core biopsy	72	3+4	II
5	Core biopsy	60	4+3	III
6	Core biopsy	75	3+4	II
7	Core biopsy	85	3+3	I
8	Core biopsy	70	3+5	IV
9	Core biopsy	70	3+3	I
10	Core biopsy	65	3+4	II
11	Core biopsy	70	3+4	II
12	TURP	58	3+4	II
13	Core biopsy	60	3+4	II
14	Core biopsy	65	5+4	V
15	Core biopsy	63	4+3	III
16	Core biopsy	72	5+4{Perinuclear invasion}	V
17	Core biopsy	70	3+4	II
18	TURP	60	3+3	I
19	Core biopsy	80	3+2	I
20	TURP	65	4+5	V
21	TURP	60	5+4{Perinuclear invasion}	V
22	TURP	73	3+4	II
23	Core biopsy	68	3+4	II
24	Core biopsy	55	3+4	II
25	Core biopsy	70	4+3	III

Prostatic adenocarcinoma was most common in the age group of 61-70 years, with mean age of 68 years. It was incidentally found in 5 cases of TURP specimens sent as BPH. Other 2 cases showed perineural invasion.

Prostatic adenocarcinoma was graded according to Modified

Gleason score and positive predictive group grading. The most common pattern was 3+4, group II of PGG.

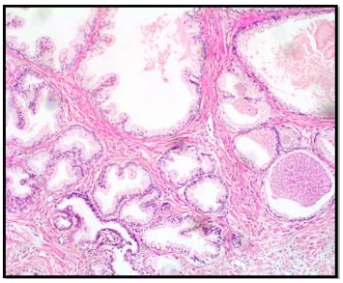

Fig 2: Microphotograph of Nodular hyperplasia of prostate (x10)

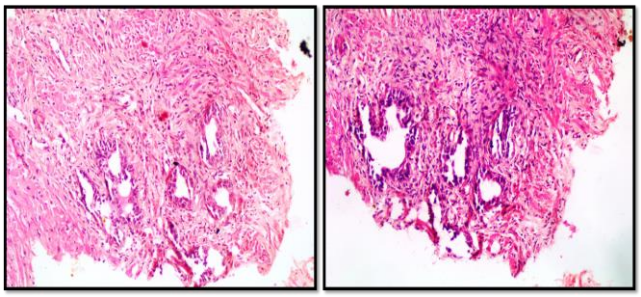

Fig 3: Microphotograph of PIN I/LGPIN (x10)

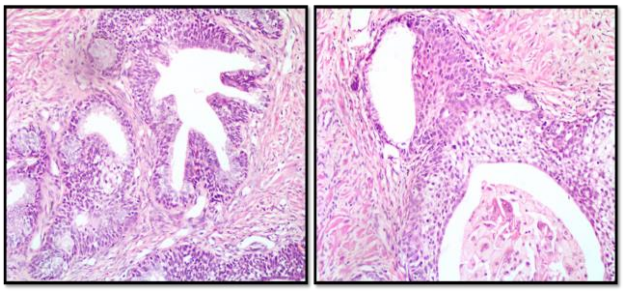

Fig 4: Microphotograph of PIN II/HGPIN (x10)

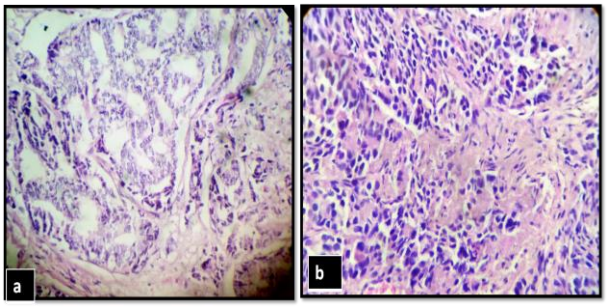

Fig 5: Microphotograph of Prostatic adenocarcinoma. (x10)

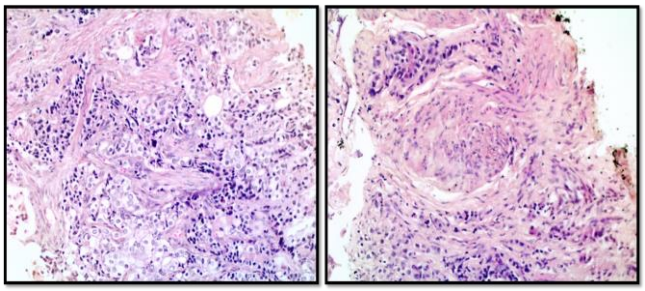

Fig 6: Microphotograph of Prostatic adenocarcinoma showing perineural invasion (x10)

Discussion

In our study TURP specimens were most common specimen received which was similar to that in studies conducted by Joshee A *et al* [1]. The most common age group involved in the present study was 61-70 years with a mean age of 67.5 years which is similar to that of Yadav *et al.* [4] and Sharma *et al.* [5].

In the present study, BPH (27.8%) was the most common finding which was similar to that of study done by Joshee A *et al.* [1], Thaker BD *et al.* [2],Yadav *et al.* [4], Sharma *et al.* [5].

PIN being a precursor for invasive prostatic carcinoma, was found in 7 cases in the present study. Five cases (5.6%) were of LGPIN and 2cases (2.22%) were of HGPIN which is similar to that of study of Koteswari M *et al.* [7] and Sharma *et al.* [5].

Adenocarcinoma was seen most common in 7th decade individuals (27.8%), this incidence is higher in the present study compared to study done by Joshee A *et al.* [1], Yadav *et al.* [4] and Sharma *et al.* [5].

Prostatic adenocarcinoma is graded according to Modified Gleason's score(GS) and PGG, Grade Grouping II(48%) was most common in the present study and Grade Grouping I in 4(16%)cases, III in 3(12%) cases, IV in 2(8%) cases and Grade V in 4 cases(16%). The 5-grade prognostic groups were shown to be more accurate in predicting progression than the 3 GS groups [10]. The 5-year biochemical risk-free survival for the 5-grade groups based on RP grade was 96%, 88%, 63%, 48%, and 26% [12].

Conclusion

To conclude, BPH was the most common lesion in the present study. Modified Gleason scoring patterns and prognostic grade grouping should be done in conjunction for assessing prognosis and management until it's widely accepted and practiced.

TURP chips should be examined thoroughly to rule out premalignant lesion and incidental carcinoma.

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