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PROSTATIC CARCINOMA HISTOLOGICAL STUDY IN CORRELATION WITH THE Ki67 IMMUNOMARKER AND PSA LEVELS

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ABSTRACT

Background: Prostate cancer is the second most common cancer in men and the fourth most common cancer overall. 1.4 million new cases of prostate cancer diagnosed in 2020. PSA and Gleason's score (GS) before treatment are important diagnostic and therapeutic indicators. According to studies, GS degrades tumors while PSA is not cancer-specific. The current study studies the relationship between Ki67, GS, and PSA, which is used to grade tumors and predict patient prognosis. **Objectives:** 1. To study the histopathology of prostate carcinoma and its variants and assign them a Gleason score as per the Gleason grading system. 2.To study Ki-67 immuno expressing in prostate carcinoma. 3. To correlate Ki-67 expression, Gleason scoring, and serum prostate-specific antigen levels in prostate carcinoma, **Methods:** A retrospective study enrolled 80 prostate cancer patients from Malla reddy Medical College, Hyderabad from November 2019 to April 2021.Each instance received a Gleason score and Ki67 immunohistochemistry. Ki67 expression and Gleason score were found to be related. **Results:** All 80 patients were diagnosed with acinar/normal adenocarcinoma-WHO. There were 36 patients with moderately-differentiated tumors (45%) , 28 with high grades (35 percent), and 16 with intermediate grades. PSA levels rose as a result of GS. GS and serum PSA levels increased in direct proportion to Ki6l abeling. **Conclusion:** Ki67 is a novel biomarker linked to tumor grade and pretreatment PSA levels. It can be used as a diagnostic parameter or to replace prognostic factors.

Keywords: *adenocarcinoma, Gleason score, ki67, prognostic, biomarker, prostate cancer.*

INTRODUCTION

Cancer is the leading cause of death in the world, accounting for nearly 10 million deaths in 2020, or nearly one in every six. Breast, lung, colon, rectum, and prostate cancers are the most common. Tobacco use, a high BMI, alcohol consumption, a lack of fruits and vegetables, and a lack of physical activity account for roughly one-third of cancer deaths.

Acinar adenocarcinomas, which account for 90-95 percent of all cases, are the most common type of prostate cancer. The majority of new instances are caused by ductal carcinoma and neuroendocrine carcinoma, respectively [1]. prostate is the second leading site of cancer among males in large Indian cities such as Delhi, Kolkatta, Pune, and Thiruvananthapuram. It is the third leading site of cancer in cities such as Bangalore and Mumbai, and it is among the top ten leading sites of cancers in the rest of the population based cancer registries (PBCRs) of India. Even if the general incidence of prostate cancer is low in India, the mortality rate associated with the disease is quite high when compared to that of other nations with greater incidence rates. This is an important point to make. In addition to this, it is anticipated that the number of new cases of prostate cancer in India will increase from 34,500 in the year 2020 to 65,100 in the year 2040. [2] PSA, also known as prostate-specific antigen, is an antigen that is typically released in men. PSA is a product of the prostatic epithelium. It is a serine protease that cleaves the seminal coagulum that is generated after ejaculation and causes it to become more liquid. Only extremely minute quantities of PSA are found to be circulating in the serum of normal men. When raised PSA levels are found in the blood, a biopsy is typically recommended as the next course of treatment. This is because elevated PSA levels are associated with both the early and late stages of cancer [3]. The Gleason grading system was initially introduced by Donald Gleason in 1966, and over the course of the next 20 years, it has undergone several significant modifications. Prostate biopsies are becoming an increasingly common diagnostic tool for prostate cancer. The Gleason scoring system is used to assign a grade to the adenocarcinoma after the diagnosis has been made. Evaluation is based on grade and stage, which are the most accurate predictors of prognosis, hence they are of special importance in cases of prostatic cancer [4,5]. Several different prognostic markers can be used to determine whether a patient will survive their prostatic carcinoma (CaP). Treatment for prostatic carcinoma (CaP) varies depending on the stage of the disease. Recent research applying several immunohistochemical markers revealed that many prostatic carcinomas were either over-or under-graded using the Gleason scoring system. It's possible that the fact that it's subjective is to blame for this [4]. Because of this, researchers started looking for new markers that are more objective and can therefore accurately predict the behavior of CaPs. One of the unique markers being researched in CaP is called Ki67. Antigen Ki-67 is a nuclear non-histone protein that is expressed by cells in the proliferative stages G1, G2, M, and S. Ki-67 is an antigen that correlates to this protein [5]. The first antibody against Ki67 only worked in freshly frozen tissue slices, but researchers have since produced monoclonal antibodies that can identify formalin-resistant epitopes. Ki-67 staining and the number of mitotic divisions typically have a strong relationship with one another. 5. The Gleason grading system is an objective way of grading CaPs that is also more reproducible than the Gleason grading system. In addition to this, it is more reliable than PSA [6]. Therefore, in addition to giving a more objective approach to predicting the prognosis in cases of carcinoma of the prostate, this study was carried out to analyze the expression of Ki 67 in CaPs and its correlation with both the Gleason score (GS) and the mortality rate.

METHODOLOGY

A retrospective study enrolled 80 prostate cancer patients from Mallareddy Medical College, Hyderabad from November 2019 to April 2021.The Institutional Ethical Committee gave their approval.

Study duration: The duration for the study was 18 months (Nov 2019-April 2021).

Sample size: Present retrospective study enrolled 80 prostate cancer patients.

Inclusion criteria:

1. Archived cases of prostate carcinoma
2. All needle core biopsies of the prostate, TURP received in department of pathology and diagnosed as carcinoma prostate.

Exclusion criteria: Benign prostate hyperplasia

Sample collection- Tissue from patients presented as needle biopsies and TURP chips as specimens was assessed by histopathological examination for present retrospective study.. For the retrospective study, paraffin-embedded blocks and slides of CaP samples retrieved from the archives of the pathology department were used. A detailed clinical history, PSA levels, and other relevant clinical information were obtained and entered into the proforma for every case. Immunohistochemistry for Ki 67 was done on the blocks.

Sample processing- Tissues were fixed in 10% neutral buffered formalin (NBF) for an average of 24 hours after receipt. TURP chips and needle biopsies were completely processed. The pieces were processed in Microme histokinette, paraffin embedded with an automated device, and sections (4-5 micron thickness) were cut with a MICROM microtome equipped with a section transfer system. Sections were placed on slides and stained with hematoxylin and eosin (H&E). All of the blocks underwent immunohistochemistry (IHC) for Ki 67 using a horse radish peroxidase-labeled polymer technique. The histological type of malignancy was determined using hematoxylin and eosin (H&E) from needle biopsies and TURP specimens. The tumor was histologically classified according to WHO guidelines. The Gleason scoring system for prostate assigned them a Gleason score. Gleason score is calculated by adding two numbers: the first is the grade of the most common tumor pattern (primary grade), and the second is the grade of the second most common pattern (secondary grade). There are five Gleason patterns and a Gleason score range of 2 to 10. GS were divided into four categories: Scores 2-4 indicate welldifferentiated cancer, 5 and 6 indicate intermediate-grade cancer, 7 indicate moderate-to-poorly differentiated cancer, and 8-10 indicate high-grade cancer.

Immunohistochemistry

Sections from each biopsy specimen were immunohistochemically stained for Ki-67 with a pre-diluted anti-Ki-67 antibody (DAKO Corp., Clone MIB-1) using the peroxidase-anti peroxidasee method and H_2O_2-diaminobenzidine as the substrate-chromogen. Before incubation with the primary antibody, the material was processed by antigenic unmasking in

Tris-EDTA buffer at pH 9.0 in a pressure cooker at 120 deg. The percentage of Ki-67positive cells was graded semi-quantitatively based on the number of labelled cells detected. Each slide was examined at 4X10 magnification to identify locations with the greatest number of positive cells. The areas were then analysed at 400X magnification to determine the fraction of positive cells to total cells. Only cells that were absolutely positive for the relevant marker were considered after counting at least 500 cells. Strong and full brown-yellowish nuclear colouring was required for Ki67 positive. The nuclei of stromal cells and lymphocytes stained with the dye were not counted.

As a positive internal control, basal cells from nearby non-neoplastic prostate glands and colonic epithelium were used. The step involving the primary antibody was skipped for the negative control.

Table 1- Grading criteria used for assessing Ki67 immunolabelling index**.**

Percentage of cells	Grading
<3%	Negative
3- 25% of labeled cells	Weak(+)
25-75%	Moderate(++)
> 75%	Intense(+++)

Statistical Analysis

The results were analysed using SPSS software version 9.0. Descriptive statistics were done for age distribution, distribution of clinical features among study cases, ultrasonography findings, digital rectal examination findings, bony metastasis, types of the specimen and perineural invasion, PIN, Ki-67 expression, PSA levels, and Gleason's grading. The Spearman's correlation test was used to evaluate correlations between Gleason's grading and Ki-67 expression; between Gleason's grading and PSA level; and between Ki-67 and PSA level. ANOVA was used to analyze the Ki-67 immunolabelling index and PSA level between different Gleason's grades. This study's P-value of < 0.05 was considered statistically significant.

RESULTS

Eighty cases of prostate carcinoma were studied at the Department of Pathology, Mallareddy Medical College, over a period of 18 months. Both biopsies and TURP cases were included in the study. The histopathology of all 80 cases was looked at, and Ki67 expression was looked at in relation to the Gleason score and serum PSA.

Age distribution

The age of patients ranged from 35 to 88 years, with a mean age of 66.5 years. The maximum number of cases was seen in the age group of 61–70 years and the least number of cases was seen in the age group of 31-40years, as shown in the following table.

Table 2 Age distribution of cases

Age	No .of patients	Percentage(%)
31-40	1	1.25
41-50	2	2.5
51-60	20	25
61-70	28	35
71-80	21	26.25
81 & above	8	10
Total	**80**	**100**

Clinical features-

In this study 51 cases (63.75%) of patients presented to urology OPD with complaint of urinary retention .Around 26 cases (32.5 %) of patients presented with history of hesitancy and rest with history of rectal bleeding and backache.

Table .3 Distribution of cases based on clinical features

Clinical features	No.of patients	Percentage(%)
Urinary retention	51	63.75
Hesitancy	26	32.5
Rectal bleeding	2	2.5
Backache	1	1.25
Total	**80**	**100**

Ultrasonography(USG) findings-

In this study 56.25% of patients had grade II prostatomegaly as diagnosed by ultrasonography. Grade III prostatomegaly was seen in 16.25% of patients included in the study

Table 4. Distribution of cases based on USG findings		
USG findings	**No.of patients**	**Percentage(%)**
grade I	22	27.5
grade II	45	56.25
grade III	13	16.25
Total	**80**	**100**

Digital rectal examination-

Digital rectal examination was abnormal in 37.5 % of cases.

Table 5. Distribution of cases based on digital rectal examination.		
DRE	**No.of cases**	**Percentage (%)**
Abnormal DRE	30	37.5
Normal	50	62.5
Total	**80**	**100**

Presence of bony metastasis-

Bony metastasis was diagnosed in 27.5 % of cases with remaining 72.5 % of patients had carcinoma confined to prostate.

Table 6 Distribution of cases based on presence of bony metastases.		
Distant metastasis	**No .of cases**	**Percentage(%)**
Present	22	27.5
Absent	58	72.5
Total	**80**	**80**

Distribution of cases based on PSA levels

The mean PSA was 128.00 ± 63.97 ng/ml. Only 7 of patients had a PSA value >201 with maximum value of 239ng/ml. The minimum value of PSA was 1.46ng/ml and 09of patients had value between 1 -50.99ng/ml. Majority of patients had values between 151 and 200ng/ml.

Table 7 Categorization of cases based on PSA level		
PSA(ng/ml)	**No. of patients**	**Percentage**
1.0-50.99	09	11.25
51-100.99	21	26.25
101-150.99	20	25
151-200.99	23	28.75
>201	07	8.75
Total	**80**	**100**

Type of specimens-

72.5 percent of specimens were from biopsy and remaining 27.5 % of specimens were from TURP.

Table 8 Distribution of cases based on type of specimens		
Type of specimens	**No .of cases**	**Percentage(%)**
Biopsy	58	72.5
TURP	22	27.5
Total	**80**	**100**

Histological type according to WHO classification-

Table 9	**Histological type of Prostate cancer**	
Histological type	**No .of cases**	**Percentage(%)**
Acinar/Usual adenocarcinoma	80	100

Classification of prostate adenocarcinoma according to Gleason score-

All cases were assigned a Gleason score by assessing primary pattern and secondary pattern as per study methodology and grouped into four categories. Adenocarcinoma with

score 7 constituted 36 % of cases. High grade (8 &above) were seen in 35% of cases. One case had tertiary component with grade 2 in a TURP specimen which constituted <5%. According to WHO criteria, this was insignificant hence was not considered. No well differentiated patterns were observed.

Table 10 Distribution of cases as per Gleason's grading system		
Gleason score	**No. of Cases**	**Percentage**
Well differentiated (2-4)	0	0
Intermediate grade (5&6)	16	20
Moderately differentiated (7)	36	45
High grade (8 &above)	28	35
Total	**80**	**100**

Distribution of cases based on Gleason's score in different age groups-

Maximum number of cases (30 %) were in age group of 61-70 and majority of cases were Gleason score of 7, majority of cases were moderately differentiated. With increasing age there was increase in the Gleason score. No case was found in the Well Differential (2-4) Gleason score.

Table 11 Distribution of cases based on Gleason's grade in different age group				
	Gleason's score			
	Intermediate grade (5&6)	**moderately differentiated(7)**	**high grade(>8)**	**Percentage(%)**
31-40	1	0	0	1
41-50	0	1	1	2
51-60	4	9	. 7	20
61-70	5	16	07	28
71-80	4	6	11	21
81 & above	2	4	2	8
Total	**16**	**36**	**28**	**80(100 %)**

Distribution of PSA levels in relation to Gleason score-

The distribution of PSA levels in different categories of Gleason score groups showed that majority of intermediate grade tumors had PSA levels between 51-100.99ng/ml Moderately differentiated tumors had PSA levels between 101-150.99ng/ml, high grade tumors had PSA between 151-200.99ng/ml. A statistically significant correlation was

observed between PSA level and Gleason's grade (Spearman correlation test) with p value of 0.0001 and correlation coefficient of +0.715.

There was a statistically significant (P value <0.05) difference in mean PSA levels between different Gleason's grade with mean ± SD value of 61.30 ± 35.05, 115.40 ±45.3 and 172.5 ± 55.02 in intermediate grade, moderately differentiated and high grade tumors respectively. Thus, with increasing grade the PSA levels also increased.

Table 12 Distribution of cases based on PSA levels and Gleason's score

	PSA (ng/ml)						
Gleason's grade	**1.0-50.99**	**51-100.99**	**101-150.99**	**151-200.99**	**>201**	**Total**	**(%)**
Well differentiated	0	0	0	0	0		0
Intermediate grade	07	07	1	1	0	16	20
Moderately differentiated	02	13	14	3	4	36	45
High grade	0	01	5	19	03	28	35
Total	**09**	**21**	**20**	**23**	**7**	**80**	**100**

Ki67 immunolabelling index in prostatic adenocarcinomas-

The 80 cases of CaP were immunohistochemically stained with Ki-67 antibody for evaluating Ki-67 immunoexpression. Majority of the cases (85%) of cases had moderate Ki-67 expression with mean labeling index of 46.8 ± 15.88 %.

Table 13: Distribution of cases based on Ki-67 expression.

Ki67	**No .of cases**	**Percentage**
2-25%(weak)	09	11.25
25-75%(moderate)	68	85
>75%(intense)	3	3.75
Total	**80**	**100**

Ki67 immunolabelling index in relation to PSA levels-

Ki67 expression in relation to various ranges of PSA showed that with increasing levels of PSA the percentage of cases showed a significant increase in Ki-67 expression with a P value of 0.0001 and Spearman's correlation coefficient of +0.346. More than 75% immunolabelling of Ki67 was noted only in the patients with serum PSA of 151 and above.

	Table 14. Distribution of cases based on Ki 67 expression and PSA level				
PSA(ng/ml)	**Ki67**				
	2-25%	**25-75%**	**>75%**	**Total**	**Percentage**

1.0-50.99	01	08	0	09	15
51-100.99	03	18	0	21	27.5
101-150.99	05	15	0	20	23.75
151-200.99	0	22	1	23	22.5
>201	0	05	2	07	11.25
Total	**09**	**68**	**03**	**80**	**100**

Fig 1: Microphotograph showing normal (left) and malignant (right) prostatic glands. (H&E 10x40)

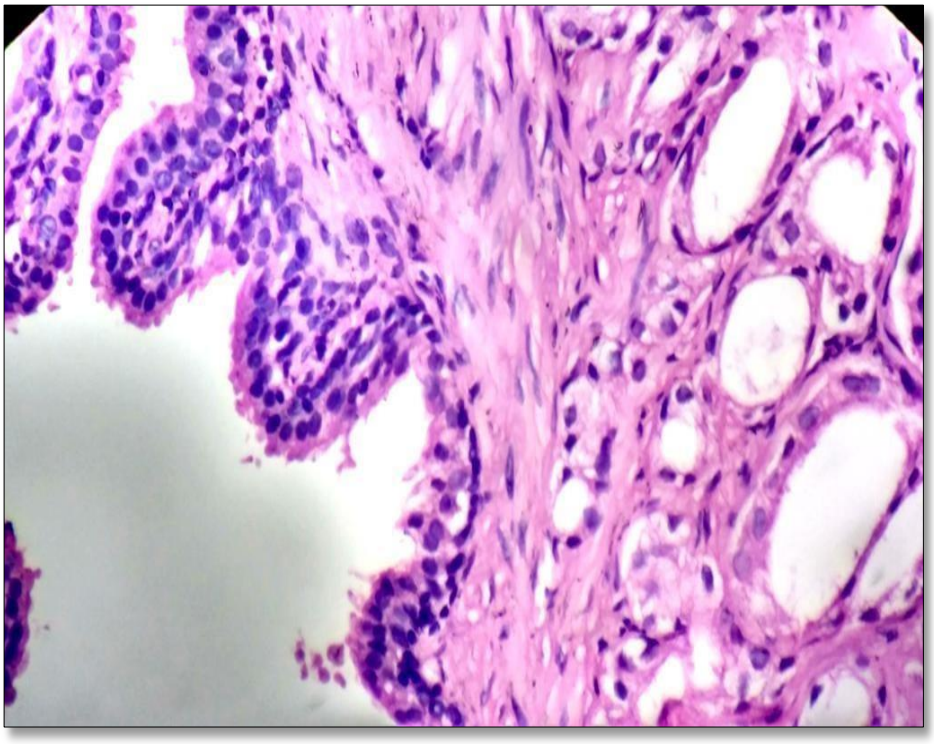


Fig. 2: Microphotograph showing Gleason pattern 2 (Single separate glands, loosely with less defined sharp edge) (H & E packed 10x4)

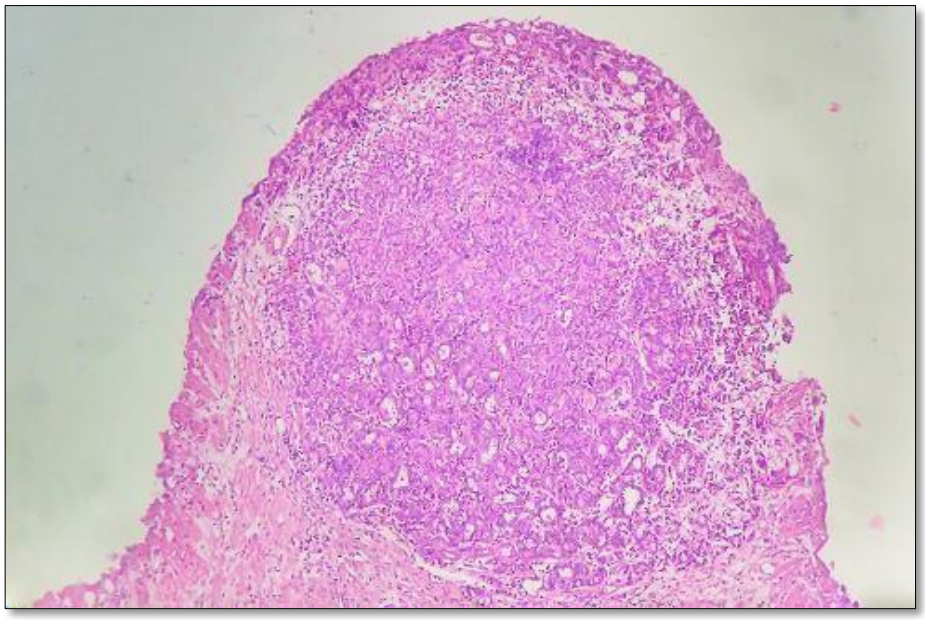


Fig 3: Microphotograph showing Gleason pattern 3(irregularly separated closely packed glands of varying sizes with poorly defined edge)(H&E 10x4)

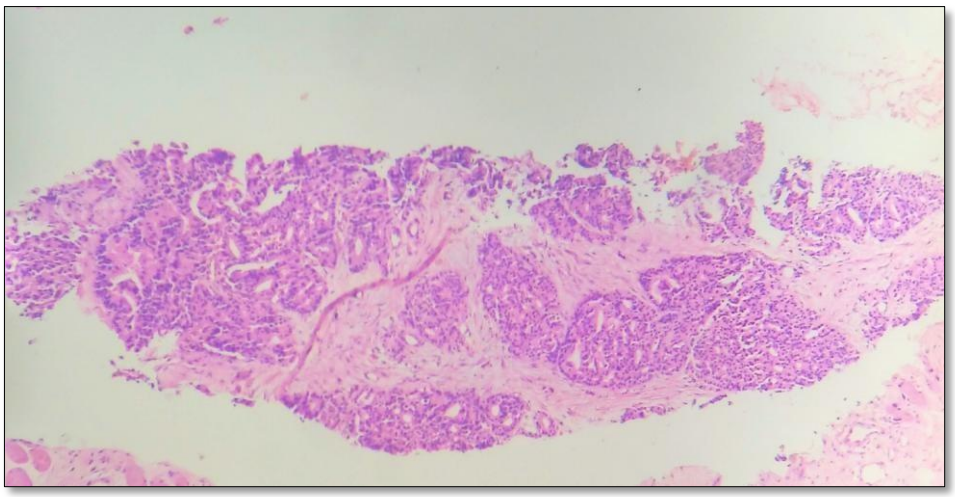


Fig. 4: Microphotograph showing Gleason pattern 3 with normal adjacent bening with double layered epithelium (left). (H & E packed 10x10)

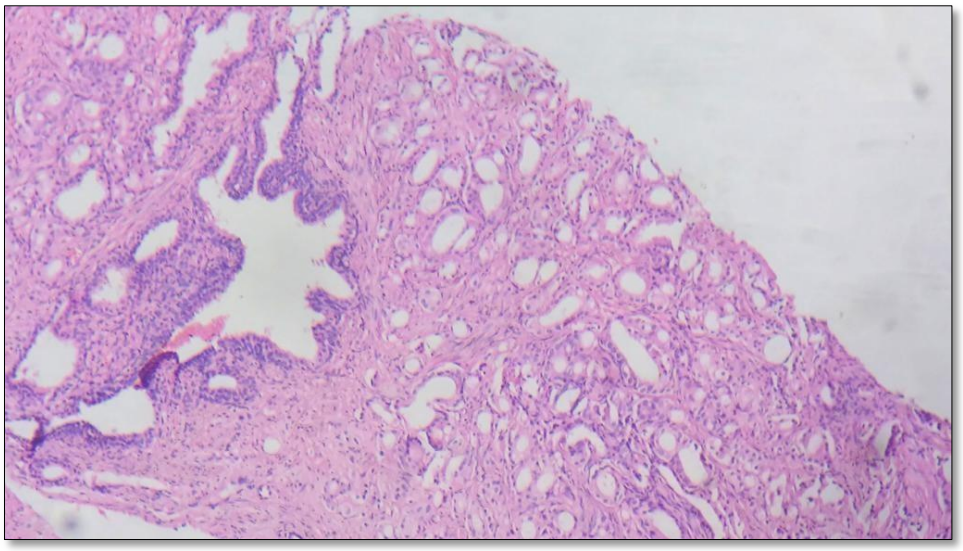


Fig 5: Microphotograph showing Gleason pattern 3 (loosely arranged glands of varying sizes). (H&E 10x40)

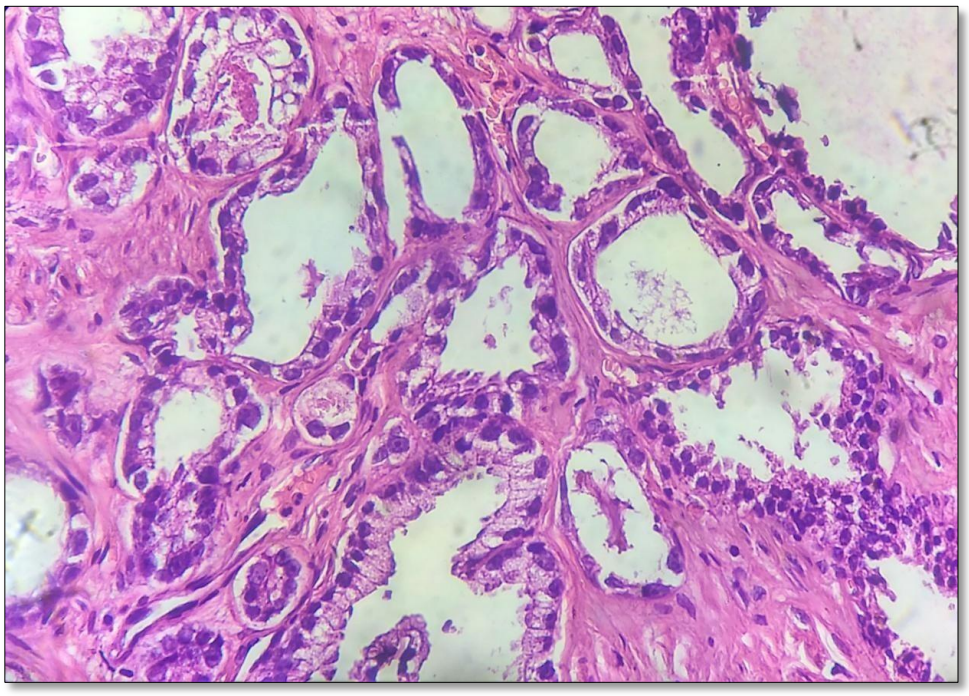


Fig. 6: Microphotograph showing Gleason pattern 4 (raggedly outlined, raggedly infiltrating fused glands). (H & E 10X40)

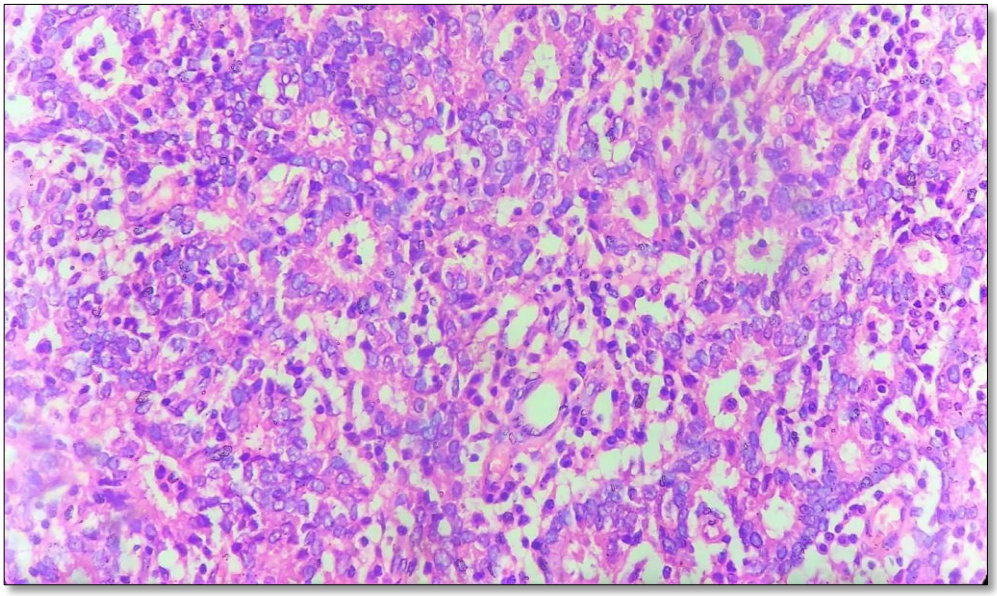


Fig 7: Microphotograph showing Gleason pattern 4 (hypernephroid pattern). (H&E 10x40)

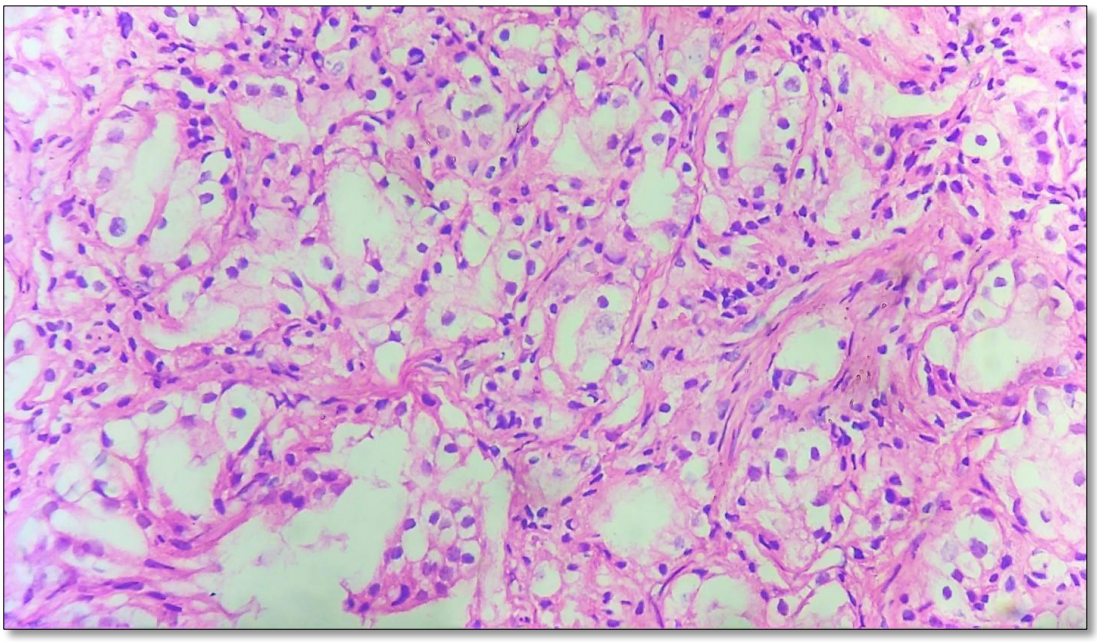


Fig 8: Microphotograph showing Gleason pattern 4 (fused glands).(H&E 10x40)

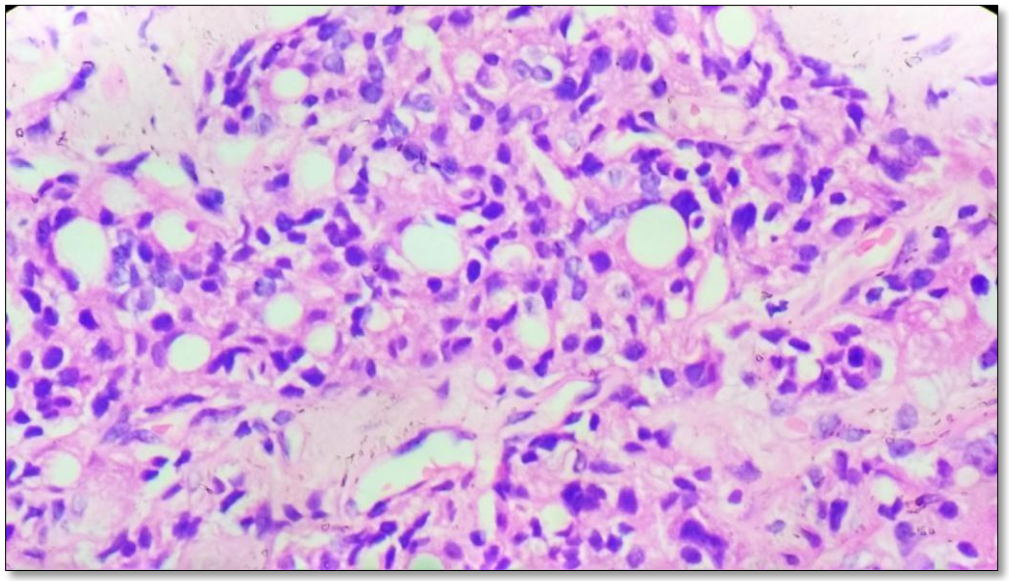


Fig 9: Microphotograph showing Gleason pattern 5 (solid sheet of cells). (H&E 10x40)

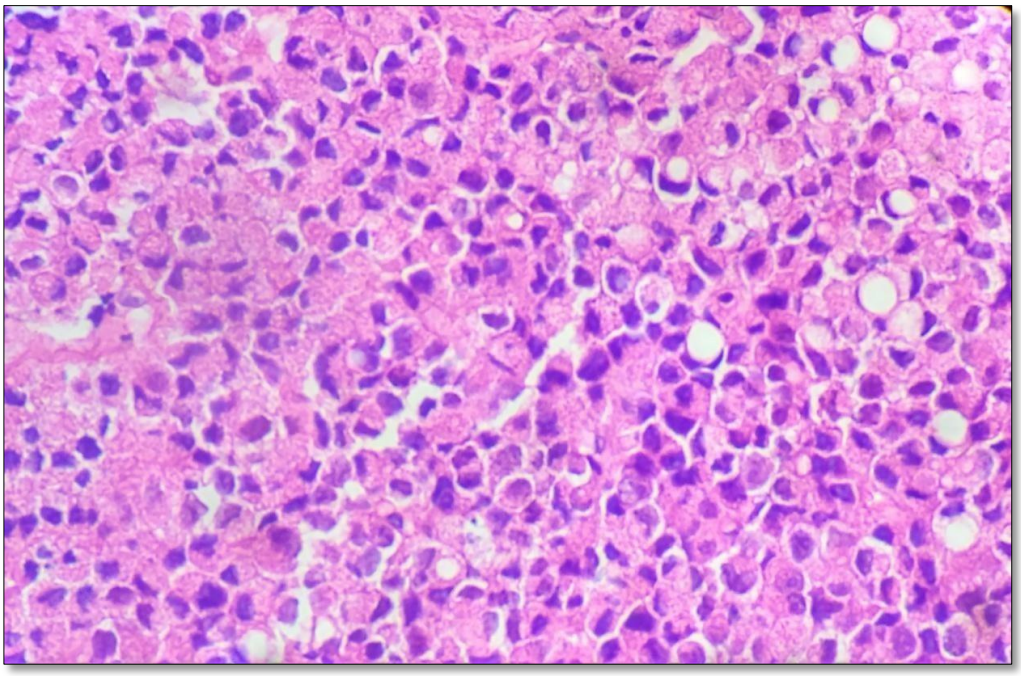


Fig 10: Microphotograph showing Gleason pattern 5 (single pleomorphic cells) (H & E 10x40)

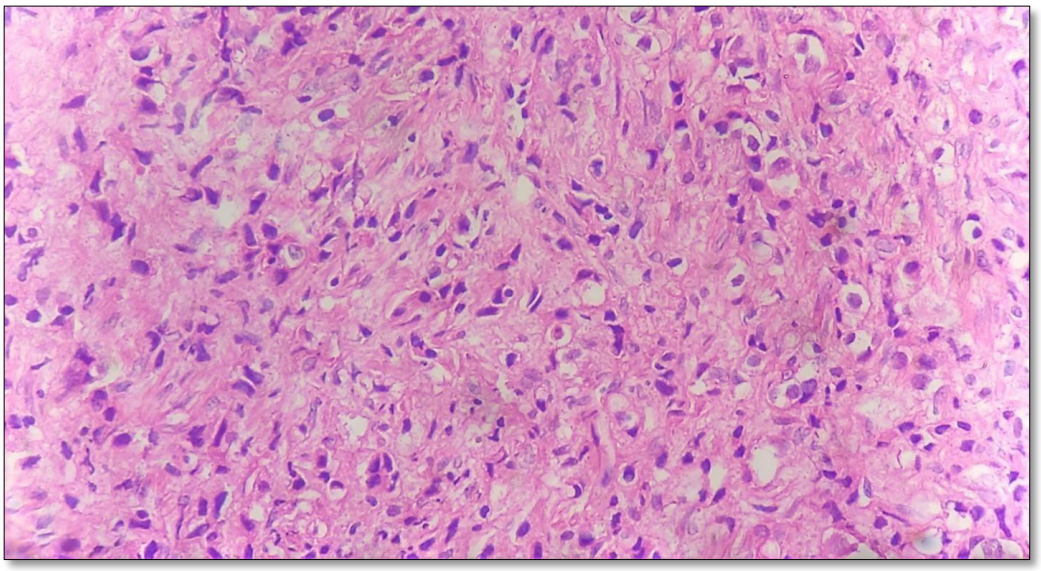


Fig 11: Microphotograph showing malignant glands exhibiting nuclear pleomorphism. (H & E 10x40)

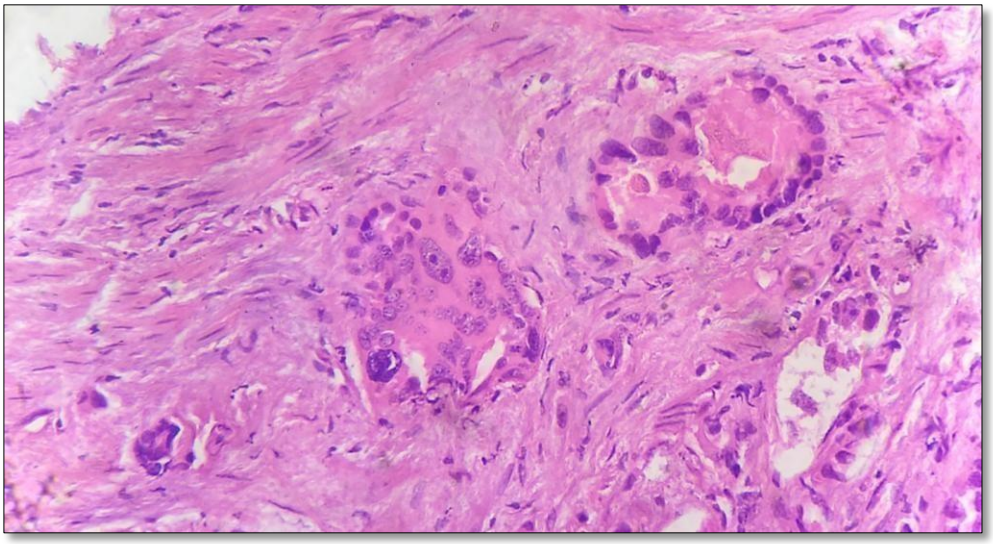


Fig 12: Microphotograph showing prostate intraepithelial lesion. (H&E 10x10)

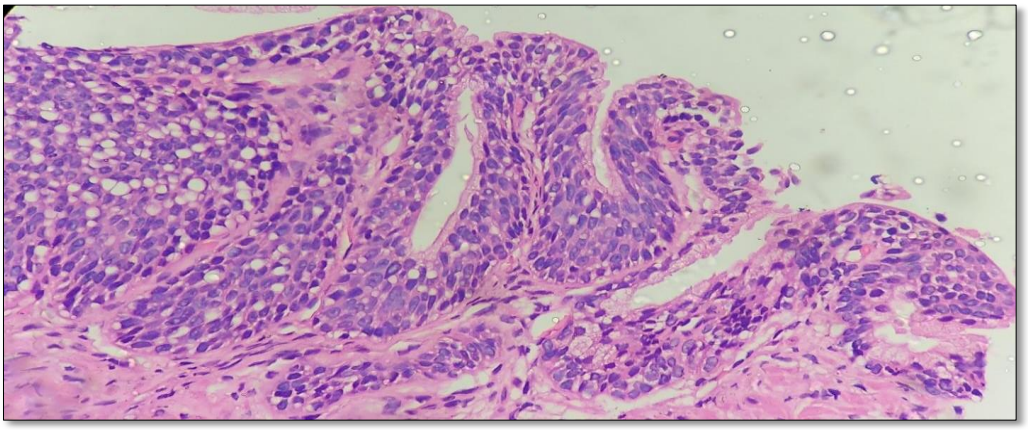


Fig 13: Microphotograph showing prostate intraepithelial lesion (cribriform pattern). (H&E 10x10)

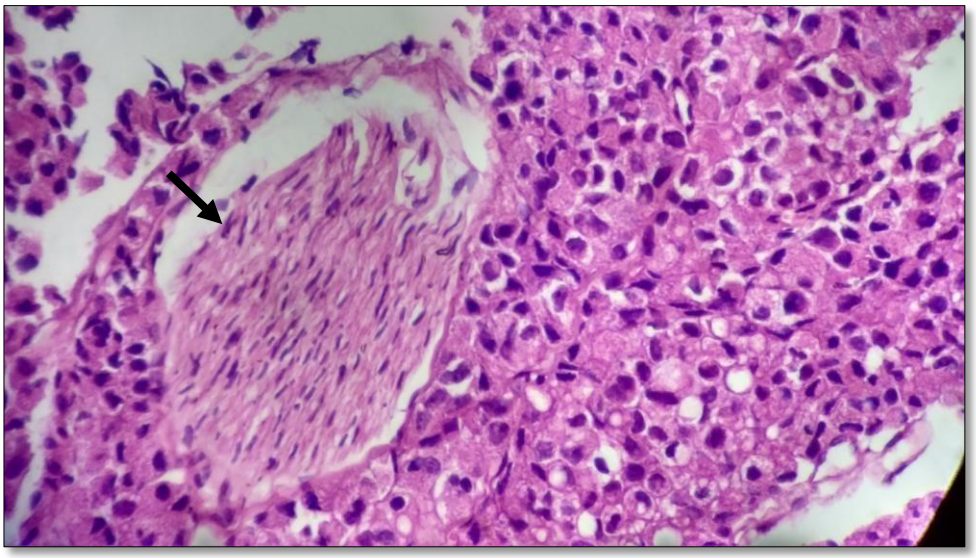


Fig. 14: Microphotograph showing periueural invasion (H & E 10x40)

Fig 15: Microphotograph showing numerous foci of perineural invasion (shown by arrow). (H&E 10x4)

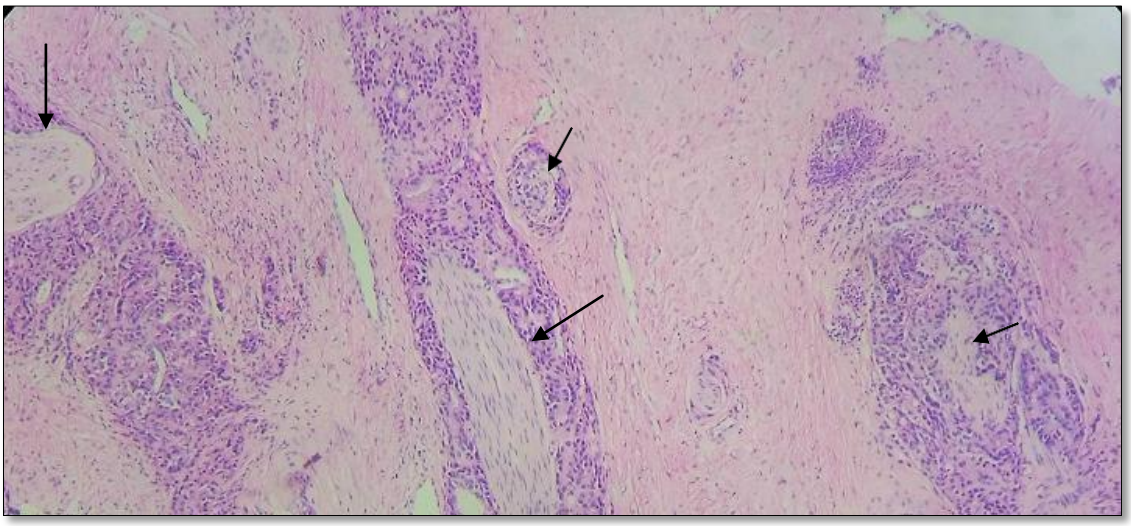


Fig 16: Microphotograph showing perineural invasion. (H&E 10x40)

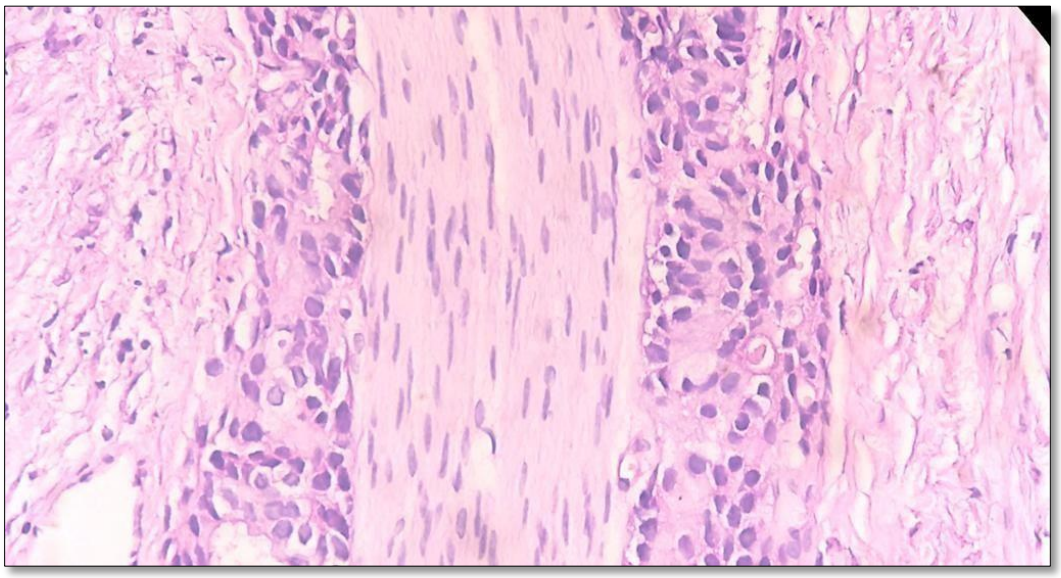


Fig 17: Internal control for Ki67-colonic epithelium (IHC-10x4)

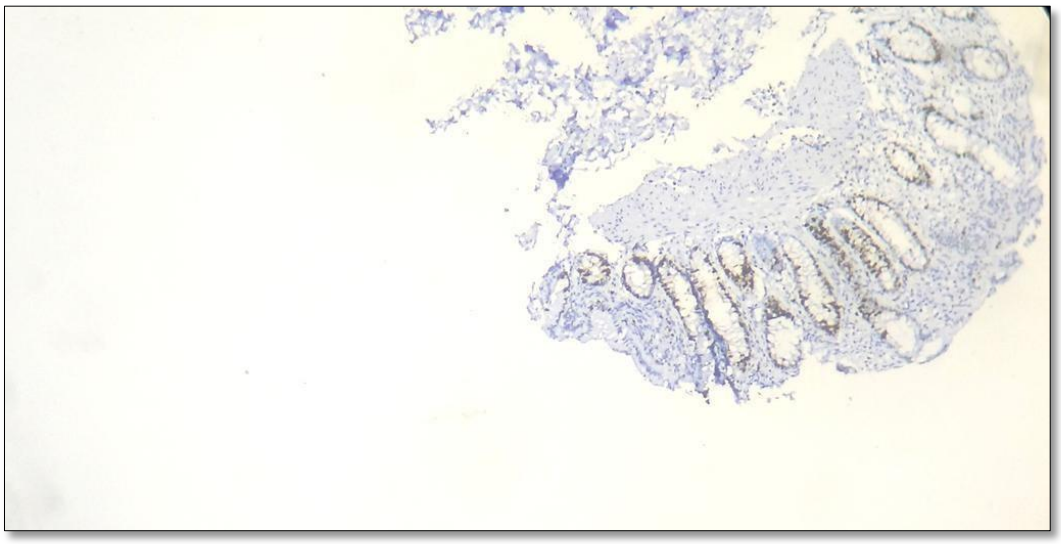


Fig 18: Internal control for Ki67 colonic epithelium(positive nuclear staining) (IHC 10x40)

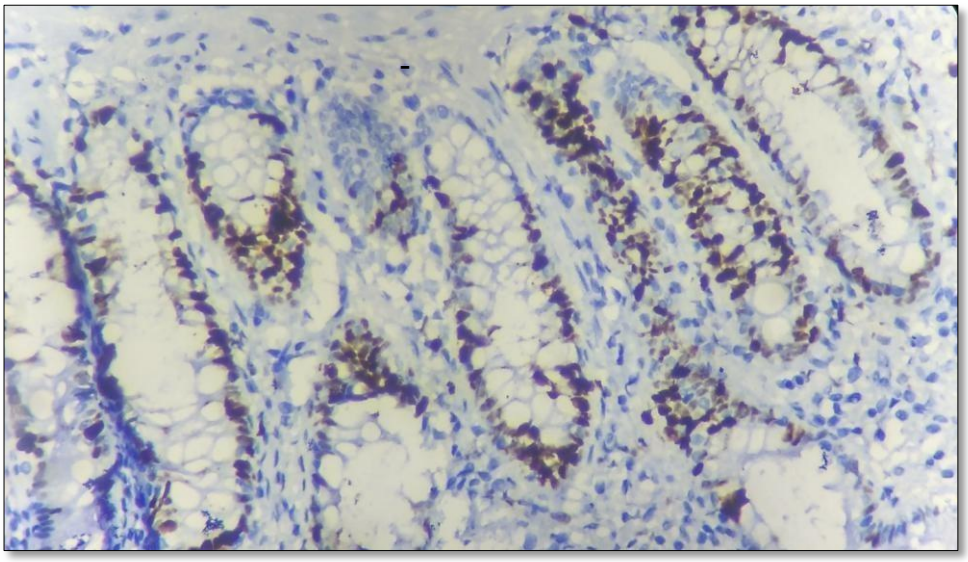


Fig 19: Ki67 positivity in nuclei of single malignant prostatic gland (IHC 10x40)

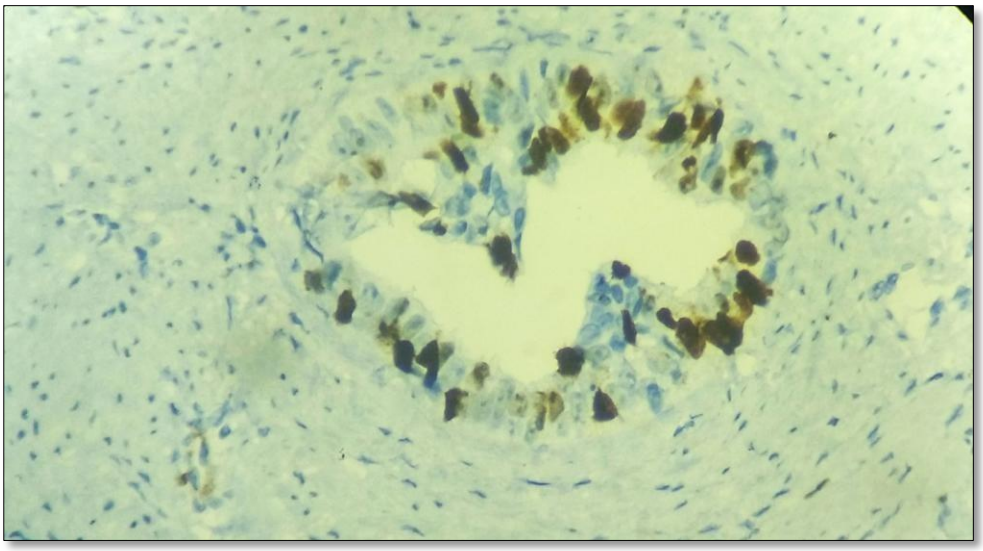


Fig. 20: Areas of PIN stained with Ki67 antihody (IHC 10x10)

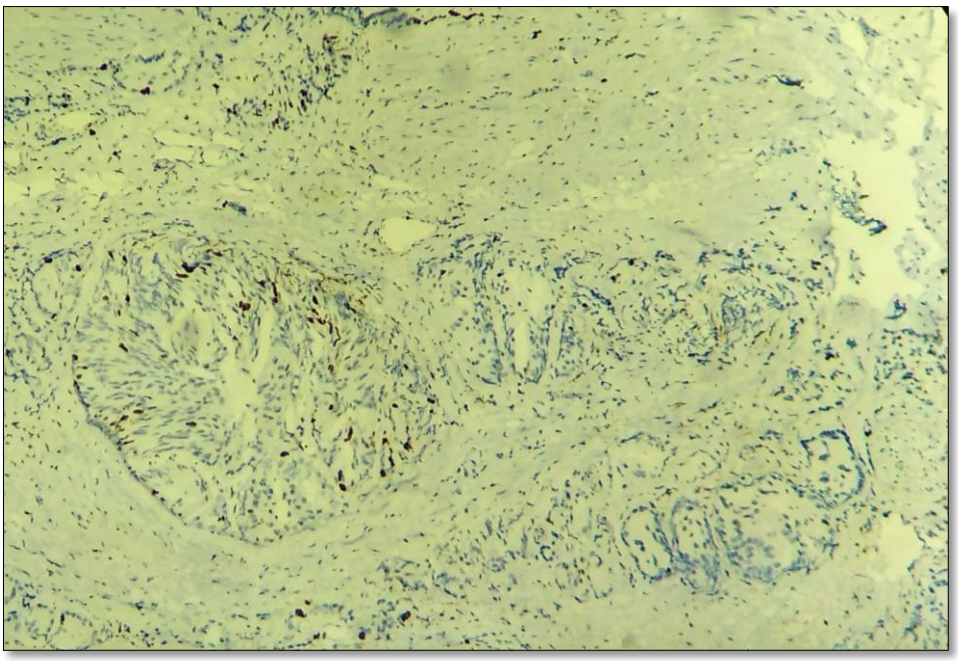


Fig 21: Tumor cells stained with Ki67 antibody around a foci of perineural invasion (IHC 10x40)

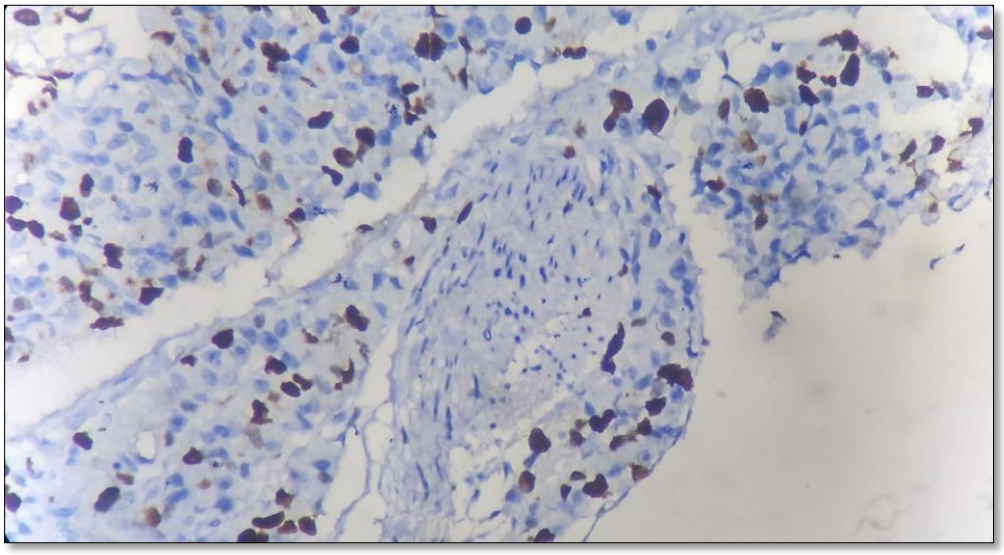


Fig. 22: Ki67 positivity (+) in Gleason pattern 3. (IHC 10x10)

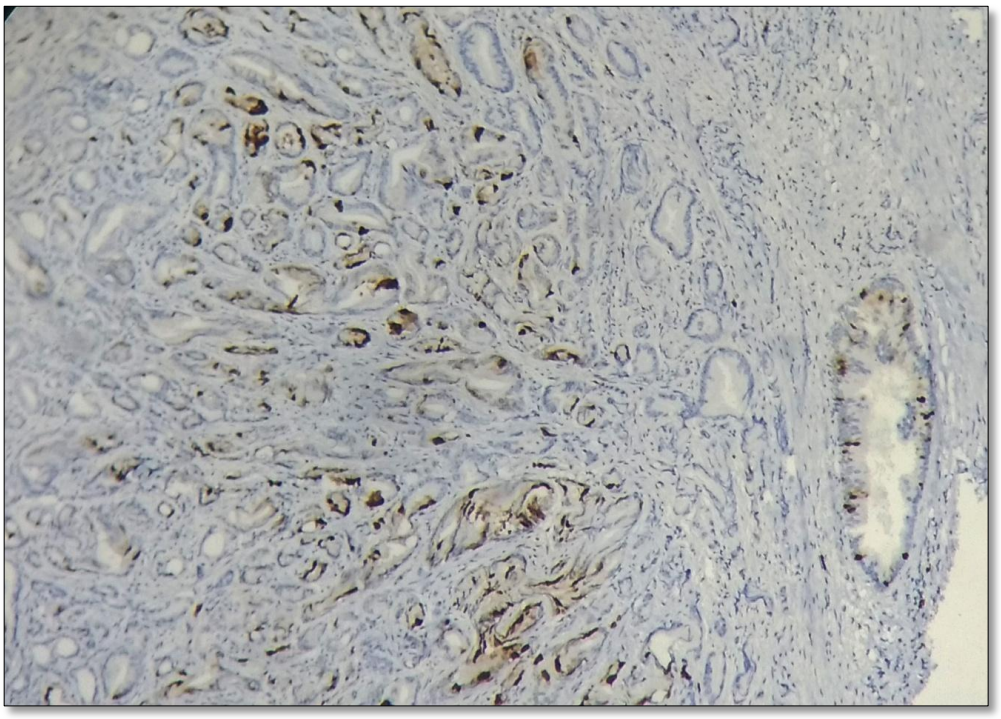


Fig23: Ki67 positivity(++) in Gleason pattern 3-cribriform pattern. (IHC 10x40)

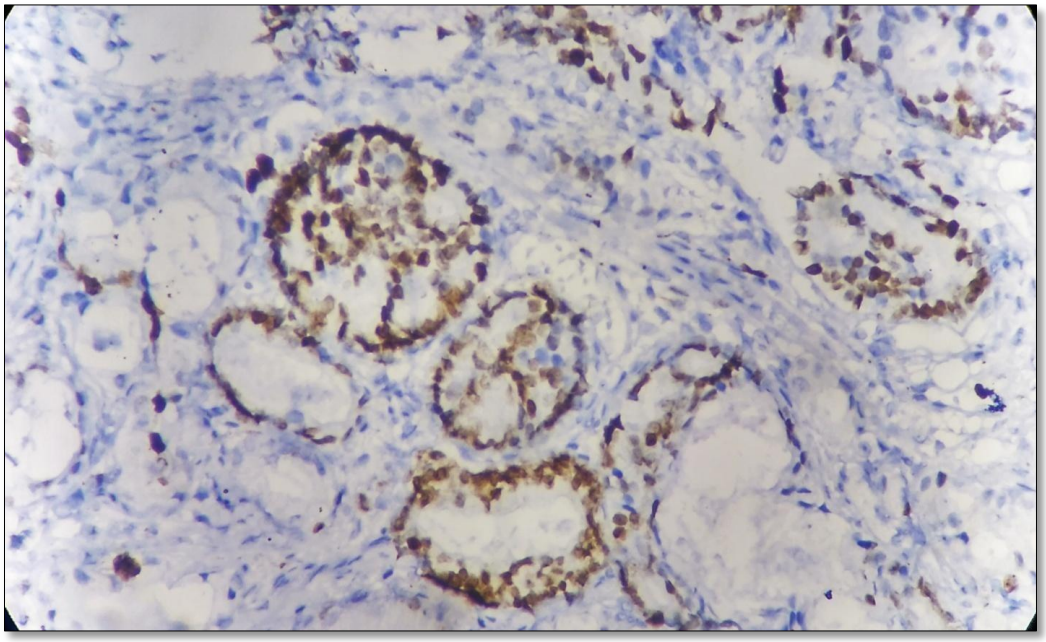


Fig 24: Ki67 positivity(+) in Gleason pattern pattern 4 (IHC 10x40)

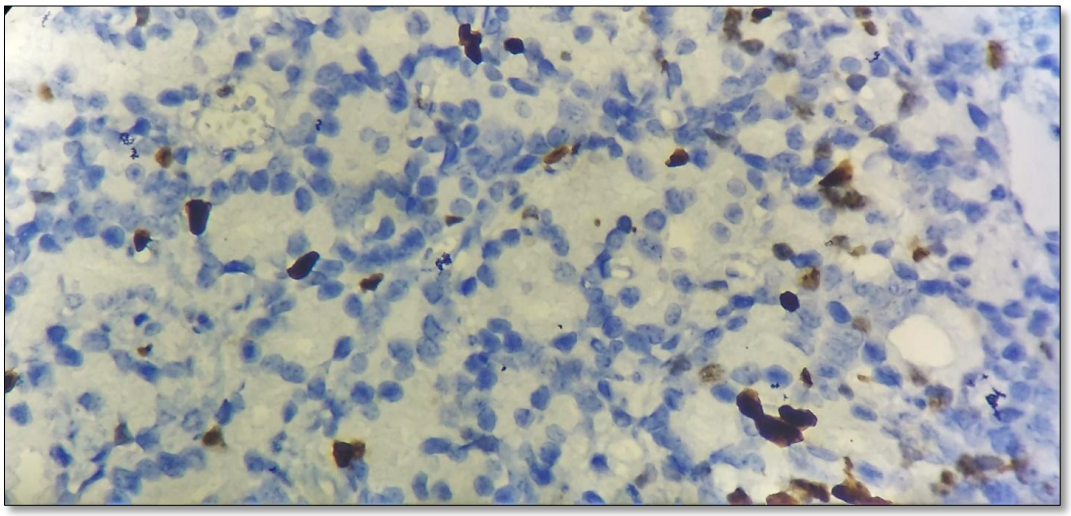


Fig 25: Ki67 positivity(+) in Gleason pattern 4.(IHC 10x40)

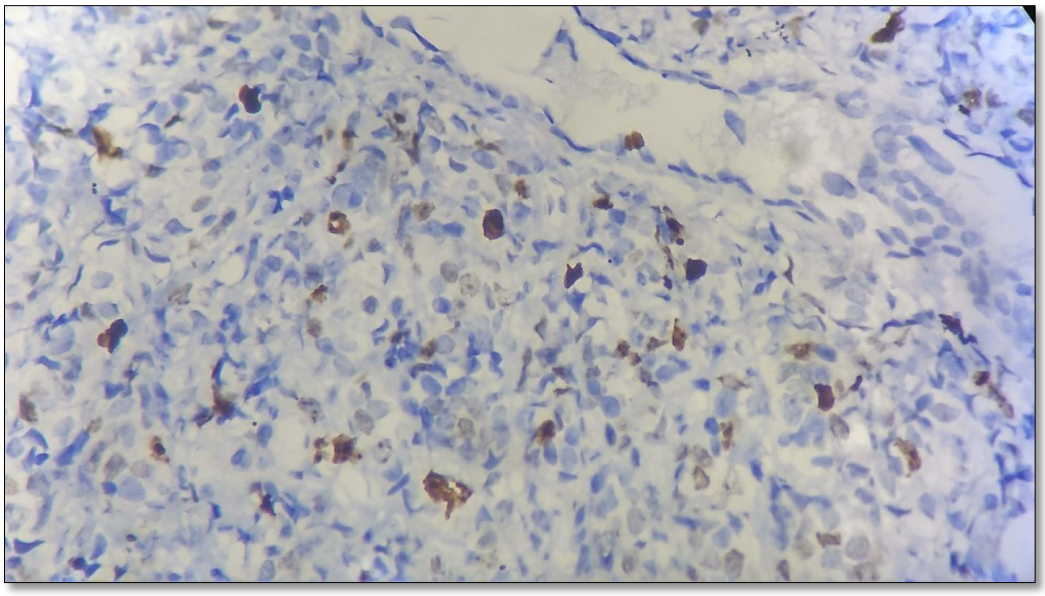


Fig 26: Ki67 positivity in Gleason pattern 4 (++). (IHC 10x40)

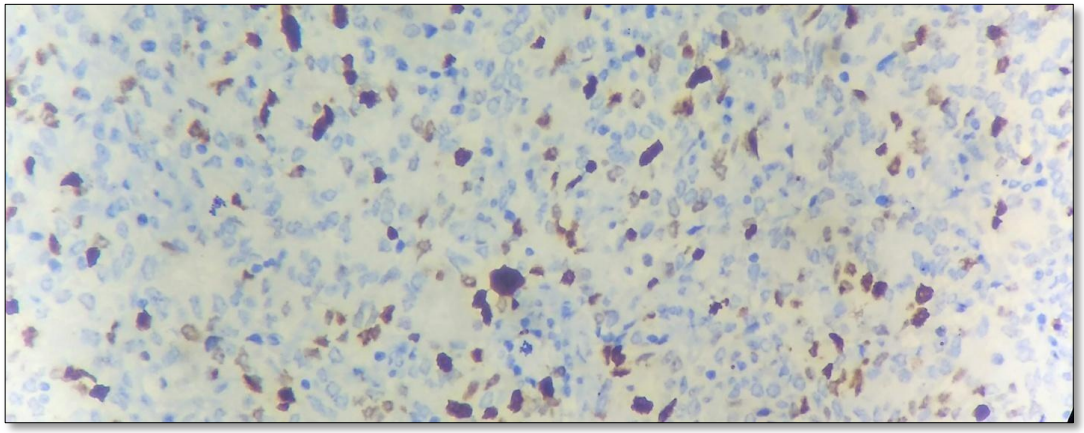
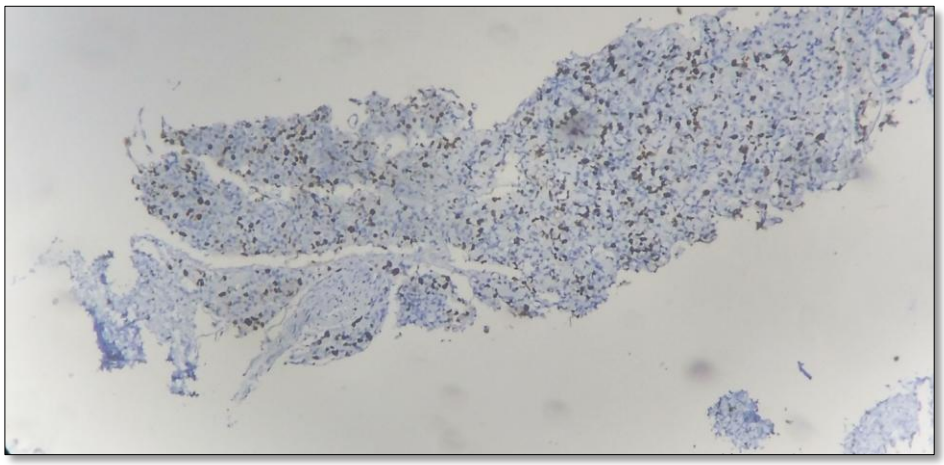


Fig 27: Ki67 positivity(+++) in Gleason pattern 5.(IHC 10x4)



DISCUSSION

Distribution of Ages

One of the most important risk factors for prostate cancer is ages of patients. Prostate cancer is becoming more common as people get older [1]. Pandey et al. [7] study subjects ranged in age from 61 to 70 years, with a mean age of presentation of 64.9 years. The average age in the current study was 66.5 years. This is similar to the work of Verma et al. [8]. In other research, the mean age may be lower due to excellent standards of health care resulting in early identification due to screening of men after the age of 45 in industrialized countries.

Clinical features:

Carcinomas that develop peripherally and distant from the urethra are asymptomatic, but advanced prostatic carcinomas cause urinary symptoms such as urine retention, hesitation, frequency, and dysuria. Because of spinal metastases, metastatic illness can cause back pain. [9]. The Pandey et al. [7] study found that the bulk of the 27 instances (66.66 percent) were prostatectomy specimens, with the remainder being needle biopsies (33.33 percent). This was comparable to the findings of Josephine et al. [10], who found that 42 percent of needle biopsies and 58 percent of resection specimens were positive. In these patients, acute urine retention (67%) was the most common sign, followed by dysuria (19.4%). In a study by Josephine et al., dysuria (81%) was the most common sign. Urinary retention was the most common complaint of CaP wage-matched age-matched controls and was similar to the research conducted by Hamilton et al. [12]. CaP detection by digital rectal examination has limited sensitivity and specificity. In one study, Ojewola et al [12] discovered that 79.41% of CaP paan patients had abnormal digital rectal examinations. In the current study, 37.5 percent of CaP cases had abnormal digital rectal examination. The digital rectal examination findings are influenced by tumor location because DRE only detects cancers in the posterior region, which may be one of the reasons for variable data. Boindicate metastases indicate stage IV illness with a poor prognosis [16]. Thirty-three percent of cases in the current investigation exhibited bone metastases, which was comparable to the figure reported by Bubendorf et al [13]. The mean PSA values in several trials varied significantly. In their study, Antonarakis et al. [14] discovered a low value of around 20.33ng/mL. The mean PSA level in prostate cancer in our study was 128 ng/ml. In our investigation, one case fell below the cutoff value. This diversity may be explained by the diverse age groups, varying numbers of cases in each study, and the mix of tumours of different grades in each study. Perineural invasion is a category III prognostic feature that is linked to a higher rate of extraprostatic extension and aggressive phenotypes. Data varies among research, with a maximum percentage of around 90% in a Merrilees AD et al [15] study. In the current study, 47.5 percent of CAPs had perineural invasion. Studies with a greater number of welldifferentiated well-differentiated tumours had lower percentages of PNI evidence, whereas studies with a greater number of high-grade tumours had higher percentages of PHI evidence. We had 28 cases of high grade tumours; therefore, this accounted for 35% of the cases with PNI. In many investigations into Ki67 expression in prostate cancer, the total percentage of cases in each score was calculated. Because the Gleason grading method is the most important prognostic factor in CAP, various investigations into developing biomarkers

are conducted in conjunction with the Gleason score. According to the Alharabi et al study [16], the typical acinar adenocarcinoma component is usually very poorly differentiated with Gleason scores of 9 to 10. Several techniques have been developed for classifying Gleason scores into prognostic groups. Gleason scores 2–4 behave similarly and can be classified. Gleason scores of 8–10 are commonly clubbed together because they show weakly differentiated cancers. Gleason score 7 is a separate entity with a prognosis halfway between Gleason scores 5-6 and 8-10. 9As a result, we divided the patients into four groups, with Gleason scores of 2-4 representing well-differentiated tumours, 5 & 6 representing intermediate grade tumours, 7 moderately differentiated tumours, and 8 and above representing high grade tumours. Madani et al. [17] found the greatest number of high-grade malignancies. Our patient group is similar to that of Fisher G7, but with a higher proportion of moderately differentiated tumors. Fisher G et al [18] and Madani et al [17] found that the maximum number of patients with positives ranged from 2 to 25%. Our findings were similar to those of Munoz et al. (16), with a Ki67 immunolabelling index in the 25–75 percent range in the majority of cases (85%). Mesko et al. [19] concluded in their study that the disparity in data is due to the lack of widely accepted criteria for rating Ki67. The fact that each study included a different number of patients with varying Gleason scores may also have contributed to the variation. Another reason for reporting a lower percentage of the Ki67 labelling index is its heterogeneity profile. According to the findings of the Pandey et al. [7] study, the Ki-67 index was positive in 6 of the 8 patients (29.6%) who had serum PSA levels greater than 20ng/ml (75%). A high Ki67 index was found in ten of sixteen cases (59.2%), with blood PSA levels ranging from 4.1 to 20ng/ml (63%). There was no significant ($p > 0.05$) relationship between serum PSA levels and Ki-67 in prostate adenocarcinoma cases. Gurumurthy et al. [20] discovered a correlation between serum PSA levels and Gleason grade. 21) discovered a strong relationship between serum PSA levels and GS. Gündoduet al. [22] established a positive association between serum PSA levels and GS. In this study, as grade went up, serum PSA levels went up, which was statistically significant. High grade tumours or tumours with limited differentiation have been linked to lower serum PSA levels. Outliers form and the prevalence of such events in a study may impact the correlation between the two variables [23,24]. We studied an 80-person sample size, and there were 28 (35%) occurrences of high-grade tumors, with fewer outliers. Because the sample size was bigger and there were more high-grade tumors, these factors had less of an effect, which led to the significant findings.

CONCLUSION

The prevailing histological grade, as determined by the Gleason scoring method based on primary and secondary patterns in the tumour, determines therapy and prognosis. Ki67 labelling index, a novel anciliary index, might aid in the better categorization of these malignancies. Ki67, a proliferative marker, is expressed in different amounts by tumour cells of prostatic adenocarcinoma and increases with increased tumour grade and blood PSA levels. As a result, the Ki67 immunolabelling index can be used in conjunction with or as a

substitute for the Gleason grading system to aid in therapeutic intervention and prognostication of prostatic carcinomas.

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Conflict of Interest

None

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