NVEO
Natural Volatiles &
Essential Oils

Prostatic Lesions: Histopathological Study In A Tertiary Care Hospital

Mangesh Kohale, **Anupama Dhobale**, **Obaid Noman**, **Neha Bhatt**, **Shweta Bahadure**, **Pratibha Dawande**,

1 Assistant Professor, Dept. of Pathology Datta Meghe Medical College, (Datta Meghe Institute of Medical Sciences Sawangi (Meghe) Wardha)

2 Assistant Professor, Dept. of OBGY Datta Meghe Medical College, (Datta Meghe Institute of Medical Sciences Sawangi (Meghe) Wardha)

3 Associate Professor, Jawaharlal Nehru Medical College, (Datta Meghe Institute of Medical Sciences Sawangi (Meghe) Wardha)

4 Associate Professor, Dept. of Pathology Datta Meghe Medical College, (Datta Meghe Institute of Medical Sciences Sawangi (Meghe) Wardha)

5 Associate Professor, Dept. of Pathology Datta Meghe Medical College, (Datta Meghe Institute of Medical Sciences Sawangi (Meghe) Wardha)

6 Professor, Dept. of Pathology Datta Meghe Medical College, (Datta Meghe Institute of Medical Sciences Sawangi (Meghe) Wardha)

Abstract-

Introduction- In India, prostate cancer is more common than in other Asian countries. In India, it is the fifth leading cause of cancer in men and the fourth leading cause of cancer mortality. The incidence of both neoplastic and non-neoplastic prostate lesions is on the rise, especially among the elderly. As a result, we attempted to investigate the numerous histological features seen in both benign and malignant prostatic lesions reported in tertiary care centres in the current study.

Aims and objectives: The goal of this study was to look at the histopathological features of prostatic lesions that were reported in a tertiary care institution.

Material and method: The research was carried out at MIMSR Medical College, Latur, in the Department of Pathology. The study comprised all prostate specimens sent to the department of pathology for histological diagnosis. The age of the patients, their presenting symptoms, the findings of the Digital Rectal Examination (DRE), and relevant tests such as serum PSA levels, USG, and clinical diagnosis were all taken down from the case records.

Results: A total of 110 samples were analysed in this study, with 93.64 % being benign and 6.36 % being malignant. The most prevalent age group for benign lesions was 61-70 years, accounting for 43.69 %. TURP accounted for 98.18 % of the total specimens, while needle biopsy accounted for 1.82 %. Nodular Hyperplasias were detected in 65 (59.09 %) of the benign lesions, NH with PIN in 6 (5.46 %), and prostatitis in 28 (27.19 %) of the cases. The majority of malignant lesions were found in people aged 71 to 80, accounting for 57.14 % of all cases, with one instance being linked to HGPIN. In four cases, the most common pattern was a Gleason score of 7 (57.14 %).

Conclusion:. As a result, we find that nodular hyperplasia without prostatitis was the most common benign lesion in this study, followed by nodular hyperplasia with prostatitis, basal cell hyperplasia, and red infarct with squamous metaplasia. PIN with a high grade shows a strong link to prostatic carcinoma.

Introduction:

In India, prostate cancer is more common than in other Asian countrie.[.1] It is the fifth leading cause of cancer in men and the fourth leading cause of cancer mortality in India. Prostatic carcinoma affects one in every 22 Indian men at some point in their life, and the rate of occurrence is growing by 3.5 % per year. [2] Because the aetiology of prostatic cancer is mostly unclear, disease prevention is challenging. Hereditary factors play a part in this.[3,4] The wide variations in the prevalence of clinically evident carcinoma suggest that nutritional and environmental factors may potentially play a role in the disease's development and progression.[5]

Moore's word "Nodular Hyperplasia" is a more precise designation than the common name BPH. Hyperplasia of both glandular and stromal components results in a nodular expansion of the gland.[6] The epithelium and fibromuscular stroma in the transition zone and periurethral region overgrow in NH.[6] Nodular hyperplasia is a very prevalent condition among the elderly. Beginning in the fourth decade of life, the prevalence of NH rises rapidly, reaching approximately 100% frequency by the ninth decade. In populations all around the world, the age-specific frequency is strikingly comparable. [7]

The incidence of both neoplastic and non-neoplastic prostate lesions is on the rise, especially among the elderly. Prostatitis, NH, and tumours are the three most common lesions that should be thoroughly investigated. Prostatitis must be diagnosed as soon as possible since it can be properly treated with medication. The term "NH" refers to a hyperplastic process involving the stromal and epithelial parts of the prostate. Because it is a very common disease in older men over the age of 50.[8] we attempted to investigate the various histological features identified in both benign and malignant prostatic lesions reported in tertiary care centres in this study.

Aims and objectives:

The goal of this study was to look at the histopathological aspects of prostatic lesions that were reported in a tertiary care centre.

Material and method:

The research was carried out at MIMSR Medical College, Latur, in the department of Pathology. The study comprised all prostate specimens sent to the department of pathology for histological diagnosis.

This study used the following inclusion and exclusion criteria.

- **Inclusion criteria:**
    All types of prostatic specimens including TURP, Needle biopsy and prostatectomy are considered in this study.
- **Exclusion criteria:**
    Inadequate biopsies and poorly preserved prostatic specimens are excluded.

115 specimens were received over the course of the investigation. 5 specimens were excluded based on the above-mentioned exclusion criteria due to insufficient biopsies and poor preservation. As a result, the current investigation comprised a total of 110 prostatic specimens.

Age of patients, presenting symptoms, Digital Rectal Examination (DRE) findings, and pertinent tests such as serum PSA levels, USG, and clinical diagnosis were all taken down from the case records.

A thorough and extensive physical examination was performed on all of the prostatic specimens. Around 4 thick sections were generated and stained routinely with H&E and classified into various benign and malignant lesions using 10% formalin fixed and paraffin embedded tissue sections from these specimens for microscopic investigation. The histological sections were stained according to normal techniques. The results of H&E stains were analysed and classified into benign and malignant lesions. Just below a light microscope, many forms of cancer were examined. The VACURG, Gleason grading system, and Gleason's histologic scores were used to determine the histologic grade for each form of adenocarcinoma. Associated Tissue alterations in the prostate, such as tumour invasion, PIN, and other prostatic abnormalities, were also investigated. All of the specimens were thoroughly examined, with specific attention paid to the features listed on the proforma, and the histological sections were stained according to standard techniques.

Results:

Table no.1. AGE INCIDENCE OF VARIOUS PROSTATIC LESIONS

AGE (Years)	BENIGN LESIONS	MALIGNANT LESIONS	TOTAL
41-50	03 (2.91%)	01 (14.29%)	04 (03.64%)
51-60	21 (20.38%)	00 (00.00%)	21 (19.09%)
61-70	45(43.69%)	02 (28.57%)	47 (42.73%)
71-80	28 (27.19%)	04 (57.14%)	32 (29.09%)
81-90	06(05.83%)	00 (00.00%)	06 (05.45%)
TOTAL	103 (100%)	07 (100%)	110 (100%)

A total of 110 samples were analysed in this investigation, with 103 being benign and 7 being malignant. In this study, benign lesions were found in 93.64 % of cases and malignant lesions in 6.36 % of cases. The bulk of the 103 benign lesions were found in people between the ages of 61 and 70. The youngest case was 45 years old, and the oldest case was 90 years old. The average age of benign lesions is 65.78 years, with a standard deviation of 8.93 years(65.78±8.93) . The majority of the 7 malignant lesions were seen in people aged 71 to 80 years old. In this group, the youngest person was 50 years old and the oldest person was 80 years old. The average age of malignant lesions is 65 years old, with a standard deviation of 10.66 years (65 ± 10.66).

Table no.2.   NATURE OF PROSTATIC SPECIMEN STUDIED

Gross	Benign Lesion	Malignant Lesion	Total
TURP	102	06	108
Needle Biopsy	01	01	02
TOTAL	103 (93.64%)	07 (06.36%)	110 (100%)

TURP was performed in 102 cases and needle biopsy was performed in one case among the benign lesions. Six TURP and one needle biopsy specimens were found to have malignant lesions. TURP accounted for 98.18 % of the total specimens, while needle biopsy accounted for 1.82 %.

**Table no.3.   Microscopic finding in benign and malignant lesions**

MIROSCOPIC FINDINGS		NO.OF CASES
Benign lesion	Adenofibromyomatous hyperplasia(NH)	103
	Basal cell hyperplasia	02
	Red infarct with squamous metaplasia	02
	Chronic prostatitis	23
	Abscess (ACUTE)	05
Malignant lesion	Discrete glands	06
	Fused glands	05
	Cribriform pattern	04
	Cords	04
	Sheets	03
	Nests	04
	Clear cells	02
	Perineural invasion	02

Microscopic finding in benign lesion
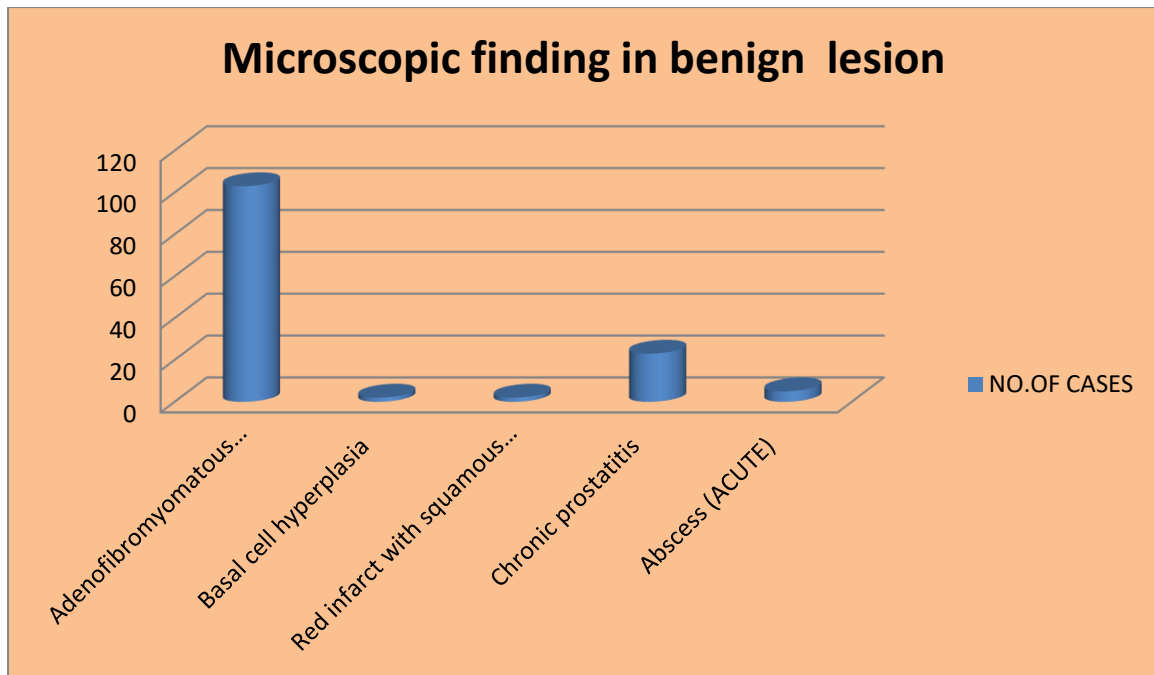
NH was found in 103 prostatic tissues in this investigation. Different proportions of epithelium and stroma were present in the lesions. In the vast majority of instances, Corpora amylacea was discovered. In 23 cases, lymphocytes and plasma cells were mixed together in a persistent inflammatory cell infiltrate. In five cases, neutrophils gathered in and around the acini.

In two cases, NH was found to be linked to BCH, which was characterised by basal cell proliferation. A red infarct with squamous metaplasia was seen in two cases of NH. Ischemic haemorrhagic necrosis was present in the lesions, which were followed by reactive alterations in the remnant epithelium.

In this study, a total of 7 cases of prostatic cancer were discovered. All of them were prostate cancer adenocarcinomas. In six cases, the most common pattern was a discrete glandular/ acinar pattern, followed by an arrangement of merged glands in five cases, tumour cells in cords and sheets in four cases, and sheets in three cases. In four cases, a cribriform or nested pattern was observed. In two cases, perineural invasion was observed. Nuclear enlargement, hyperchromasia, and conspicuous nucleoli were found in tumour cells organised in glands, sheets, and cords. Smooth muscle bundles separated these cells, indicating an infiltrative process.

Microscopic finding in malignant lesions
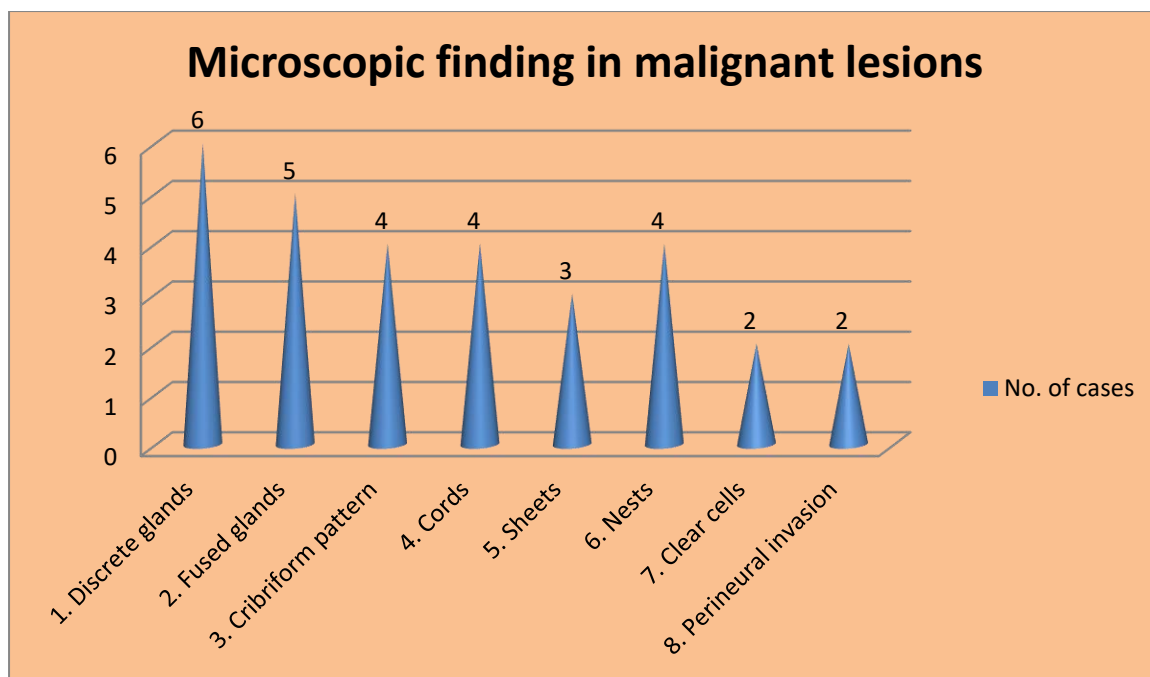
Table no.4.   INCIDENCE OF CARCINOMA WITH REFERENCE TO GLEASONS SCORE

Gleasons score	No.of cases	%
6	03	42.86%
7	04	57.14%
8	00	00%
9	00	00%
10	00	00%
Total	07	100%

Gleason's scoring system was used to score all seven cancer cases. The dominating pattern is assigned to primary grade, while the subdominant pattern is assigned to secondary grade. The combined Gleason's score is calculated by adding the two numeric grades. The number is doubled in tumours with only one pattern of organisation. In four cases, the most common pattern was a

Gleason score of 7 (57.14 %). Three patients (42.86 %) each had a Gleason score of 6. The investigation did not reveal the early and late trends of Gleason's score.

Table no.5.   FINAL HISTOPATHOLOGICAL DIAGNOSIS

FINAL HISTOPATHOLOGICAL DIAGNOSIS		NO.OF CASES (N=110)
Nodular Hyperplasia	Without prostatitis	65
	With prostatitis	28
	Basal cell hyperplasia	02
	Red infarct with squamous metaplasia	02
	PIN with LGPIN	05
	PIN with HGPIN	01
Adenocarcinoma		07

Among the 110 cases studied, 65 instances were NH without prostatitis and 28 cases were NH with prostatitis, accounting for 84.55 % of the total cases analysed. Malignant instances accounted for 6.36 % of all cases, with one case being linked to HGPIN.

Discussion:

The purpose of this study was to investigate the histological analysis of prostatic lesions reported in tertiary care centres. It was carried out in the pathology department of MIMSR medical college, Latur. The current study looked at 110 prostate specimens in total. Following the histological examination, it was discovered that 103 of the 110 specimens were benign and seven were malignant. As a consequence, 93.64 % of patients were benign lesions, which was similar to Mittal et al[9] (92.98 %), Elizabeth et al[10] (89.1 %), and Kshitij Arora et al[11](91.33 %). The incidence of carcinoma was 6.36 %, which was similar to the results of the previous investigations.

The most prevalent age group for benign lesions in the current study was 61-70 years, accounting for 43.69 %, which was comparable to the incidence of 40.4 % in As Anjorin et al[12] study. The most prevalent age groups for malignant lesions in the current study were 61-70 and 71-80 years, with 28.57 % and 57.14 %, respectively, which was comparable to Mittal et al9 and As Anjorin et al[12].

On microscopic examination, Nodular Hyperplasias were detected in 65 cases (59.09%) and NH with PIN in 6 (5.46%) of the benign lesions. Hyperplasia of both epithelial and stromal (fibromuscular) components was detected in 32 (29.09 %) cases where NH was coupled with other lesions. It covers cases when NH coexisted with other lesions such as PIN, atypical hyperplasia, metaplasias, and basal cell hyperplasia. In 59.09 % of instances, NH was detected alone, which was similar to Mittal et al[9] findings (55.67 %). Two individuals with NH and basal cell hyperplasia were found in the current investigation, both in the 61-70 year old age group, with the typical symptoms of frequency, retention, and nocturia. All of the patients in a research by Cleary et al were over 60 years old and had both NH and basal cell hyperplasia.[13] In addition to NH, two cases of squamous metaplasia with red infarct were found in this investigation, accounting for 1.82 % of the total cases investigated. However, a research by Mittal et al[9] found that 10.27 % of patients had metaplastic epithelium.

In the current study, 28 (27.19 %) of the 110 cases developed prostatitis, with 5 cases demonstrating prostatic abscess with sheets of neutrophils in and around acini. Granados et al.[14] found sheets of neutrophils in and around the acini in 25 instances with prostatic abscess. A total of 23 cases of chronic non-specific prostatitis were found in this investigation (22.33 %). Lymphocytes, plasma cells, and macrophages were found in instances of chronic non-specific prostatitis.In their investigation, Bostwick et al[7] found that chronic abacterial prostatitis was more common than bacterial prostatitis. Soler et al[15] discovered 68 cases of prostatitis linked with NH (38.9%). Inflammatory alterations were found in 14 instances (46.6 %) in a research by Barakzai MA et al[16]. Prostatitis was found in 28 (27.19%) of the cases in our investigation, which is similar to the findings of Soler et al. [15]

Seven cases of prostate intraepithelial neoplasia were found in this investigation. Five cases of LGPIN were found to be linked to NH. HGPIN was found in two cases, one of which was linked to NH and the other to prostatic cancer. PIN was found in the 60-70 year old age range in our study. McNeal's study on premalignant lesions of the prostate found a similar peak age group.[17] PIN without carcinoma was seen in 6 cases (5.82%) in this study, which was comparable to Horninger W.et al[18] (4.7%) and Kshitij Arora et al[11] (4.48 %). Because most of the specimens in our investigation were TURPs, which do not have enough material compared to radical prostatectomy specimens analysed in other studies, the incidence of HGPIN in cases of prostatic cancer was relatively low. [19] It's also possible that the transition zone has nothing to do with HGPIN.[20] Furthermore, solitary HGPIN is uncommon in TURP specimens(prevalence 2.3 %).[21] It is more widespread in the peripheral zone than in the transition zone.[22] Because histological identification of LGPIN is vulnerable to subjective variation and many studies do not record LGPIN, the incidence of PIN varies significantly between studies.[22]

The incidence of prostate cancer was 6.36 % in this study. This is rather low in comparison to most recorded series, and the incidence rate of prostate cancer varies greatly around the globe.[9] Gleason's scoring system was used to score all seven cancer cases. The majority of our instances had moderate to good distinction. In this investigation, the most common pattern was Gleason score 7, which was detected in 57.14 % of patients. The Gleason score 6 pattern was identified in 42.86 % of patients. Gleason score 6 was the most common pattern in a study conducted by Babaian Richard et al (2001),[23] and Gleason score 7 was the next most common pattern.

In the current study, four cases (57.14 %) had a high level of differentiation, while three cases (42.86 %) had a moderate level of differentiation. Micheal A Bean et al[23] investigated 103 cases in 1973, finding that well differentiation type was found in 20.38 % of cases and moderate differentiation type was found in 49.51 %. The percentage of moderately differentiated individuals in the current study was 42.86 %, which was close to the previous study, while the percentage of well differentiated individuals was higher in the current study.

Conclusion:

As a result, we may conclude that benign lesions accounted for 93.64 % of the cases in our study, while malignant lesions accounted for 6.36 %. Nodular hyperplasia without prostatitis was the most common benign lesion, followed by nodular hyperplasia with prostatitis, basal cell hyperplasia, and red infarct with squamous metaplasia. PIN with a high grade shows a strong link to prostatic carcinoma. The most prevalent type of prostatic cancer is conventional adenocarcinoma, which often has poorly differentiated patterns.

References:

1. Krishna V. Textbook of Pathology. Orient Longman 2004; 889-905.
2. Cover story. Health Screen, 2004 Aug; 10-16.
3. Carter SB, Bova GS, Beaty HT, Steinberg DG, Childs B, Isaacs BW et al. Hereditary Prostate Cancer: Epidemiologic and clinical features. J Urol. 1993; 150:797-802.
4. Woolf MC. An Investigation of the familial aspects of carcinoma of the prostate. Cancer. 1960; 13: 739-744.
5. Carter BH, Pianta Dosi S, Isaacs TJ. Clinical evidence for and implications of The Multistep Development of Prostate Cancer. J Urol. 1990; 143: 742-746.
6. Rosai J. Male reproductive system. In: Rosai & Ackerman's. Surgical Pathology. 9th ed. Vol.1, Missouri: Mosby; 2004:1361-1412.
7. Bostwick DG, Amin MB. Male reproductive system. In: Damjanov I, Linder J, editors. Anderson's pathology. Vol.1, 10th Ed., Missouri: Mosby; 1996.p.2197-2222.
8. Epstein IJ. The lower urinary tract and male genital system. In : Kumar V, Abbas A, Fausto N, Aster J, editors. Robbins and Cotran Pathologic basis of disease. 8th ed, Saunders: 2010; 971-1004.
9. Mittal BV, Amin MB, Kinare SG. Spectrum of histological lesions in 185 consecutive prostatic specimens. J Postgrad Med. 1989; 35:157-161.
10. Elizabeth George and Sosamma Thomas. Histopathologic survey of prostate disease in the Sultanate of Oman. The Internet Journal of Pathology. 2005; 3(2) :dated 18/8/07 www.ispub.com
11. Kshitij Arora, Jyoti Sapre, A. S. Agnihotri, J. R. Joshi, N. J. Trivedi. Utility of Prostate Specific Antigen (PSA) in different Prostatic Lesions, PSA assay. Pathology and laboratory medicine. 2011 ; 3 (1) : 18-23.
12. Anjorin AS, Adeniji KA, Ogunsulire IA. Histopathological study of prostatic lesions in ILORIN, Nigeria .Central African journal of medicine. 1998 ; 44(3):72-75.
13. Cleary RK, Choi YH, Ayala GA. Basal cell hyperplasia of the prostate. Am J Clin Pathol. 1983; 80(6):850-854.
14. Granados AE, Riley G, Salvador J, Vicente J. Prostatic abscess: Diagnosis and treatment. J Urol. 1992; 140:80-82.
15. Soler Soler JL, Martínez Torres JL, Hidalgo Domínguez Mdel R, Lardelli Claret P, Liébana Ureña J,

Zuluaga Gómez A, Saharour G. Inflammatory changes in the obstructed prostate: the correlation between the bacteriological and histological findings. Arch Esp Urol. 1999 ; 52(7):729-38.

16. Barakzai MA, Mubarak M, Kazi JI. Histopathological lesions in Transrectal ultrasound guided biopsies of prostate in patients with raised serum prostate specific antigen: A preliminary report. Nephro-Urol Mon*. 2011; 3(3):186-190.

17. McNeal EJ, Bostwick GD. Intraductal dysplasia – A premalignant lesion of the prostate. Hum Pathol. 1986; 17(1):64-71.

18. Horninger W, Volgger H, Rogatsch H, Strohmeyer D, Steiner H, Hobisch A et al. Predictive value of total and percent free PSA in High grade prostate intraepithelial neoplasia lesion: Results of tyrol prostate specific antigen screening project. J Urol. 2001; 165:1143-1145.

19. McNeal EJ. Morphogenesis of prostatic carcinoma. Cancer. 1965;18: 1659-1666.

20. Brawer KM. Prostatic intraepithelial neoplasia: A premalignant lesion. Hum Pathol. 1992; 23:242-248.

21. Gaudin PB, Wojno KJ, Sesterhenn IA, et al. High grade PIN in TURP specimen. Modern Pathology. 1995; 8(76A).

22. Epstein IJ, Yang JX. Prostatic intraepithelial neoplasia and its mimickers. In: Prostate biopsy interpretation, 3rd edn., Philadelphia : Lippincott W & W, 2002.p.11-18.

23. Babaian JR, Johnston AD, Naccarato W, Ayala A, Bhadkamkar AV, Fritsche AH. The incidence of prostate cancer in a screening population with a serum prostate specific antigen between 2.5 and 4.0 ng/ml. Relation to Biopsy Strategy. J Urol. 2001; 165:757-760.