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PATTERN OF PROSTATIC LESIONS A HISTOPATHOLOGICAL STUDY WITH CLINICAL CORRELATION IN A SAMPLE IN IRAQI MALE PATIENTS

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ABSTRACT

Background: prostatic lesions are a common problem in elderly male that cause significant morbidity and mortality in this age group, histopathological evaluation is a crucial method to reach final diagnosis and treatment. Gleason's grading system is an essential prognostic parameter in adenocarcinoma. **Objective:** To study the frequency of histopathological types of different lesions of prostate in relation to age and clinical variables, and to analyze adenocarcinoma according to Gleason grading system. **Method:** This is a retrospective study of 145 randomly selected cases of prostate gland pathology reported from January 2018 to December 2021 at department of pathology, Baghdad Medical City, Al-Emamain Al-Kadhmain Medical city. **Result:** Most of the lesions were benign (82%), followed by malignant (23%) and prostatic intraepithelial lesions (PIN) formed (2%), the majority of prostatic lesions was in age group (61-70) years. TURP was the most common procedure of prostatic biopsy (54%). The most common was benign prostatic hyperplasia which formed (59.3%) followed by benign prostatic hyperplasia & chronic prostatitis (17.9%) of cases. In adenocarcinoma the highest percentage was of Gleason's score 7 formed (47.8%), followed by score 6 formed (21.7%). Perineural invasion was identified in 65.2% of malignant cases. **Conclusion:** nodular hyperplasia was the predominant. Prostatic pathology are common in the age group of 61-70 years. TURP specimens were the most common biopsy procedure.in adenocarcinoma cases the most common Gleason's score was 7 and the most common Gleason's grade group was 3. Perineural invasion was identified with high percentage of adenocarcinoma cases.

KEYWORDS: Prostate, Prostatic lesions, Gleason's system, benign prostatic hyperplysia.

INTRODUCTION

The largest accessory gland in males is the prostate, its located at the neck of the bladder[1], it's a pear-shaped, weighs up to 20 g in a normal adult male and its subsequent growth and differentiation depend on androgenic hormones synthesized in testis.[2] It is most commonly divided into four zones: anterior zone, central zone; peripheral zone; and preprostatic region, which encompasses the periurethral ducts and the larger transition zone. the transition zone, is mostly affected by benign hyperplasia, while the peripheral zone affected more frequently by carcinoma.[3] Glands lined mainly with two major types of cells: secretory cells and basal cells, and several cell types intermediate between basal and secretory cells.[4]

The prostatic diseases incidence increase with age.[5] The commonest disease affecting the prostate is BPH.[1] Prostatitis is an inflammatory process of prostate it is divided into acute, chronic and granulomatous; it is frequently associated with BPH.[6] Regarding premalignant lesions, the biology is important to be understood as it lately has been attributed to multistep carcinogenesis, two premalignant lesions were recognized: **prostatic intraepithelial neoplasia (PIN)** and **atypical adenomatous hyperplasia (AAH),** PIN represented as a cytological change in architecturally normal glands.[7] It's classified Based on the degree of atypia as low grade **(LGPIN)** and high grade **(HGPIN)**[4], the glands in HGPIN is more basophilic than adjacent glands because of the increased nuclear to cytoplasmic ratio, crowding of nuclie and amphophilic cytoplasm. The presence of prominent nucleoli and large nuclei is the defining feature.[2] AAH defined as architectural alteration in cytologically unremarkable glands.[7] Worldwide, prostate cancer is the second most common clinically identified malignancy and the fifth most common cause of death as a result of malignancy in men.[1] In Iraq prostate cancer was the fourth commonest ten cancers in year 2016 which 791 cases were recorded constituted 7.07% of total male cancers[8] The clinico-pathological features of newly diagnosed cancer have considerably changed because of widespread prostate specific antigen screening after it has been introduced in the late 1980s[9] Cancer detection in prostate biopsy is challenging, particularly if the focus is minute. It is important to recognize limited cancer to avoid underdiagnosis, and to recognize benign mimics of prostate cancer to avoid overdiagnosis. Diagnosis of cancer in needle biopsy requires constellation of cytological and architectural features of cancer glands and sometimes ancillary immunohistochemistry is necessary[4] Prostate malignancy may be asymptomatic

initially and often has an indolent course, and may need minimal or even no treatment. However, the frequent complaint is urination difficulty, frequency, and nocturia; these symptoms may also arise from hypertrophy of prostate. More advanced stage may present with urinary retention and back pain due to vertebral metastasis.[10] Gleason system is an important indicator of prognosis in prostate cancer and plays a vital role in the treatment.[11] Gleason grading system is an objective assessment of degree of differentiation of prostatic malignancy. The parameters (clinical stage, sPSA, and Gleason system) are needed in deciding the modalities of the treatment.[12] The Gleason system describes five histological patterns in adenocarcinoma seen on (H&E sections), architectural patterns rather than cellular features. Gleason 1 is the best differentiated and is associated with the most favorable prognosis, whereas Gleason 5 represents the least differentiated and is associated with poor prognosis. As many prostate adenocarcinomas harbored two or more patterns, the GS was developed, and it was found to have an association with the biological behavior of adenocarcinoma.[13] According to the second 2014 modification of the Gleason grade:GS less than or equal to 6 were classified in grade group I, GS 3+4=7 in grade group II, GS 4+3=7 in grade group III, GS 4+4=8 in grade group IV, and GS 9-10 in grade group V.[14]

AIMS AND OBJECTIVES

1-To study the frequency of histopathological types of different lesions of prostate in relation to age and clinical variables. 2- To analyze adenocarcinoma of prostate according to Gleason system.

MATERIALS AND METHODS

This is a retrospective study of 145 randomly selected cases of prostate gland pathology reported from January 2018 to December 2021 in department of pathology, Baghdad Medical City, Al-Emamain Al-Kadhmain Medical city. Patients presented with lower urinary tract symptoms, admitted to the Urosurgical ward and underwent surgical procedure for prostate (prostatectomy, true cut needle biopsy, TURP) The data collection included: age of the patients, post-operative histopathological diagnosis; Gleason score (in prostate adenocarcinoma is the sum of the two most prevalent Gleason grades, a measure of tumor aggression), and Gleason grade group. Inclusion criteria: Male patients belonging to all age groups. Exclusion criteria: Normal histopathological report of prostate specimen, Incomplete data. Formalin-fixed and paraffin-embedded tissue blocks were collected. Sections 4-6 microns stained with H&E and the diagnosis was revised by the supervisor.

Statistical analysis

This is a retrospective descriptive study about prostatic lesion histopathology; most of data are expressed as frequency and percentage. Statistical package for social sciences (SPSS) (version 23) were used for calculations.

RESULTS

This study included 145 male with prostatic lesions. The age ranged from 48-83 years with a mean age of these patients was 66.87 years (Table 1).

Table 1: Age of cases.

Parameter	Mean±SD	Median	Range
Age (yr)	66.87±8.93	70.0	48-83

Figure (1) represents the number of cases according to their histopathology. Most of the lesions were benign (82%), followed by malignant (23%) and then HGPIN (2%).

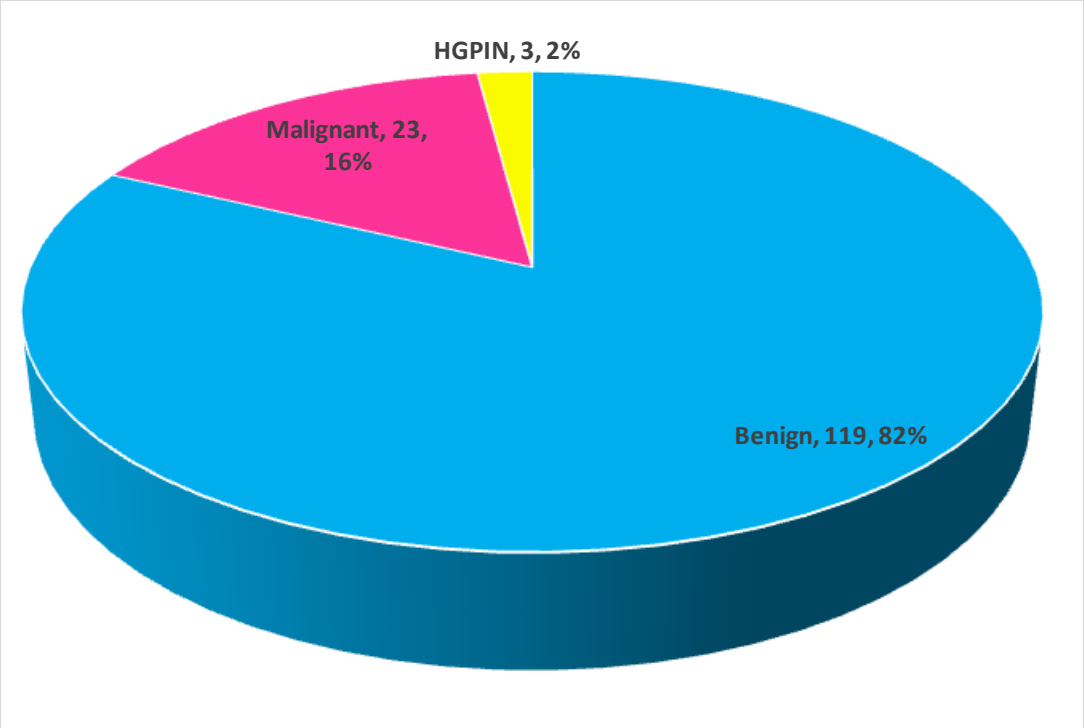

Figure 1: Pie chart for prostatic lesions histopathology.

The majority of benign cases (52.1), malignant cases (47.8) and PIN (66.7) were in age group (61-70).

Table 2: Distribution of histopathology according to age group.

Age group (yr)	Benign		Malignant		HGPIN	
	N	%	N	%	N	%
≤50	3	2.5	1	4.3	0	0.0
51-60	28	23.5	5	21.7	1	33.3
61-70	62	52.1	11	47.8	2	66.7
71-80	23	19.3	5	21.7	0	0.0
>80	3	2.5	1	4.3	0	0.0
Total	119	100	23	100	3	100

Fig. (2) Represents the percentage of prostatic lesions procedures TURP was the most common (54%) followed by core needle biopsy (41%) and the least common procedure was prostatectomy (5%).

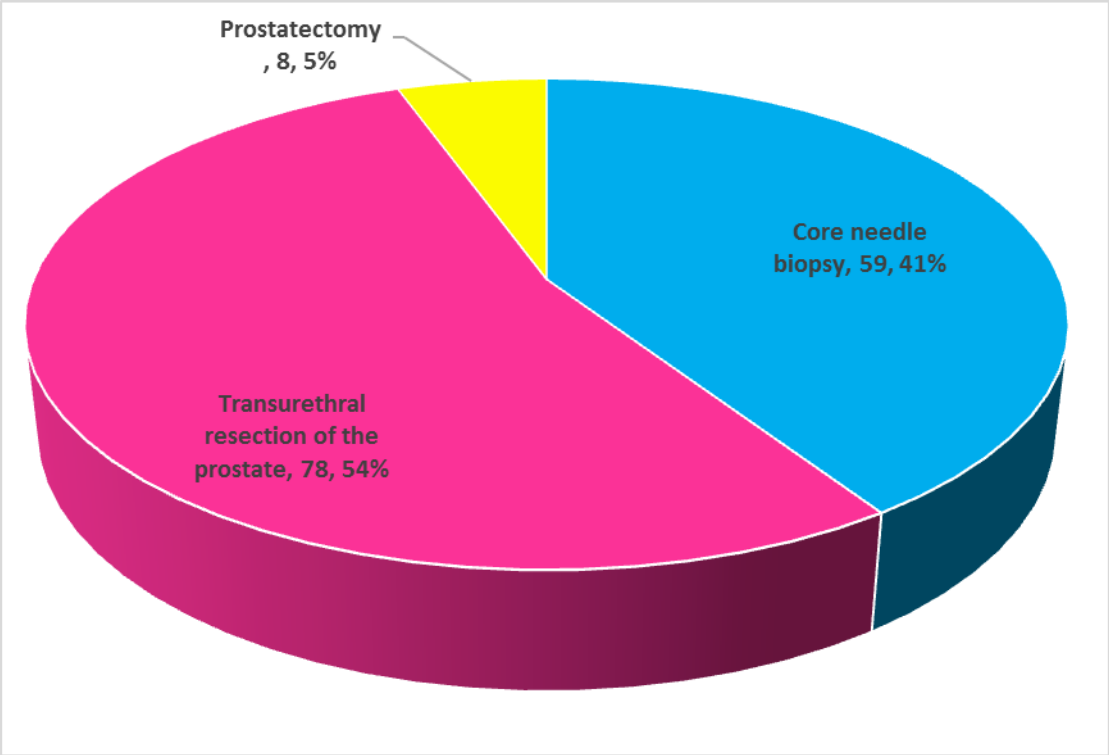

Figure 2: Pie chart for prostatic lesions procedures.

The most common histopathology was Benign prostatic hyperplasia (BPH) which formed (59.3%) followed by Benign prostatic hyperplasia & chronic prostatitis (17.9%) of cases, Benign prostatic hyperplasia & squamous metaplasia formed (0.7%), chronic prostatitis formed (4.1%), HGPIN formed (2.1%) and adenocarcinoma formed (15.9%), Table (3).

Table 3: Frequency and percentage of histopathology of prostatic lesions.

Histopathology	Frequency	Percentage
Benign prostatic hyperplasia	86	59.3
Benign prostatic hyperplasia & chronic prostatitis	26	17.9
Benign prostatic hyperplasia & squamous metaplasia	1	0.7
Chronic prostatitis	6	4.1
HGPIN	3	2.1
Adenocarcinoma	23	15.9
Total	145	100

In adenocarcinoma the highest percentage was of Gleason's score 7 formed (47.8%), followed by score 6 formed (21.7%), followed by score 9 formed (71.4), and the least was score 8 formed (13%), Table (4).

Table 4: Frequency and percentage of Gleason's score in malignant prostatic lesions.

Gleason's score	Frequency	Percentage
6 (3+3)	5	21.7
7 (3+4)	2	47.8
7 (4+3)	9	
8 (4+4)	3	13.0
9 (4+5)	4	17.4
Total	23	100

Gleason's grade group the commonest was grade 3 (43.5), followed by grade 1 & 5 (21.7%), followed by 4 (8.7), and the least common was grade 2 (4,3), Table (6).

Table 6: Frequency and percentage of Gleason's grade in malignant prostatic lesions.

Gleason's grade	Frequency	Percentage
1	5	21.7
2	1	4.3
3	10	43.5
4	2	8.7
5	5	21.7
Total	23	100

Gleason's grade 1 was 60 % in age group 51-60 and 40% in age group 61-70 Gleason's grade 2 was 100% in age group 61-70, Gleason's grade 3 was 50% in 61-70, 30% in 71-80, 10% in ≤50 and in >80, Gleason's grade 4 was 50% in 61-70 and 50% in 71-80, Gleason's grade 5 was 40% in age group 51-60&61-70 and 20% in age group >80, table (7).

Table (7): Gleason's grade in malignant prostatic lesions according to age groups

Age group (yr)	Gleason's grade				
	1	2	3	4	5
≤50	0 (0.0)	0 (0.0)	1 (10.0)	0 (0.0)	0 (0.0)
51-60	3 (60.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (40.0)
61-70	2 (40.0)	1 (100)	5 (50.0)	1 (50.0)	2 (40.0)
71-80	0 (0.0)	0 (0.0)	3 (30.0)	1 (50.0)	1 (20.0)
>80	0 (0.0)	0 (0.0)	1 (10.0)	0 (0.0)	0 (0.0)

Data expressed as frequency and percentage

Perineural invasion was identified in 65.2% of malignant cases, table (8).

Table (8): Frequency and percentage of perineural invasion in malignant prostatic lesions.

Perineural invasion	Frequency	Percentage
Identified	15	65.2
Not identified	8	34.8
Total	23	100

Perineural invasion was not identified in all cases with Gleason's score 6, identified in 72,2 % in score 7, identified in 100% of score 8 and identified in 100% of score 9, table (9).

Table (9): Gleason's score in malignant prostatic lesions according to perineural invasion

Perineural invasion	Gleason's score			
	6	7	8	9
Identified	0 (0.0)	8 (72.7)	3 (100)	4 (100)
Not identified	5 (100)	3 (27.3)	0 (0.0)	0 (0.0)

Data expressed as frequency and percentage

Perineural invasion was identified in all cases of gleason grade 2, 5, 30% in grade 3, and not identified in grade 1, table (10).

Table 10: Gleason's grade in malignant prostatic lesions according to perineural invasion.

Perineural invasion	Gleason's grade				
	1	2	3	4	5
Identified	0 (0.0)	1 (100)	7 (70.0)	2 (100)	5 (100)
Not identified	5 (100)	0 (0.0)	3 (30.0)	0 (0.0)	0 (0.0)

Data expressed as frequency and percentage

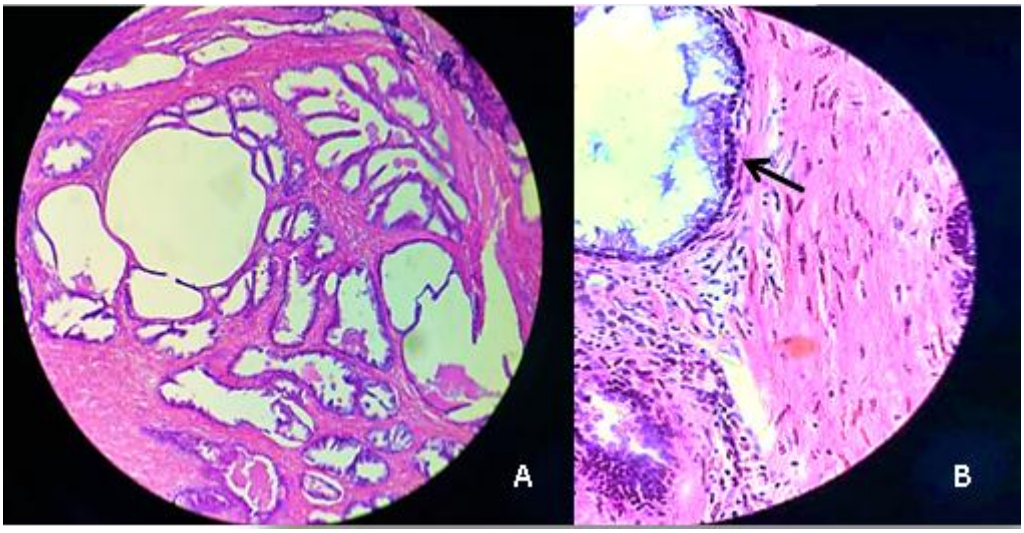

Fig (3): Benign prostatic hyperplasia. A shows glandular hyperplasia (H&E stain, x10), B shows gland lined by double layered epithelium (arrow) (H&E stain, x40).

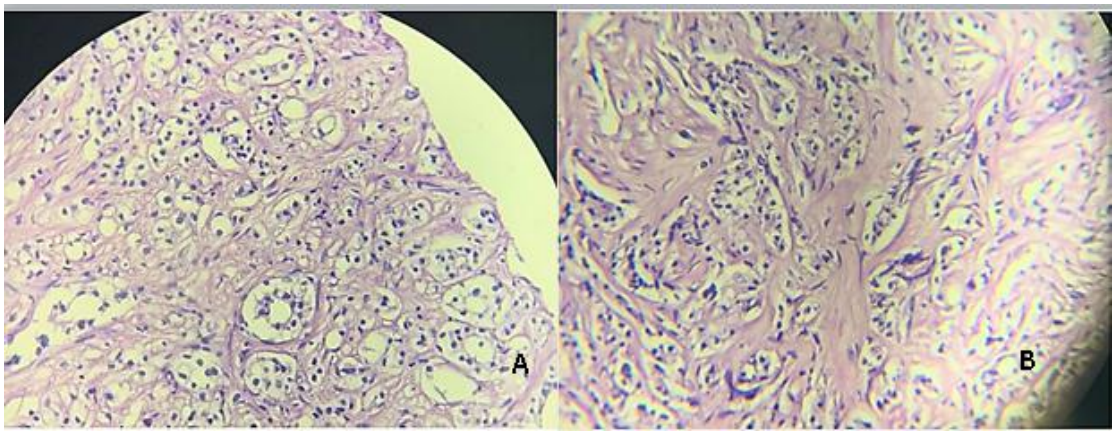

Fig. (4): Adenocarcinoma, Gleason's score 7 (4+3) .A shows small uniform glands lined by single layered epithelium (H&E stain, x20), B shows poorly formed glands with acinar structures fusing into cords (H&E stain, x20).

DISCUSSION

Prostatic diseases, mainly BPH and adenocarcinoma are a common prostatic lesions and accounts to significant morbidity and mortality in geriatric age. Serum Prostate specific antigen along with Digital rectal examination, transurethral ultrasonography, and transurethral resection/ trucut biopsies of prostate are crucial for the investigation and final diagnosis of prostate pathology.[15] In this study the frequency of benign lesions was the most common accounts for 82%, followed by adenocarcinoma accounts for 16% and PIN accounts for 2%, comparable results were recorded by Dr. Reeti Rajani *et al.*[16] (2020). The majority of benign lesions 52.1% were in age group 61-70 years, and the maximum cases of malignant

lesions 47.8% were in age group 61-70 years similar to Dr.Reeti Rajani *et a.l*[16] (2020). The most common procedure was TURP similar results were recorded by Bhatta S *et al.*[17] 2018. The most common lesion was Benign prostatic hyperplasia 59.3, followed by Benign prostatic hyperplasia & chronic prostatitis17.9 and then adenocarcinoma formed (15.9%), comparable results were recorded by Dr.Reeti Rajani *et al.*[16] (2020) and Bhatta S *et al.*[17] 2018. The most common procedure in this study was TURP similar to the study done by Bhatta S *et al.*[17] 2018. Gleason's score the most common was score 7 represented 47%, similar results recorded by Dr. Reeti Rajani *et al.*[16] which was 47.8, and by Sanjaykumar C *et al.*[19] 2017. Which was 52.5%.

The commonest gleasons grade was grade 3 34% similar results were recorded by Dr. Reeti Rajani *et a.l.*[16] In this study perineural invasion is correlated with higher Gleason's score. Perineural invasion was seen in 65.2% of prosatate cancer this result were different from the study by Bhatta S *et al.*[17] 2018.(37.7%) this difference in the results could be due to different sample size and biopsy procedures.

CONCLUSION

Histopathological examination is crucial for diagnosis and management of prostatic lesions.benign lesions was the commonest and nodular hyperplasia was the predominant. Prostatic lesions are common in the age group of 61-70 years. TURP specimens were the most common biopsy procedure.in adeocarinoma cases the most common gleasons score was 7 and the most common gleasons grade group was 3. Perineural invasion commonly seen with high Gleason score. Perineural invasion was identified in most adenocarcinoma cases.

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