Original article

Clinicopathological Study Of Prostate Lesions

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ABSTRACT

Introduction-Prostate cancer is the second most common to lung cancer worldwide. Prostatitis, benign prostatic hyperplasia and carcinoma cover almost the entire spectrum of prostatic diseases. Objective-To study various histopathological spectrum and relation of age, incidence, symptoms with prostate lesions and investigations.

Material and method -150 cases of prostate enlargement were studied from January 2015 to June 2016. Histopathological evaluation and PSA levels were done for all cases.

Result- out of 150 cases 131, 16 and 3 cases were BPH, adenocarcinoma and PIN respectively. The most common symptom was poor stream of urine (90% cases). 78.6% cases of BPH had serum PSA level within 0 – 4 ng/ml. Adenocarcinoma had serum PSA levels >16.1ng/dl and most common Gleason's score found was 7 and 9 (37.5% cases)

Conclusion- In cases of prostate enlargement BPH was most common lesion found. In practice Gleason grading system is a simple, easily understood, remembered and easily applied and Maximum number of patients of carcinoma had serum PSA level > 10 ng/ml which suggested that the risk of prostate cancer is directly related to the serum PSA level.

Key words: Prostate, histopathology, PSA

INTRODUCTION

Prostate gland is an exocrine gland and the largest accessory reproductive organ in male. Prostate cancer is the most common cancer and the second most common cause of cancer related death in men.[1] Prostate cancer is responsible for 3% of all death in men over 55 years of age.[2] The risk factors for prostate cancer includes mainly advancing age, race, hereditary and hormonal activity. However, advanced age and intact androgen supply are the only undisputed risk factor for the development of BPH.[3]

The routine screening of the vulnerable elderly male population with the three pronged approach: digital rectal examination, transrectal ultrasound and estimation of PSA in serum has led to marked increase in the frequency of prostatic biopsies and its clinical correlation.

The premalignant proliferative changes in the glandular epithelium is relatively new development in the arena of prostatic histopathological study. Intraepithelial neoplasias of the prostate (which has a premalignant potential in some patients) and adenomatous hyperplasia of atypical variety are two major categories that have come up.

Gross identification of prostate cancer may be difficult or impossible and definite diagnosis requires microscopic examination.[4] Microscopically, it consists of proliferating small

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glands exhibiting a high variation of patterns. The cancer cells have an enlarged nuclei with a prominent nucleolus, prominent nucleolus are at least 1.25 to 1.5mm in dramatic or larger.[5] Histologic grade of prostate carcinoma has significant prognostic implication. The grading system should be not only reliable and reproducible but easily mastered.

Gleason's score is a valuable adjunct that is used commonly for histological grading of prostate cancer. It is a useful tool which can be used to separate cases of prostatic carcinoma into subdivisions of malignancy that can be compared with each other. Gleason's grading improves the analysis of treatment results that can vary between tumours of different malignancy.

Gleason grading system fulfils these criteria. It depends on histologic patterns rather than cytologic details and therefore is not time consuming. It has been observed that histological grading is substantially subjective and inter-observer and intra-observer variation occurs.[6]

AIMS AND OBJECTIVES

To study various histopathological spectrum of non-neoplastic and neoplastic prostatic lesions, and its clinical correlation and to study age, incidence and their correlation with lesions of prostate and with that of investigations.

MATERIAL AND METHODS

This study was done in the Department of Pathology, NIMS Medical College and Hospital, Jaipur from year 2015 to 2016. 150 cases of prostatic enlargement (benign and malignant) were considered in this study.

All the formalin fixed prostatic specimens received in pathology department of NIMS medical college were processed.The prostatic material included prostatic biopsies, transurethral resection of prostate (TURP) chips and prostectomy specimen. Gross examination of prostate specimen was done.The prostate specimen received in 10% formalin was processed.

In case of TURP chips 3 to 4 cassettes were prepared in each case which accommodated approximately 50% of total specimen and weigh approximately 9 to 12gms. Needle biopsy tissues were examined and processesd entirely. In case of total prostectomy specimens, multiple sections were made at a distance of 3 to 5mm and submitted entirely after dividing into adequate number of sections. The tissues were fixed and processed. 3 to 5 micron sections were cut and stained with haematoxylin and eosin (HE). All the slides were thoroughly evaluated for histological features. Its categorization was done into benign and malignant lesions and were correlated with the PSA levels.

RESULTS

150 cases of prostatic enlargement were evaluated between the period of January 2015 to July 2016. Out of 150 cases 131 cases of BPH, 16 cases of prostatic adenocarcinoma and 3 cases of prostatic intraepithelial neoplasia were identified.

Correlation between the age incidence of BPH, PIN, and prostatic carcinoma was studied. Out of 131 cases of BPH 16.1%, 51.9, 28.2%, 3.8% cases were seen in 50-59, 60-69, 70-79 and 80-89 years respectively. Corresponding figure for PIN were 66.7%, 0%, 33.3%, 0% cases are seen in 50-59, 60-69, 70-79 and 80-89 years respectively. The corresponding figure for Prostatic adenocarcinoma were 18.8%, 43.8%, 18.8%, and 18.8% in 50-59, 60-69, 70-79,and 80-89 years respectively.

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The mean age group in which BPH and adenocarcinoma was found to be 60-69 years respectively. The mean age group of PIN was found to be 50-59 years.

The different clinical complaints of the patients were studied. Maximum number of patients (135 cases, 90.0%), presented with complaint of poor stream of urine. Followed by less common symptoms like frequency and hesitancy (128 cases, 85.33%), urgency (61 cases, 40.67%), residual urine (47 cases, 31.33%) & pain on micturition (7 cases, 4.67%). Bone pain and weakness were the least common symptoms seen in 2.0% patients.

131 cases of BPH were studied for serum PSA levels and out of which 103 cases had PSA level within 0-4ng/ml and 28 had modest elevation i.e.; 4.1-10ng/ml. 16 case of prostatic carcinoma were studied and 8 cases had high levels of PSA (>24ng/ml), however 8 cases had PSA levels

between 16.1-24ng/ml. 3 cases of PIN were studied out of which 2 cases have PSA level within 0-4ng/ml and 1 case has PSA level within 4.1-8ng/ml. Prostatic carcinoma was graded according to Gleason grading system and Gleason scoring was done. Most common Gleason's score was 7 and 9 found in 37.5% patients.

Gleason's Grade 3 was the most common primary pattern seen in 50% of cases and Gleason's grade 4 as second most common Gleason's grade seen in 4 cases (25%). Gleason's Grade 4 was the most common secondary pattern seen in 8 cases (50%) and Gleason's grade 3 as second most common secondary pattern seen in 5 cases (31.25%). In this study 131 cases of nodular hyperplasia were studied out of which 73 cases (55.7%) were without prostatitis and 58 cases (54.3%) were with prostatitis. 3 cases of PIN were studied, out of which 2 cases (66.7%) were of low grade PIN and 1 case (33.3%) was of high grade PIN.

60-69	68	51.9	0	0	7	43.8	75	50
70-79	37	28.2	1	33.3	3	18.8	41	27.3
80-89	5	3.8	0	0	3	18.8	8	5.3
Total	131	100	3	100	16	100	150	100

TABLES: Table 1: Relation of age with lesion in prostate

Clinical Symptoms	Benign (n=131)		PIN (n=3)		Malignant (n=16)		Total (n=150)	
	N	%	N	%	N	%	N	%
Frequency	112	85.50	2	66.67	14	87.50	128	85.33
Hesitancy	112	85.50	1	33.33	15	93.75	128	85.33
Poor Stream of urine	118	90.08	1	33.33	16	100.00	135	90.00
Urgency	51	38.93	3	100.00	7	43.75	61	40.67
Residual Urine	37	28.24	1	33.33	9	56.25	47	31.33
Pain on Micturition	0	0.00	0	0.00	7	43.75	7	4.67
Weakness & Bone pain	0	0.00	0	0.00	3	18.75	3	2.00

Table 2: Symptoms associated with prostatic lesions

PSA (ng/ml)	Benign		PIN		Malignant		Total	
	N	%	N	%	N	%	N	%
0-4	103	78.63	2	66.67	0	0.00	105	70.00
4.1-8	28	21.37	1	33.33	0	0.00	29	19.33
8.1-12	0	0.00	0	0.00	0	0.00	0	0.00
12.1-15	0	0.00	0	0.00	0	0.00	0	0.00
16.1-20	0	0.00	0	0.00	4	25.00	4	2.67
20.1-24	0	0.00	0	0.00	4	25.00	4	2.67
> 24	0	0.00	0	0.00	8	50.00	8	5.33
Total	131	100.00	3	100.00	16	100.00	150	100.00

Table 3: Serum PSA levels in the study

Gleason's score	No. of Cases	%
2	0	0
3	0	0
4	0	0
5	1	6.25
6	2	12.5
7	6	37.5
8	1	6.25
9	6	37.5
10	0	0
Total	**16**	**100**

Table 4: Incidence of carcinoma with reference to Gleason's score

Primary architectural pattern	n	Percentage (%)
2	1	6.25%
3	8	50%
4	4	25%
5	3	18.75%
Total	**16**	**100%**

Table 5:Incidence of Primary Histological Patterns of prostate adenocarcinoma

Lesion	No. of Cases	%
Nodular Hyperplasia	131	87.3%
Adenocarcinoma	16	10.6%
PIN	3	2.1%
TOTAL	**150**	**100%**

Table 6: Incidence of Prostate lesions

Secondary architectural pattern	n	Percentage (%)
2	0	0%
3	5	31.25%
4	8	50%
5	3	18.75%
Total	**16**	**100%**

Table 7:Incidence of Secondary Histological Patterns of prostate adenocarcinoma

DISCUSSION

This study was conducted from January 2015 to June 1016 in the Department of Pathology, NIMS medical College, Jaipur. 150 cases of prostate enlargement were studied. Out of which 131 case of BPH, 16 cases of prostatic adenocarcinoma and 3 cases of prostatic intraepithelial neoplasia were identified.

In this study the mean age group of BPH was found to be 60-69 years. These finding correlated with findings of Mohammed AZ et al who observed the mean age of BPH as 63.7 years and study of Anushree C.N et al who observed that BPH is most commonly found in 60 – 69 year of age group.[7,8]

The mean age group of PIN was observed to be 50-59 years. These findings were consistent with the studies Kovi et al and Angwafo et at who observed mean age of PIN as 54.5 years and 58 years respectively.[9,10] The mean age group of prostatic Adenocarcinoma was found to be 60-69 years in this study. These finding correlate with the studies of Saker et al who observed mean- age of carcinoma of 68 years.[11] This also correlated with the finding of Mohammed AZ et al and Angwafo et al studies who found mean age of

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carcinoma cases as 67.1 years and 66.3 years respectively.[7,10]

The incidence of BPH was 87.33%, prostatic adenocarcinoma was 10.66% and of PIN was 2.01%. The findings correlated with the study of Chandanwale Shirish et al who stated the overall incidence of BPH to be 83% and of adenocarcinoma 17%.[12] This study also correlated with Pacelli et al in which the incidence of PIN was 4.2%.[13] The incidence of BPH in present study also correlated with that of Mohammed AZ et al study who found it as 77.6% while prostatic cancer accounted for 22.4% of cases.[7] The findings correlated with the study of Anushree C.N et al who observed that the lesions encountered were 90% of nodular hyperplasia, PIN were 0.7% and 9.3% were malignant cases.[8]

In benign hyperplasia of prostate symptoms were in decreasing order as poor stream of urine > frequency = hesitancy > urgency > residual urine. In malignant cases symptoms were in decreasing order as poor stream of urine > hesitancy > frequency > residual urine > urgency = pain on micturition > bone pain and weakness. In PIN symptoms were in decreasing order as urgency > frequency > hesitancy = poor stream of urine = residual urine.

These findings correlated with study of Anushree C.N et al in which frequency is the most common symptom in benign lesions followed by difficulty in voiding, acute retention and dysuria and malignant lesions had common symptoms of dysuria, incomplete voiding and frequency.[8] According to Chandanwale Shirish et al in their study 94% of patients presented with obstructive urinary tract symptoms viz. acute and chronic urinary retention, hesitancy, weak stream, terminal dribbling while 45% had urgency,

increased frequency, dysuria and nocturia and only one case had bone pain.[12]

In the present study the patients were divided into 3 groups based on serum PSA level (ng/ml). 131 cases of BPH were studied and out of which 103 cases(78.63%) had PSA level within 0-4ng/ml and 28 cases (21.37%) had modest elevation i.e.; 4.1-10ng/ml. 16 case of prostatic carcinoma were studied and 8 cases (50%) had high levels of PSA (>24ng/ml), however 8 cases had PSA levels between 16.1 – 24 ng/ml. 3 cases of PIN were studied out of which 2 cases (66.67%) have PSA level within 0 – 4 ng/ml and 1 case (33.33%) has PSA level within 4.1-8ng/ml.

The findings correlated with the findings of Anushree et al who observed that in benign lesion serum PSA was normal in 55% cases and modest elevation [4.1-10ng/ml] was seen in 26.4% cases. 57.1% malignant lesions showed marked elevation in serum PSA levels (>20ng/ml) & mean serum PSA level was 4ng/ml for PIN.[8]

In the present study, most common Gleason's score was 7 and 9 found in 37.5% patients followed by Gleason score 6 found in 12.5% patients. Our findings correlate with the study of Gleason et al who observed that most clinical detectable carcinoma of prostate gland are of Gleason's score 6 or 7 (moderately differentiated). Low grade carcinoma accounts for only 6% of the cases.[14] Bostwick et al observed 43% of cases with Gleason's score 5-6 and 44% of cases with Gleason's score >7 in case of needle biopsies.[15] According to Hugosson J et al maximum number of cases were found to be in Gleason's score range 5-7.[16] These findings correlated with the study of Chandanwale Shirish et al who observed that most common Gleason score was 7 in 52.94 % cases.[12]

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In this study, Gleason's Grade 3 was the most common primary pattern seen in 50% of cases .Gleason's Grade 4 was the most common secondary pattern seen in 8 cases (50%). These findings correlated with those reported by Bostwick et al who found Gleason primary pattern 3 as the most common primary pattern.[15] These findings also correlated with the study of Chandanwale Shirish et al who observed Gleason grade 3 to be the most common in 64.7% primary pattern in our Study.[12]

CONCLUSION

In the present study 150 cases of prostatic enlargement – operated in the Department of surgery & urology department. Out of 150 cases 131 cases of BPH, 16 cases of prostatic adenocarcinoma and 3 cases of prostatic intraepithelial neoplasia were identified. The incidence of prostate adenocarcinoma was found to be 10.66% whereas the incidence of PIN was found to be 2.01% and of BPH was 87.33%. Correlation between the age incidence of BPH, PIN, and prostatic carcinoma was studied.

It was observed that out of 131 cases of BPH 16.1%, 51.9, 28.2%, 3.8% cases were seen in 50-59, 60-69, 70-79 and 80-89 years respectively. Corresponding figure for Prostatic intraepithelial carcinoma were 66.7%, 0%, 33.3%, 0% cases in 50-59, 60-69, 70-79 and 80-89 years respectively. The corresponding figure for Prostatic adenocarcinoma were 18.8%, 43.8%, 18.8%, and 18.8% in 50-59, 60-69, 70-79, and 80-89 years respectively. The mean age group in which BPH and adenocarcinoma was found to be 60-69 years respectively.

The different clinical complaints of the patients were studied. Maximum number of patients (135 cases, 90.0%), presented with complaint of poor stream of urine. Followed by less common symptoms like frequency and hesitancy (128 cases, 85.33%), urgency (61 cases, 40.67%), residual urine (47 cases, 31.33%) & pain on micturition (7 cases, 4.67%). Bone pain and weakness were the least common symptoms seen in 2.0% patients.

It was observed that out of 131 cases of BPH, 78.6% cases had serum PSA level within 0-4ng/ml and 21.3% had modest elevation i.e.; 4.1-10ng/ml. 16 case of prostatic carcinoma were studied and 50% cases had high levels of serum PSA (>24ng/ml), however 50% cases had serum PSA levels between 16.1-24ng/ml. 3 cases of PIN were studied out of which 2 cases (66.6%) had PSA level within 0-4ng/ml and 1 case (33.3%) had PSA level within 4.1-8 ng/ml.

Prostatic carcinoma was graded according to Gleason grading system and Gleason scoring was done. The most common primary pattern was found to be Gleason grading 3 and secondary pattern was found to be Gleason grading 4. Most common Gleason's score was 7 and 9 found in 37.5% patients.

It was observed that out of 3 cases of PIN 2 cases (66.7%) were of low grade PIN and 1 case (33.3%) was of high grade PIN and out 131 cases of nodular hyperplasia 73 cases (55.7%) were without prostatitis and 58 cases (54.3%) were with prostatitis.

Conclusion:

This is to conclude that:

In practice Gleason grading system is a simple, easily understood, remembered and easily applied.

Maximum number of patients of carcinoma had serum PSA level > 10 ng/ml which suggested that the risk of prostate cancer is directly related to the serum PSA levels.

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