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Histopathological study of prostatic lesions at a tertiary care hospital, Gujarat

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Abstract

Introduction: Prostatitis, benign nodular hyperplasia, and prostatic adenocarcinoma are the common diseases affecting men commonly after their fifth decade. Prostatic tumors are a very important cause of male morbidity and mortality.

Aim and Objectives: The objective of this study was to observe the histopathological spectrum of prostatic lesions, to estimate the frequency of various prostatic lesions and to correlate them with demographic and clinical findings.

Materials and Methods: A descriptive and observational study was conducted in the department of pathology at Narendra Modi Medical College and Sheth LG General Hospital from January 2022 to January 2024. This study was conducted on 50 prostatic specimens received from surgery department.

Results: The age of the patients ranged from 43 to 91 years with peak age group of 61-70 years. Transurethral resection of prostate (TURP) was done in 21 (42%) cases, tru-cut core needle biopsy was done in 13(26%) cases and prostatectomy was done in 16 (32%) cases. Out of 50 prostatic specimens received, 44 cases were benign lesions and 6 cases showed prostatic malignancy. All 6 cases of prostatic adenocarcinoma were of acinar type. Gleason score 7 was the commonest score seen in 4 (66.66%) out of 6 cases. All cases of prostatic carcinoma had S.PSA level >10 ng/ml. In present study among all prostatic carcinoma cases, perineural invasion were reported in 3 (50%) cases.

Conclusion: Histopathological examination of prostatic lesions plays an important role in diagnosis, management and prognosis of the patients. Early diagnosis and treatment help to reduce mortality and morbidity related to prostatic lesions.

Keywords: Prostate, prostatitis, transurethral resection of prostate, nodular hyperplasia of prostate, prostate carcinoma

Introduction

The prostate is a pear-shaped glandular organ that weighs up to 20 g in the normal adult male and that depends for its differentiation and subsequent growth on androgenic hormones synthesized in the testis, acting through a poorly understood mesenchymal-epithelial interaction ^[1]. It is most commonly divided into the anterior fibromuscular stroma and three distinct glandular zones as described by McNeal: Peripheral zone, transition zone, central zone ^[2]. Nodular hyperplasia of prostate and carcinoma of prostate are two most common lesions affecting prostate gland. Most hyperplasia arise in transitional zone of prostate whereas carcinoma originate in peripheral zone ^[3].

Prostatitis, benign nodular hyperplasia, and prostatic adenocarcinoma are the common diseases affecting men commonly after their fifth decade ^[4]. Prostatic tumors are a very important cause of male morbidity and mortality and prostate cancer is second only to lung cancer among cancer-related deaths in men. Prostate cancer is responsible for 3% of all deaths in men above 55 years of age ^[5]. A relatively new development in the prostatic histopathology is the identification of premalignant conditions that can help in early diagnosis of prostate cancer ^[6]. A combination of digital rectal examination, transrectal ultrasonogram and needle biopsy can prove to be a powerful diagnostic tool in the routine diagnosis of benign and malignant prostatic lesions ^[7]. The objective of this study was to observe the histopathological spectrum of prostatic lesions, to estimate the frequency of various prostatic lesions and to correlate them with demographic and clinical findings.

Materials and Methods

A descriptive and observational study was conducted in the department of pathology at Narendra Modi Medical College & Sheth LG General Hospital from January 2022 to January 2024. The study population included were single hospital based patients who had undergone surgical procedure pertaining to prostatic lesions and whose specimens were sent to pathology department. All types of prostatic specimens including transurethral resection of prostate (TURP), tru-cut core needle biopsy and prostatectomy were studied. Patients with inadequate clinical data were excluded. Poorly processed specimens and inadequate biopsy material were not taken in to account. Brief demographic and clinical data were noted from the case records, which included the age, presenting symptoms, serum PSA levels and clinical diagnosis.

All the prostatic specimens were subjected to a careful and detailed gross examination. Representative sections of formalin fixed tissue were processed by routine paraffin embedding technique. Tissue sections of 4-6 μ thickness were cut and stained by hematoxylin & eosin (H & E) stains. Histopathological examination was done and a diagnosis was rendered. For the histopathology report format CAP Protocol was followed [8]. We employed WHO updated classification system [9] to classify tumors and the Gleason grading system [10] for tumor grading. The data were statistically analyzed.

Results and Observation

The present study included total 50 prostatic specimens, among them 21(42%) were TURP specimens, 13 (26%) were tru-cut core needle biopsy specimens and 16 (32%) were prostatectomy specimens. Out of sixteen prostatectomy specimens, 9 cases pertained to simple prostatectomy and 7 to subtotal prostatectomy (Table 1).

Majority of lesions were observed in the patients with age group of 61 to 70 years with mean and median age being the 68.1 and 68.5 years respectively (Table 2). Out of total 50 prostatic specimens, 44 (88%) and 6 (12%) cases were diagnosed as benign lesions and prostatic malignancy respectively.

Nodular hyperplasia of prostate was the most frequent histopathological diagnosis seen in 41(82%) patients. Prostatitis was associated with 30 (60%) cases of nodular hyperplasia of prostate, out of which 22 cases were of chronic non-specific prostatitis and 8 cases were of acute prostatitis. Two cases of non-specific granulomatous prostatitis were observed (Table 3).

Among the malignant lesions, all 6 cases of prostatic carcinoma were of acinar type. Gleason score 7 was the commonest score found (N=4, 66.6%) followed by Gleason score 8 (N=2, 33.3%). Out of 6 cases of adenocarcinoma, 3 cases showed perineural invasion. In present study, all cases of prostatic carcinoma had S.PSA level >10 ng/ml (Table 4).

Table 1: Distribution of Prostatic lesions (N=50)

		Number (percentage)	Benign	Malignant
TURP		21 (42%)	21	0
Needle core biopsy		13 (26%)	9	4
Prostatectomy	Simple	9 (18%)	9	0
	Subtotal	7 (14%)	5	2
Total		50 (100%)	44	6

Table 2: Age wise distribution of the Prostatic lesions (age in years)

Age range (years)	Number of cases (n)	Percentage (%)
41-50	3	6%
51-60	7	14%
61-70	23	46%
71-80	13	26%
81-90	3	6%
>90	1	2%
Total	50	100%

Table 3: Histopathological diagnosis of prostatic lesion

Prostatic lesion	Number (n)	Percentage (%)
Benign Lesions (N=44, 88%)	BPH	12 (24%)
	BPH with acute prostatitis	8 (16%)
	BPH with chronic prostatitis	22 (44%)
	Granulomatous prostatitis	2 (4%)
Malignant Lesions (N=6, 12%)	Adenocarcinoma of prostate, acinar type	6 (12%)
Total		50 (100%)

Table 4: Analysis of acinar adenocarcinoma cases of prostate according to modified gleason grading system

Case	Age (years)	Psa (ng/ml)	Type of specimen	Gleason primary and secondary grades with score	Grade group	Pn invasion
1.	70	113	Tru cut core needle biopsy	4+4=8	4	Present
2.	65	104	Tru cut core needle biopsy	4+3=7	3	Present
3.	66	92	Tru cut core needle biopsy	4+4=8	4	Absent
4.	85	122	Prostatectomy	4+3=7	3	Absent
5.	60	118	Prostatectomy	4+3=7	3	Absent
6.	78	100	Tru cut core needle biopsy	4+3=7	3	Present

Discussion

Benign prostatic hyperplasia and Adenocarcinoma are two pathological lesions which frequently affect the prostate gland. The incidence of prostatic lesions increase with the advancing age. In this study, transurethral resections of prostate (TURP) specimens were received in majority of cases. TURP is preferred surgery for nodular hyperplasia of prostate as it is simple, cost effective and convenient procedure which requires less equipment, can be done under local anesthesia, and has fewer complications as compared to open prostatectomy. In our study most of the specimens

received were TURP (42%). Similar findings were noted in the studies done by Mittal *et al.* [11] and Shakya *et al.* [12]. In the present study, peak frequency of benign & malignant prostatic lesions was observed in 61-70 years of age. Studies done by SD Birare *et al.* [13], Anushree *et al.* [14] and Deshmukh *et al.* [15] also found highest cases in 7th decade. In present study, out of total 50 cases studied, 88% were benign and 12% were malignant lesions. Benign prostatic lesions were common in comparison to malignant lesions. Our findings are comparable with other studies done by Bhatta S *et al.* [16] and Deshmukh *et al.* [15]. (Table 5).

Table 5: Frequency of benign and malignant lesions

Histopathological Category	Present study	Bhatta S <i>et al.</i> [16]	Deshmukh <i>et al.</i> [15]
Benign lesions	88%	89.58%	92.04%
Malignant lesions	12%	8.34%	7.96%

Among the benign lesions, BPH was the most frequent histopathological diagnosis accounting for 82% cases in present study. Prostatitis was associated with 30 (60%) cases of nodular hyperplasia of prostate, out of which 22 (73.3%) cases were of chronic non-specific prostatitis and 8 (26.7%) cases were of acute prostatitis. Two cases of non-specific granulomatous prostatitis were also observed. A study done by Deshmukh *et al.* [15] showed BPH with chronic prostatitis, BPH, BPH with acute prostatitis and Granulomatous prostatitis in 30.43%, 11.60%, 3.86% and 1.93% of cases respectively. In our study, prostatic carcinoma were found in 6 (12%) cases. All these 6 cases were of adenocarcinoma with acinar type. In the study done by Deshmukh *et al.* [15], SD Birare *et al.* [13] and Bhatta S *et al.* [16], the frequency Adenocarcinoma of prostate were reported to be 9%, 5.7% and 8.34% respectively of all prostatic lesions. These studies also revealed acinar type of adenocarcinoma as the principal variant of prostatic cancer. In the present study, the most common Gleason Score reported was 7. Our findings are similar with studies done by Babaian *et al.* [17] and Falzarano *et al.* [18].

Prostate specific antigen (PSA) is secreted by prostatic epithelial cells. In prostatic cancer, the PSA concentration is increased in majority of cases, depending on the tumor volume. Measurement of the serum PSA is the most sensitive marker available for monitoring the progression of prostate cancer. PSA is specific for prostatic tissue, but not specific for prostatic cancer. In present study, all cases of prostatic carcinoma had S.PSA level >10 ng/ml. A study done by Krishna T *et al.* [19] show >50% cases having S.PSA level >10 ng/ml.

Perineural invasion is a pathognomic feature of prostate cancer. In the present study, perineural invasion was seen in 3 (50%) cases. Study conducted by Bhatta S, *et al.* [16] observed perineural invasion in 37.5% cases.

Conclusion

Benign prostatic lesions are more common than malignant lesions and commonly occur in seventh decade. Histopathological examination of lesions plays an important role in diagnosis and prognostication and thus in management of the patients. Early diagnosis and treatment helps to reduce mortality and morbidity due to prostatic lesions.

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