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A Study of Benign and Malignant Lesions of Prostate in a Tertiary Care Hospital

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Abstract
Background: *Prostatic disease is responsible for significant morbidity and mortality in men throughout the world. The current study is undertaken to assess the spectrum of tumors affecting the prostate and the utility of clinical and pathological correlation in the diagnosis of the same.*
Material and Methods: *The present study was done on 174 cases of various lesions of the prostate over a period of 5 years in the Department of Pathology. All the prostatic specimens were subjected to a careful and detailed gross examination. 10% formalin fixed and paraffin embedded tissue sections from these specimens were used for microscopic study*
Result: *Out of the 174 cases of the various lesions of the prostate, 164[94.26%] cases were benign and 7 [4.02%] cases were malignant.*
Conclusions: *Histopathology plays a pivitol role in diagnosing prostatic lesions, classifying them in to benign, and malignant and to study the salient features of each lesions.*
Keywords: *neoplasm, prostrate, hyperplasia, malignancy, biopsy.*

Introduction

Three pathologic processes affect the prostate gland with sufficient frequency to merit discussion; inflammation, benign nodular enlargement and tumors. Of these three, the benign nodular enlargement are by far the most common and occur so often in advanced age that they can be almost construed as a "normal" ageing process. Prostatic carcinoma is also an extremely common lesion in men and therefore merits careful consideration. Adenocarcinoma of the prostate is the most common form of cancer in men and is an second leading cause of cancer death. In addition to these lethal neoplasms, there is an even more frequent anatomic form of prostatic cancer-occult carcinoma, in which a microscopic focus of cancer is discovered as an incidental finding, either at postmortem examination or in a surgical specimen

removed for other reasons.[1] The current study is undertaken to assess the spectrum of tumors affecting the prostate and the utility of clinical and pathological correlation in the diagnosis of the same.

Aims and objectives of the study

1. To study and analyses the spectrum of tumours of the prostate in our Tertiary Care hospital
2. To find out the incidence of various tumours of the prostate in our institute.
3. To study prostatic tumours in relation to clinical and pathological characteristics.

Methodology

The present study is a 2 years retrospective and 3 years prospective study undertaken in Department of Pathology, during the period of January 2008 to May 2012. This study was conducted on 174 prostatic specimens referred to department of pathology. Brief clinical data was noted from the case records, which included age, clinical symptoms, digital rectal examination findings and clinical diagnosis. Following inclusion and exclusion criteria are adopted in this study. Inclusion criteria: All types of specimens including TURP and prostatectomy are included in this study. Exclusion criteria: Inadequate biopsies and poorly preserved prostatic specimens are excluded in this study. All the prostatic specimens were subjected to a careful and detailed gross examination. 10% formalin fixed and paraffin embedded tissue sections from these specimens were used for microscopic study. 4-6 µ thick sections being prepared and stained routinely with H&E. H&E stains were studied and classified into various benign and malignant lesions. Different types of carcinoma were analysed under light microscope. Histological grade for each type of adenocarcinoma using the Gleason grading system and Gleason's histologic sco.es were noted. Associated prostatic tissue changes like tumour invasion, PIN and other prostatic lesions were also analysed. All the specimens were subjected to a detailed study with special reference to the features mentioned in the proforma and the staining of the histological sections was done using standard procedures.

Observations

Cases of various prostatic lesions were studied from our institute mover a period of 5 years The tumours were classified according to the classification recommended by the World Health Organisation, International Histological typing of prostate tumours.

Table 1 shows the numbers of various prostatic lesions, their percent incidence in 174 cases studied in the present study.

Incidence of 174 Cases of Prostatic Lesions

	Type of Prostatic Lesion	No, of cases
I]	**BENIGN TUMOURS**	---
II]	**TUMOUR LIKE LESIONS**	164 [94.26%]
	Benign Prostatic Hyperplasia	
a	Without associated inflammation	117 [71.34%]
b	With associated chronic nonspecific prostatitis	29 [17.68%]
c	With associated acute nonspecific prostatitis	01 [0.61%]
d	With associated acute on chronic prostatitis	09 [5049%]
e	With associated acute on chronic prostatitis with abscesss	---
f	With associated eosinophilic prostatitis	02 [1.22%]
g	With associated granulomatous prostatitis	03 [1.83%]
h	With focal xanthomatous reaction	01 [0.61%]
i	With associated chronic nonspecific prostatitis with infarction	---
j	With associated prostatic intraepithelial neoplasia	02 [1.22%]
III]	**MALIGNANCIES**	07 [4.02%]
1)	**Adenocarcinoma**	07 [100%]
a	Small acinar	05 [71.42%]
b	Large acinar	---
c	Cribrifrom	01 [14.29%]
d	Solid/trabecular	01 [14.29%]
e	Others	---
2)	**Squamous cell carcinoma**	---
IV]	**INFLAMMATORY**	03 [1.72%]
1	Nonspecific granulomatous prostatitis	01 [33.33%]
2	Granulomatous prostatitis	02 [66.67%]
	TOTAL	**174 [100%]**

Benign Prostatic Hyperplasia (164 Cases i.e. 94.26%) form the major group, followed by Carcinoma of Prostate (7 Cases i.e. 4.02%), followed by Inflammatory Lesions (3 cases i.e. 1.72%). All cases i.e. 7 (100%) were of Adenocarcinoma of Prostate. Maximum number of cases 76 (46.34%) of benign hyperaplasia were seen in the seventh decade followed by 58 (35.36%)

cases in the eighth decade. 16 (9.76%) cases were found in the sixth decade, 12 (7.32%) cases were found in the ninth decade and 2 (1.22%) in the fifth decade .Maximum number of cases of Carcinoma of Prostate were found in the 7th decade (3 cases i.e. 42.86%) followed by 9th decade (2 cases i.e. 28.56%). 1 case each (14.29%) were found in the 6th and 8th decade. We found 2 (66.67%) cases of benign prostatic hyperplasia with granulomatous prostatitis in the seventh decade of life following by 1 (33.33%) case in the eighth decade of life. We found 1 (50%) case of benign prostatic hyperplasia associated with low grade prostatic intraepithelial neoplasis in the eighth decade of life and 1 (50%) case in the ninth decade.. All the 3 (100%) cases of inflammatory lesions of the prostate were seen in the seventh decade of life. Morphological classification of patterns (types) of Hyperplasia in cases of benign prostatic hyperplasia was done. Fibromyoadenomatous type of hyperplasis was found in majority of cases i.e. 158 (96.34%), followed by fibroadenomatous hyperplasia which was found in 5 (3.05%). 1 case (0.61%) was of fibromuscular hyperplasia. No case of hyperplasia of muscular tissue i.e. stromal nodule was noted. In fibromyoadenomatous type (158 cases i.e. 96.345), cases hyperplasia of both acini and stroma was found. The acinar cells were tall columnar with poorly defined boundaries, abundant finely granular or homogenous eosinophilic cytoplasm and basal nuclei. At paces the acini were lined by double layered epithelium. Some of the glands showed papillae protruding into the lumen. The stroma was loose and fibromuscular. In fibroadenomatous type (5 cases i.e. 3.05%), the predominatnt hyperplasia ws of the glandular component. Microscopically, acini were lined by cuboidal to columnar cells with poorly defined boundaries, abundant finely granular or homogenous eosinophilic cytoplasm and basal nuclei. At places, the acini were lined by double layered epithelium. Some of the glands showed papillae protruding into the lumen. The glands were closely packed together and the stromal component was minimal. In fibromuscular type (1 case i.e. 0.61%), the hperplasitc nodules were predominantly stromal, composed of loose mesenchyme containing prominent small round vessels. The nodules were relatively aglandular. Analysis of cases of carinoma of prostate was done according to Greason score. We have found maximum number of Score 5 and 6 (2 cases i.e. 28.57%). Scores 2, 4 and 10 comprised 1 case each i.e. 14.29%. We did not find any case of Score 3, 7, 8 and 9.Benign prostatic hyperplasia associated with low grade prostatic intraepithelial neoplasia. Grossly had nodular appearance and firm in consistency. Cut section showed gray white appearance with few slit like spaces.

Microscopically, there was glandular and stromal hyperplasia. The epithelium of few acini showed cell crowding, stratification, enlarged and hyperchromatic nuclei but no prominent nucleoli. The basement membrane of the acini was intact. The stroma showed infiltration by mononuclear cells. In case of prostatitis associated with benign prostatic hyperplasia, chronic nonspecific prostatitis accounted for maximum number of cases i.e. 29 (64.44%). Chronic inflammatory infiltrate was scant to moderate. Some of the glands showed dilatation and flattening of the epithelium. Acute nonspecific prostatitis was found in 1 (2.22%) case of benign prostatic hyperplasia. This case showed acinar and stromal hyperplasia. Collection of polymorpho-nuclear cells and necrotic debris was seen in the lumen of the glands. The lining epithelium of most of the glands was destroyed. The exudate was also found in the surrounding stroma around the destroyed glands. 9 (20%) cases of benign prostatic hyperplasia were associated with acute on chronic prostatitis. Microscopicaly, glandular and stromal hyperplasia was found. The inflammatory infiltrate contained polymorphs along with lymphocytes and plasma cells. There was damage to the lining epithelium of some glands and plasma cells, and the infiltrate was found in the surrounding stroma of the damaged zone. The periacinar tissue showed variable degree of fibrosis in these cases.

Eosinophilic prostatitis was found in 2 (4.44%) cases of benign prostatic hyperplasia. These cases showed acinar and stromal hyperplasia. The stroma showed diffuse aggregates of inflammatory

infiltrate comprising predominantly of eosinophils, lymphocytes and plasma cells.3 (6.67%) cases of benign prostatic hyperplasia were associated with granulomatous prostatitis. Microscopically, glandular and stromal hyperplasia was found. Some glands showed luminal aggregates of foamy histiocytes. There was granulomatous inflammation due to rupture of ducts and acini. The stroma showed foci of lymphoplasmacytic infiltrate.1 (2.22%) case of benign prostatic hyperplasia with focal xanthomatous reaction was seen. Microscopically, glandurlar and stromal hyperplasia was found. Some of the glands showed foamy macrophages. The stroma showed foci of chronic inflammatory infiltrate. Squamous metaplasia occurred in 8 (47.06%) cases, transitional metaplasia occurred in 8 (47.06%) cases and combined squamous and transitional metaplasia was seen in 1 (5.88%) case.In the present study, we found squamous metaplasia in 8 (47.06%) cases of benign hyperplasia of prostate. The lining of the acini was found to be either partially or totally replaced by the squamous metaplasia. In some areas, tendency of keratin formation was noted. In most cases, only few glands showed squamous metaplasia. We studied transitional metaplasia in 8 (47.06%) cases of benign prostatic hyperplasia. The transitional metaplasitc cells occupied the glands either partially or totally. We found squamous and transitional metaplasia in 1 (5.88%) case of benign prostatic hyperplasia. Few glands showed squamous metaplasia and few glands were lined by transitional metaplasitc cells. We found 1 (33.33%) case of nonspecific granulomatous prostatitis. Microscompically, lumina of few glands showed nuclear debris, polymorphonuclear cells and histiocytes. The stroma showed a dense mixed inflammatory infiltrate comprised of lymphocytes, plasma cells, histiocytes, eosinophils and multinucleated foreing body giant cells. 2 (66.67%) cases of granulomatous prostatitis were seen. Microscopically, the stroma showed presence of numerous epithelioid cell granulomas along with Langhan's type and foreign body type of giant cells and a dense lymphoplasmacytic infiltrate. The most common clinical symptom was increased frequency in 132 (75.86%) patients, followed by retention of urine in 124 (71.26%) patients. Burning micturition was seen in 30 (17.84%) patients followed by hesitancy in 12 (6.9%) patients. 8 (4.6%) Patiens complained of dribbling of urine, 5 (2.88%) patients complained of hematuria followed by 3 (1.72%) patients complaining of fever with chills.

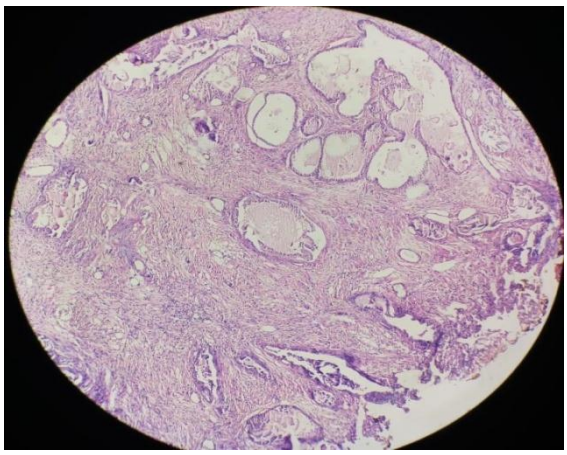

Figure 1 Benign Prostratic Hyperplasia: Section reveal proliferation of galnds lined by two layered epithelium and stroma (HE X 200)

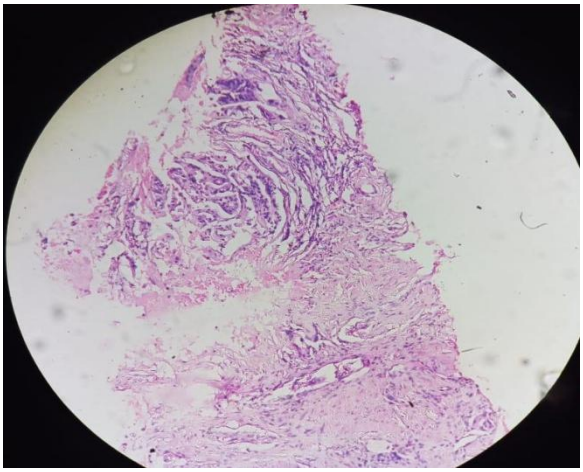

Figure 2- Prostatic adenocarcinoma: Section reveal adenocarcinoma infiltrating the stroma.
(H and E X 200)

Discussion

The present study was done on 174 cases of various lesions of the prostate over a period of 5 years in the Department of Pathology. Out of the 174 cases of the various lesions of the prostate, 164[94.26%] cases were benign and 7 [4.02%] cases were malignant

Incidence of Benign & Malignant Lesions of Prostate on Histological Basis

Hostological Findings	Jewett & Baltimore et al[2] series [1956]	Matapur kar et al[3] [1969]	Chitale A. R. series[4] [1992]	Ibrathim et al [5][2003]	Mohammed et al[6] [2005]	Sadia Hameed et al[7][2010]	Muham-med Abrar Barakz ai et al[8] [2011]	CC Obiorah et al[9] [2011]	Present Study [2012]
Cases studied	211	1100	7165	535	493	540	54	529	174
BPH	108 51.18%	622 56.18%	5831 81.3%	440 82.2%	372 75.4%	467 86.48%	30 55.6%	331 62.6%	164 94.26 %
Malignancy of Prostate	103 48.82%	94 8.15%	790 11%	54 10%	121 24.6%	71 13.15%	24 44.4%	198 37.4%	7 4.02%
Negative for Malignancy						2 0.37%			

In the present study, we found 94.26% cases of benign prostatic hyperplasia and 4.02% cases of malignancy of prostate. The findings of our study are in approximation with those of Chitale A.R. series[4], Ibrahim et al[5] and Sadia Hammed et al[7]. The low percentage of malignancies in the present study may be due to a comparatively smaller sample size. Moore et al[10], G.C. Sharma[11] and Sadia Hameed[7] reported maximum incidence in the 7th decade of life i.e. 57.0%, 50.57% and 48.5% respectively followed by the 6th decade i.e. 23.0%, 32.18% and 23.2% respectively. Matapurkar & Taneja et al [3] reported maximum incidence i.e. 36.70% cases in the 6th decade followed closely by the 7th decade i.e. 35.12%.Birkoff et al[12] found maximum incidence in the 8th decade of life followed by the 7th decade of life. In our study, the highest incidence of cases i.e. 46.34% is reported in the 7th decade of life and our study is comparable to that of Moore et al [10], G.C. Sharma et al[11] and Sadia Hameed et al[7]. The incidence of benign prostatic hyperplasia with chronic nonspecific prostatitis as reported by Ibrahim et al[5] is 24.9%, by Mohameed A Z et al[8] is 23.6% and by Sadia Hameed[7] is 40%.Our study shows an incidence of 66.67% which does not match with the above mentioned studies. The incidence of Benign prostatic hyperplasia with acute nonspecific prostatitis were studied. Ibrahim Mansoor et al[5] [2003] studied 535 cases of prostatic diseases and found 17 cases, i.e. 3.1%.Sadia Hameed et al[7] [2010] studied 540 cases of prostatic disease and found 5 cases i.e. 1.07%. In the present study we have found 1 case i.e. 2.22% which is comparable with the mentioned studies. The incidence of granulomatous prostatitis as reported by various authors is as follows: The incidence of granulomatous prostatitis as reported by Keuhnelian & Culling et al[13] was 4%, by Chitale A R[4] 0.4%, by Ibrahim Mansoor[5]was 0.9%, by Mohan H et al [14] was 1.48% and Sadia Hameed[7] was 0.2%.In our present study we found 1.72% as the incidence of granulomatous prostatitis and is comparable with the observations of Mohan H et al [14] and Ibrahim Mansoor [5] et al. Kelalis et al[15] studied 70 cases of granulomatous prostatitis and found the maximum incidence in the 7th decade of life i.e. 44.27% followed by the 6th decade. Mohan H et al[14] studied 10 cases of granulomatous prostatitis and found the maximum incidence in the 7th decade of life i.e. 44.27% followed by the 8th decade. In our series the maximum incidence was found in the 7th decade and is comparable it that of the study by Kelalis et al[15] and Mohan H et al[14]. Nusret Akpolat [16] studied 17 cases of low grade PIN and found the maximum incidence in the 8th decade of life i.e. 41.18%. D. Gharimagar et al[17] studied 12 cases of granulomatous prostatitis and found the maximum incidence in the 5th decade of life i.e. 33.33%. In our series equal incidence was found in the 8th and 9th decade i.e. 50% each, and is not comparable with either of the two above studies. The incidence of carcinoma of prostate as reported by various authors is as follows. The incidence of Carcinoma of Prostate as reported by Bauer et al [18] is 6.5%, Bhajekar et al [19] is 10.6%, G.C. Sharma et al [11] is 13%, Robin et al [20] is 8.6%, Ibrahim et al[5] is 10% and CC Obiorah et al[9] is 37.4%. Our findings are in close approximation with those of Bauer et al[18] [1960]. This range of 4-6% can be explained based on comparatively smaller sample size of the present study. Adenocarcinoma of the

prostate is the commonest type of malignancy encountered in the prostate. The incidence of adenocarcinoma as reported by various authors are as follows.Matapurkar et al[3] reported 66.7% of adenocarcinoma of prostate, Chitale A.R. et al[4] reported 95.95%, Mohammed et al[6] [2005] reported 94.2% and Ibrahim et al[5] [2003], Sadia Hameed et al[7] [2010], CC Obiorah et al[9] [2011] reported a 100% incidence of prostatic adenocarcinoma. In the present study, the incidence of adenocarcinoma was 100% which is comparable with that of Ibrahim et al[5] [2003], Sadia Hameed et al[7] [2010], and CC Obiorah et al[9] [2011]. The age incidence of carcinoma prostate were studied. Nasr Al A[21] , Matapurkar and Taneja[3], and Sadia Hameed[7] found the maximum number of cases (42.86%, 33.67%, 56.3%) respectively in the 7th decade of life. The 2nd most frequent no of cases i.e. 23.86% observed by Nasr Al. A[21] and 26% observed by Sadia Hameed[7] were in 8th decade whereas Matapurkar and Taneja[3] observed the 2nd most frequent number of cases i.e. 31.63% in the 6th decade. Godwin O lfere et al [22], CC Obiorah et al [9], Gaynor [23] and Frank D et al[24] found the maximum no of cases i.e. 48.84%, 35.09%, 40.4%, 35.08% and 38.15% respectively in the 8th decade of life followed by 28.68%, 32.63%, 29.3%, 28.27% and 30.27% in the 7th decade of life. Thus, the above studies indicate that the highest incidence of carcinoma of the prostate in India is in the 7th decade of life, life in foreign countries the highest incidence is found in the 8th decade of life. In our study, the highest incidence of cases of prostate are found in the 7th decade i.e. 42.86%. Our findings are comparable with those of other studies by Indian Authors i.e. Nasr Al A [21] [1966] and Matapurkar and Taneja[3][1969], and Sadia Hameed et al [7] [2010].Growth pattern of carcinoma prostate were also studied. Edwared et al[25] [1953] studied 36 cases of adenocarcinoms and found 10 cases [27.78%] showing small acinar pattern, 9 cases [25%] showing large acinar pattern 14 cases [38.89%] showing mixed pattern i.e. small and large acinar arrangement of glands and 3 cases [8.33%] showing solid or trabecular pattern. No case in the series was found to have cirbriform pattern. Bean & Yatani et al[26] research group studied 118 cases of adenocarcinoma in 1973 and observed maximum cases i.e. [87.29%] showing small acinar pattern, followed by 13 [11.02%] cases showing cribriform pattern. Minimum number of cases i.e. 2 [1.69%] showed solid/trabecular pattern. No case showed large acinar or mixed pattern. CC Obiorah et al[9] studied 198 cases of adenocarcinoma in 2011 and observed maximum cases i.e. 106 [53.5%] showing large acinar pattern, followed by 35 [17.7%] cases showing small acinar pattern, 31 [15.7%] cases showing solid or trabecular pattern and 26 [13.2%] cases showing cribriform pattern. In our study, the maximum no. of cases were of the small acinar type i.e. 5 [7.42%] followed by both, cribriform type and the solid/trabecular type showing 1 case [17.29%] each. No case with large acinar or mixed pattern was observed. Since the number of cases of our studyare very few, the observations are not comparable.

Analysis of cases of carcinoma of prostate according to Gleason Score was done.

Authors	Gleason's score	Number of patients	percentage
Babaian Richard et al [2001][27]	6 7 8 9 10	12 1 1 0 0	85.72% 7.14% 7.14%
Mawakyoma H A et al [2010][28]	2-4 5-7 8-10	6 69 38	5.31% 61.06% 33.63%
Sadia Hameed et al [2010][7]	2-4 5-7 8-10	28 25 18	39.4% 35.2% 25.4%
Present Study	2-4 5-7 8-10	2 4 1	28.57% 57.14% 14.29%

In a study conducted by Babaian Richard et al [27] [2001], 12(85.72%) cases had Gleason's score of 6, and 1 (7.14%) case each were seen with score of 7 and 8 each. In a study by Mawakyoma H A et al [28] [2010], only 6 (5.3%) had a score of 2-4, and the majority of the patients, 69 (61.1%) had Gleason's score of 5-7 while 38 (33.6%) had Gleason's score of 8-10. Study conducted by Sadia Hameed et al [7] showed that 28 (39.4%) patients had Gleason's

score between 2-4, 25 (35.2%) patients had Gleason's score between 5-7 and 18 (25.4%) patients had Gleason's score between 8-10.In our present study 2 (28.57%) had a score of 2-4, and the majority of the patients, 4 (57.14%) had Gleason's score of 5-7 while 1 (14.29%) patient had Gleason's score of 8-10. Our study is comparable to that of Mawakyoma H A et al[28].

Conclusions

The commonest prostatic lesion encountered was benign prostatic hyperplasia. [164 cases, incidence 94.26%], followed by malignancy of the prostate [7 cases, incidence 4.02%] and lastly inflammatory lesions of the prostate [3 cases incidence, 1.72%]. The maximum incidence of benign prostatic hyperplasia was observed in the 7th decade followed by 8th decade of life with commonest symptoms of frequency, retention, burning micturition and hesitancy. The fibromyoadenomatous hyperplasia predominated in the benign prostatic hyperplasia with an incidence of 96.34%, i.e. 158 cases. Amongst the inflammatory lesions associated with benign prostatic hyperplasia, the highest incidence was found with chronic non specific prostatitis, i.e. 29 [17.28%] cases, followed by acute on chronic non specific prostatitis i.e. 9 [5.49%] cases. Granulomatous prostatitis was associated with benign prostatic hyperplasia in 3 [1.83%] cases. The highest incidence was noted in the 7th decade of life.Acute prostatitis associated with benign prostatic hyperplasia was found in 1 cases, i.e. [0.61%].Two cases, i.e. 1.22% of eosinophilic prostatitis were associated with benign prostatic hyperplasia.One case, i.e. 0.61% of prostatitis with focal xanthomatous reactions was associated with benign prostatic hyperplasia.2 cases, i.e. 1.22% benign prostatic hyperplasia was associated with low grade prostatic intraepithelial neoplasia. One case was observed in the 8th decade of life and one case was observed in the ninth decade of life.The most frequest malignancy observed in prostate was adenocarcinoma [7 cases, incidence 100%]The maximum incidence of malignancy of prostate was seen in the 7th decade of life followed by the 9th decade.Among the 7 prostatic adenocarcinomas, 4 (57.14%) cases had Gleason's score of 5-7, 2 (28.57%) had a score of 2-4 while 1 (14.29%) patient had Gleason's score of 8-10.3 cases, i.e. 1.72% of inflammatory lesions of the prostate were seen. Amongst the pure inflammatory lesions, the highest incidence was found with granulomatous prostatitis i.e. 2 [66.67%] cases, followed by 1 [33.33%] case of nonspecific granulomatous prostatitis. All the granulomatous lesions of the prostate were observed in the seventh decade of life.

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