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HISTOMORPHOLOGICAL STUDY OF NON-NEOPLASTIC LESIONS OF THE PROSTATE

Pathology

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ABSTRACT

Background-The main lesions of prostate are benign prostatic hyperplasia (BPH), chronic prostatitis and adenocarcinoma. BPH is the most common benign lesion above 50 years of age often associated with chronic inflammation which is thought to be involved in development of BPH. It is useful to study various morphological features of hyperplasia of epithelium and stroma in this condition to understand their significance and to avoid misdiagnosis of cancer.

Material And Method- 96 transurethral resection of prostate (TURP) specimens were studied in the Postgraduate department of Pathology, Acharya Shri Chander College of Medical Sciences (ASCOMS) and Hospital, Jammu over a period of two years wef November 2017 to October 2019. The specimens received were fixed in 10% formalin, embedded in paraffin, cut into 4-6 µ sections and stained with Hematoxylin and Eosin stain. Histopathological slides of the specimens were reviewed under light microscope. The findings were analyzed as the type of specimen, age of patient, histopathological pattern and diagnosis.

Results- Benign prostatic hyperplasia (BPH) was most commonly seen in 7th and 8th decades of life. Glandulostromal nodules were the most common pattern (75.47%), followed by predominantly stromal hyperplasia (7.54%). Basal cell hyperplasia and clear cell cribriform hyperplasia was present in 3.77% and 2.83% cases of BPH respectively. Squamous metaplasia was noted in 7.54% and transitional cell metaplasia in 2.83%. Chronic inflammation of moderate to severe degree was observed in 18.75% and granulomatous prostatitis in 2.08% in cases of BPH.

KEYWORDS

BPH, Prostatitis, Prostatic lesions

INTRODUCTION

Prostate gland is a pear shaped accessory reproductive organ in males, encircling the neck of urinary bladder and urethra. It weighs up to 20 gm in normal adult male. The prostatic parenchyma is composed of three distinct zones- peripheral (70%), central (25%) and transitional (5%) **(1).** The prostate is composed of glandular epithelium and fibromuscular stroma. Hyperplasia mostly arises in the transitional zone, whereas most carcinomas originate in the peripheral zone **(2).**

Of the diseases which affect prostate, the most frequently encountered in clinical practice is benign prostatic hyperplasia (BPH).

BPH is the most common urologic disorder in men beyond 50 years of age and is almost always present in men aged 80-90 years age group. Clinical incidence is 8% during 4th decade but reaches 50% in 5th decade and 75% in 8th decade **(3).** Advanced age and intact androgen supply are the only undisputed risk factor for the development of BPH. The main androgen in the prostate, constituting 90% of total prostatic androgens, is dihydrotestosterone (DHT). DHT is formed in the prostate from testosterone through the action of an enzyme called 5 alpha-reductase. Stromal cells are responsible for androgen dependant prostatic growth. Necrosis of prostatic glands associated with chronic inflammation is thought to play a role in the genesis of BPH **(4).** Microscopically, there is hyperplasia of glandular and stromal tissue forming nodules. Hyperplasic glands are lined by two cell layers, an inner columnar layer and outer layer composed of flattened basal cell.

The present study is analysis of various morphological features of BPH and chronic prostatitis including granulomatous prostatitis associated with it.

MATERIAL AND METHODS-

96 transurethral resection of prostate (TURP) specimens were studied in the Postgraduate department of Pathology, ASCOMS and Hospital, Jammu over a period of two years wef November 2017 through October 2019. The specimens received were fixed in 10% formalin, embedded in paraffin, cut into 4-6 µ sections and stained with Hematoxylin and Eosin stain. Histopathological slides of the specimens were reviewed under light microscope. The findings were analyzed as type of specimen, age of patient, histopathological pattern and diagnosis.

RESULTS

96 TURP specimens diagnosed as BPH were analyzed.

Table 1 Age Wise Distribution Of BPH (N=96)

HISTOLOGIC DIAGNOSIS	41-50 yrs	51-60 yrs	61-70 yrs	71-80 yrs	81-90 yrs	Mean age yrs
BPH	03	24	36	30	03	67.2

Prevalence of BPH alone was the highest in 7th decade with mean age of 67.2 years. Only 3.12% patients with BPH alone were below 50 years of age **(table 1).**

Table 2 Histomorphological Spectrum In BPH (N=96)

Variant	No. Of Cases	Percentage
Fibroleiomyoglandular hyperplasia	80	75.47
BHP with stromal hyperplasia	08	7.54
Atypical adenomatous hyperplasia	07	7.29
Cystic atrophy	15	15.62
BPH with squamous metaplasia	08	7.54
BPH with basal cell hyperplasia	04	3.77
BPH with transitional cell hyperplasia	03	2.83
BPH with clear cell cribriform hyperplasia	03	2.83

Table 2 depicts histomorphological features of BPH including variant benign proliferative lesions associated with it.

In majority of the BPH cases, varying proportions of glandular and stromal hyperplasia was seen which constituted 75.47% of all BHP cases with predominance of adenomatous hyperplasia **(fig 1).** Stromal nodules **(fig 2)** constituted 7.54%, consisting of spindle cells with thin walled vessels. Occasional predominant leiomyomatous hyperplasia was seen mimicking leiomyoma. Well circumscribed nodules of adenosis composed of small glandular structures seen in 7.29% cases of BPH. Foci of prostatic atrophy consisting of variably sized glands lined by flat epithelial cells and scant cytoplasm were noted in 15.62% cases. The next variant of BHP observed was BHP with squamous metaplasia **(fig 3)** which constituted 7.54% of total cases with BHP. Basal cell hyperplasia **(fig 4)** was seen in 3.77% whereas transitional cell hyperplasia **(fig 5)** and clear cell cribriform hyperplasia **(fig 6)** was seen in 2.83% of cases in each.

Table 3 Type Of Prostatitis (N=20)

TYPE	NO. OF CASES	PERCENTAGE
CHRONIC	18	90
GRANULOMATOUS	2	10

Table 3 Depicts Types And Frequency Of Chronic Inflammation

Accompanying BPH.

All the cases of prostatitis were noted in association with BHP, constituting 16.98% of all the cases. Chronic inflammation was present in 90% cases **(fig 7).** In 2 cases chronic inflammation was accompanied by acute inflammation. Chronic inflammation was multifocal and diffuse accompanied by stromal oedema and hyperaemia. Minor degree of chronic was not reported. Granulomatous prostatitis **(fig 8)** was present in 2 cases (10%). Picture was non-specific in one case. Well formed epithelioid cell aggregates with giant cells without necrosis was present in other case. However, ZN stain for AFB was negative.

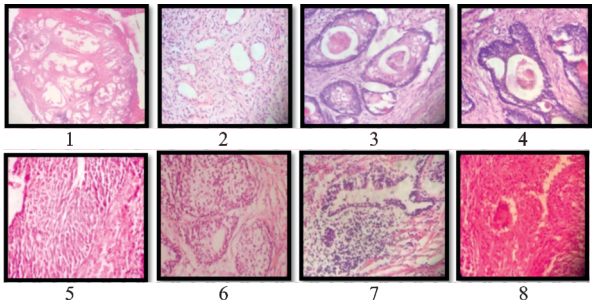

fig 1. Adenomyomatous nodule in BHP (H&Ex40); **fig 2.** Spindle Cells and thin walled vessels in stromal nodule (H&Ex100); **fig 3.** Squamous metaplasia (H&E100); **fig 4.** basal cell metaplasia (H&Ex100); **fig 5** Transitional cell metaplasia (H&Ex400); **fig 6.** Clear cell cribriform metaplasia (H&Ex100); **fig 7.** Chronic inflammation (H&Ex100); **fig 8.** Granulomatous prostatitis showing epithelioid cells with giant cells (H&Ex100).

DISCUSSION

BPH is a disease of advancing age. Most of the patients are above 50 years of age. BPH was seen most commonly in 61-70 yrs age group (37.5%) followed by 71-80 years age group (31.25%) of all cases of BHP with mean age of 67.20 years.

Most of the studies have reported similar age group for BPH. **Arya *et al* (2015)** reported maximum number of cases in age group of 61-70 (42.5%) **(5).**

The pattern of morphological changes in BPH consists of fibroleiomyoadenomatous hyperplasia with predominance of glandular elements, admixture of glands and stroma or leiomyomatous tissue forming nodules. Fibroglandular hyperplasia is the most common pattern in different studies ranging from 40% to78.50 of all BPH cases. **Angurana (2014)** found fibroglandular hyperplasia in 78.50% cases **(6).** 3/4th of BPH cases in our series showed fibroglandular nodules. Stromal nodules constituted 7.54%, consisting of spindle cells with thin walled vessels. Occasional predominant leiomyomatous hyperplasia was seen mimicking leiomyoma. Atrophy of prostate is a common lesion mostly seen in older patients. Cystic atrophy was present in15.62% of cases. Atypical adenomatous hyperplasia was seen7.29% of cases, which may be confused with prostatic carcinoma. BPH was accompanied by squamous metaplasia (7.54%), basal cell hyperplasia (3.77%), transitional cell hyperplasia (2.83%) and clear cell cribriform hyperplasia (2.83%). Prostatic hyperplasia is mainly stromal in younger individuals, becoming glandulostromal in older subjects. Acute or chronic prostatitis associated with glandular necrosis correlates positively with stromal reparative changes which lead to stromal hyperplasia. Epithelial hyperplasia may result from glandular regeneration, and basal hyperplasia, papillary hyperplasia and cribriform hyperplasia all show significant correlation with prostatic intraepithelial neoplasia **(7).**

Some of the complex proliferations, including atypical adenomatous hyperplasia, basal cell hyperplasia and post-atrophic hyperplasia can mimic cancer and require immunohistochemical stain like high molecular weight cytokeratin (HMWCK) to rule out carcinoma **(8).** Transitional metaplasia can be a pitfall for high grade PIN (prostatic intraepithelial neoplasia) and is distinguished by the presence of nuclear elongation and grooves, as well as inconspicuous nucleoli **(9).** Squamous metaplasia occurs in normal prostatic glands, as well as in a variety of reactive settings such as adjacent to prostatic infarcts and in hormonally treated prostates **(10).**

Chronic inflammation was observed in 18/106 (16.98%) cases accompanying by acute inflammation in 2 cases (1.88%) of all cases of BPH. Graulomatous inflammation was noted in 2 cases (1.88%). Picture was non- specific in 1 case. Well formed epithelioid cell aggregates with giant cells without necrosis was present in the other case. However, ZN stain for AFB was negative. **Fatima *et al* (2019)** found chronic inflammation in 31.81% cases of BPH **(11).** Minor degree of chronic inflammation need not be reported. Incidence of granulomatous prostatitis in benign prostate specimens is around 0.5-1%. **Mohan et al (2005)** revealed 1.5% incidence of granulomatous prostatitis which is in agreement with our observation **(12).** Patients present with irritating voiding symptoms, fever, chills and obstructive voiding symptoms. Non- specific granulomatous prostatitis mimics prostate cancer on rectal examination and ultrasound, and result in elevated PSA level. The earliest lesion consists of dilated ducts and acini filled with neutrophils, debris and foamy histiocytes. Rupture of the ducts and acini results in localized granulomatous and chronic inflammatory reaction. Infectious etiology should be ruled out with special stains.

CONCLUSION:

BPH is the predominant histopathological lesion of prostate followed by BPH with prostatitis. Histology reveals a variety of morphological changes with predominance of glandulorstromal hyperplasia. Some of these benign changes like basal cell hyperplasia, cribriform hyperplasia and may show correlation with PIN and need to be differentiated from cancer.

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