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A Study of Histopathological Patterns in Transurethral Resection of the Prostrate Specimens

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ABSTRACT
Recent technological developments have led to the definition of premalignant lesions. It is crucial to routinely assess known benign lesions in order to reevaluate any connection or potential influence known benign lesions may have on malignant or premalignant prostatic illness. light of the growing body of knowledge regarding prostatic lesions. Hence, the study. The patient profile comprised all inpatient and outpatient samples that were received. Retrieving tissue blocks and H and E stained tissue slides, as well as looking over the slides, were all part of evaluating 100 TURP patients. Different histological patterns were looked at in each instance and grouped by age. Following histologic analysis, the tumors were graded according to the modified Gleason method, in compliance with WHO criteria. In the current inquiry, there were 100 overall incidents. Prostatic specimens were classified as non-neoplastic 92% of the time and malignant 8% of the time. Then, each group was further broken into separate categories using well-established classification schemes. Papillary hyperplasia and the glandulostromal pattern were the most often discovered histologic patterns. It was shown that BPH co-occurred with chronic prostatitis in about 25% of the people who were evaluated. The only histological cancer type identified in this investigation was adenocarcinoma. To detect premalignant lesions, proliferative activity and the degree of inflammation, all TURP must be periodically evaluated. Use of a modified Gleason system should be attempted to boost management capacity. In particular in low socioeconomic areas, histochemistry was employed as an added benefit to identify benign from malignant disorders.

INTRODUCTION

A fibromusculo glandular structure called the prostate encircles the neck of the urinary bladder. Therefore, nodular hyperplasia, prostatic intraepithelial neoplasia, or adenocarcinoma-related prostate growth or enlargement may cause bladder outlet obstruction[1].

The prostate greatly contributes to seminal fluid because it is an exocrine gland. Histologically, it consists of glands lined by basal cuboidal cells and inner, double-layered secretory columnar cells[1]. Micturition and incontinence are common complaints among individuals with benign lesions. The three disorders that affect the prostate that are most frequently observed in clinical practice are BPH, prostate cancer and prostatitis. Benign prostatic hyperplasia is relatively common in men over the age of 50 and has notable regional and ethnic variations in incidence and mortality. The notion of a high incidence of prostate cancer across diverse geographic and racial groups worldwide during the past two decades has contributed to the huge increase in interest in prostate disorders[2]. The three prostate-related disorders that are most frequently observed in clinical practice are benign prostatic hyperplasia, prostatic cancer and prostatitis. Recent technological developments have led to the definition of premalignant lesions. It is critical to routinely assess known benign lesions in order to reevaluate any connection or effect they may have on malignant or premalignant prostatic disease. light of the growing body of knowledge regarding prostatic lesions. Prostatic transition zone connective tissue, smooth muscle and glandular epithelium develop out of control, leading to the histological diagnosis of prostatic hyperplasia (BPH)[3]. Rarely, granulomatous prostatitis is visible in prostate specimens. Inflammatory lesions had a 3.3% incidence of granulomatous prostatitis in 1943, the year it was first identified, according to Tanner and Mc Donald. The 20 cases of granulomatous prostatitis that Harsh Mohan *et al*. studied[4] included two instances of tuberculous prostatitis. Alterations in epithelial proliferation are connected exposing the nearly all epithelial cells to carcinogenesis cancers. proliferation and regeneration, also called proliferative inflammatory atrophy (PIA) in the prostate, has been hypothesized to constitute a premalignant lesion. The idea postulates that injury brought on by germs or chemicals, such as dietary carcinogens, induces inflammation and the production of reactive oxygen species (oxidative stress), which results in cellular injury and regeneration that is typical of PIA. The renewing cells are more likely to mutate, which increases the likelihood that cancer will develop, spread and become more advanced[5]. A limited growth of tiny glands inside the prostate called atypical adenomatous hyperplasia (AAH) might be confused for cancer. It was impossible to reliably identify AAH from cancer using factors such lesion morphology, chromatin pattern and quantity, circumscription, multifocality, average gland size, diversity in gland size and form, or tinctorial quality of cytoplasm. Although it can usually be distinguished from cancer thanks to its light microscopic properties, the biological significance of AAH is uncertain[6].

Prostate cancer is the sixth most common cause of cancer death in men and the second most common disease diagnosed globally. In India, it accounts for roughly 5% of all male malignancies[7]. The modified Gleason system appears to be more accurate at predicting than the original Gleason system following radical prostatectomy for progression-free survival. Up to 27% of prostate tumors were diagnosed before the PSA era because mistakenly found during TURP[8]. Transurethral resection of prostate (TURP) specimens account for a large fraction of diagnostically challenging cases in surgical pathology. The principal use of the well-known urological procedure known as TURP is the surgical treatment of an enlarged prostate.Trans-rectal ultrasonography (TRUS), digital rectal examination (DRE), serum prostate specific antigen (PSA) measurement and TRUS-guided needle biopsies of the prostate are all helpful in evaluating people with prostatic diseases[3,4]. Crucial clinical examination and history are also crucial[4,5]. However, the histological examination of the prostatic tissue plays a significant role in the final diagnosis and classification of prostatic illnesses. When analyzing prostatic carcinoma, serum PSA levels are an important investigation since high levels and a pattern of increases imply the likelihood of cancer[5,6]. Since androgen is a critical participant in the development of both disorders, anti-androgen therapy is an essential part of treatment for both aden of ibroleiomyomatous hyperplasia and prostate cancer. Despite not being a cause of prostatic cancer, benign prostatic hyperplasia may be related to prostate cancer that appears in the transition zone. A tumor in a TURP specimen could be an uncommon carcinoma of the transitional zone or it could be a widespread conventional malignancy of the gland's peripheral zone. Histochemistry of the prostate mucins has proven to be extremely helpful, particularly in locating an acid mucin that may be somewhat cancer-specific[9]. The goal of this study was to comprehend the variety of histomorphological lesions better.

MATERIALS AND METHODS

This analytical inquiry adhered to all moral standards. The selection of the data was randomized using computer tables. The secondary and tertiary

medical care institutions in the area, including ones like ours with complete pathological, cytological, histopathological and urological surgical units, participated in this cross-sectional analytical inquiry. Data from randomly selected Pathological, Cytological and Histopathological Units were collected during a three-year period. The patient profile comprised all inpatient and outpatient samples that were received. Retrieving tissue blocks and H&E stained tissue slides, as well as looking over the slides, were all part of evaluating 100 TURP patients. Different histological patterns were looked at in each instance and grouped by age. The modified Gleason system was employed for histologic grading after the tumors had undergone histologic evaluation and the tumors were then classed in accordance with WHO criteria.

Notes involved Detail clinical history and significant findings.

The aforementioned variables were specifically looked at:

- **Histological patterns:** Histological The term "glandostromal" was used to describe patterns when there was substantial glandular proliferation over stromal tissue or when the ratio of proliferating glands to fibromuscularstroma was thought to be nearly equal. Whenever there were more stromal components than glands in the sections, if they were totally made of stromal elements, they were referred to as "stromal" sections
- Prostatitis, an inflammatory condition that affects the prostate glands in both acute and chronic forms

Acute: Neutophils with in glands.

Chronic:

- Non specific, mononuclear infiltrate
- Granulomatous

- **Necrotic glands:** The existence or absence of specific necrotic glands was recorded. Nearly often, an area-wide inflammatory infiltration engulfed or removed these glands.
- Various epithelial hyperplasia types were investigated and according to their predominant glandular and glandulostromal patterns, they were classified as Papillary, Basal and Cribriform lesions
- The fifth condition is AAH stands for atypical adenomatous hyperplasia. determining whether atypical hyperplasia exists was present, the Epstein[10] criteria were applied. In a nutshell, it is a newly formed nodular focus of proliferating acini or alveoli around a duct branch. Multiple small acini developing within of a duct-acinar unit is one of its defining features. The cells are secretory epithelial cells with cuboidal to columnar shapes that frequently have clean cytoplasm and minimal to no nuclear pleomorphism
- **Proliferative inflammatory atrophy:** In Marzo *et al*.[11] classification scheme, atrophy was broken down into four categories: Simple atrophy, simple atrophy-cyst development and post-atrophic hyperplasia and partial atrophy. According to the criteria proposed by Nickle *et al*.[12] the level of inflammation (focal, multifocal, diffuse), as well as its intensity (mild, moderate and severe), were assessed
- **carcinoma prostate:** Prostate cancer was also found and it was classified according to its morphology and modified Gleason Grading, which was carried out in accordance with the modified Gleason system adopted by the International Society of Urological Pathology in 2005[13]
- **Using alcian blue stain on prostate and BPH cancer:** After the blocks were removed, sections of 5 micron thickness were cut out and stained with Alcian blue at a PH of 2.5. Acid mucin with blue coloration and blueish black nuclei were observed

In Microsoft Excel, continuous data were entered and presented as mean standard deviation (SD). The data were examined using IBM SPSS Statistics 23. Overall, it was considered that after correction, $p<0.05$ would denote statistical significance.

RESULTS

In the current inquiry, there were 100 overall incidents. Prostatic specimens were classified as non-neoplastic 92% of the time and malignant 8% of the time. Then, each group was further broken into separate categories using well-established classification schemes. The distribution of cancerous and non-cancerous cells lesions by age is shown in Table 1.

The BPH was the most prevalent determining the age group with the most people and lesions was 61-70 years old, with a median age of 63.38 years at presentation (correlating well with the study by Garg *et al*.[7].

The most common form of hyperplasia was glandulostromal. Prevalent histological characteristic to appear (Fig. 1). Rarely, prostate tissues will exhibit granulomatous prostatitis. Acute prostatitis was linked to BPH in 4% of patients (Fig. 4) and chronic prostatitis in 24% of instances (Fig. 3). With foci of necrosis and granulomas with Langhan's big cells, we characterize

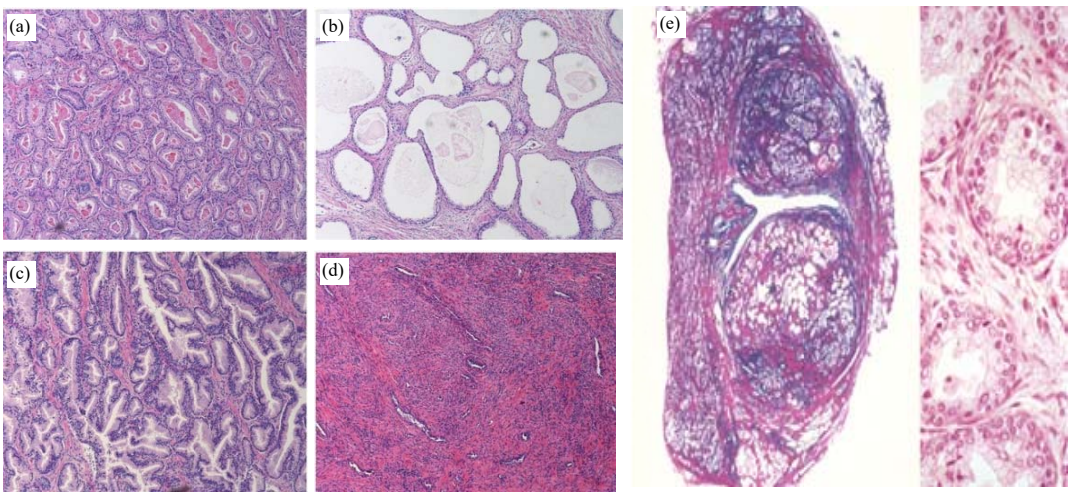

Fig. 1(a-d): Representative images of H and E stained histology (same magnification used) of transition zone prostate cancer (Gleason 3+4 shown) and different benign prostatic hyperplasia (BPH) types: Cystic, glandular and stromal, (a) Prostate cancer, (b) Cystic BPH, (c) Glandular BPH (d) and Stromal BPH

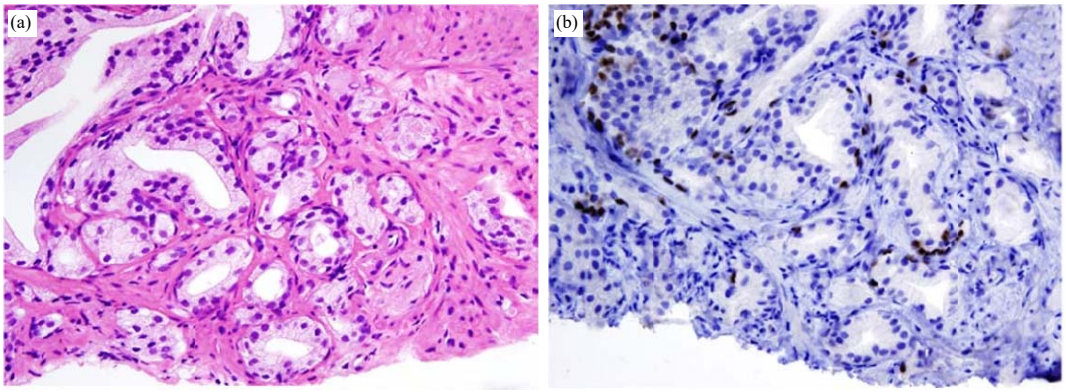

Fig. 2(a-b): Atypical adenomatous hyperplasia (AAH), (a) Small glands forming a lobule without significant cytologic atypia and (b) Patchy basal cell staining (HMWCK) in AAH

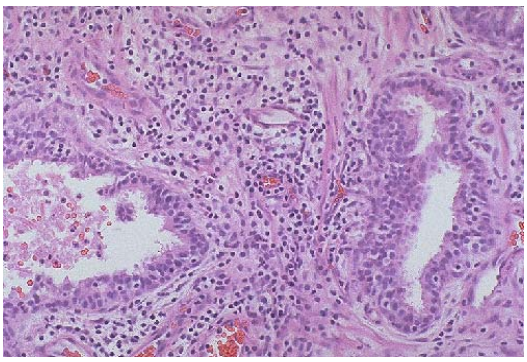

Fig. 3: This is the microscopic appearance of chronic prostatitis
Numerous small dark blue lymphocytes are seen in the stroma between the glands

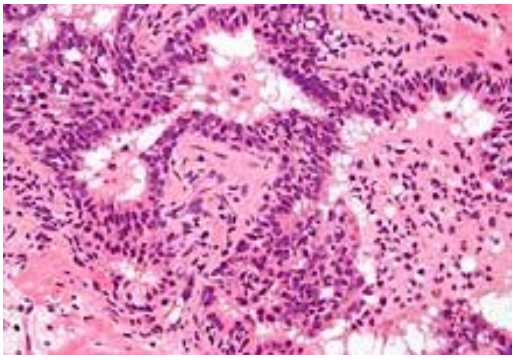

Fig. 4: The histologic correlate of acute prostatitis, (H and E Stain)

2% of the cases of granulomatous prostatitis in our study, Ziehl-Nelsen staining was negative for AFB.

Papillary hyperplasia, basal cell hyperplasia and atypical adenomatous hyperplasia (Fig. 2) are all present in 34% of patients (Table 3). Proliferative

Table 1: The age distribution of neoplastic and non neoplastic lesions

Age (years)	Non neoplastic (n = 92%)	Neoplastic (n = 8%)
40-50	5	
50-60	29	4
61-70	41	4
71-80	15	
81-90	2	
Total	92	08

Table 2: Different variables of Inflammation

Variable (inflammation)	No. of cases (%)
Type of inflammation present	
• Acute	2
• Chronic	12
Grade of inflammation	
• None	4
• Mild	31
• Moderate	11
• Sever	4
Extent of inflammation	
• None	4
• Focal	31
• Multifocal	11
• Diffuse	4
Granulomatous inflammation	1
Proliferative inflammatory atrophy	3

Table 3: Histological types

Glandular					
Papillary (%)	Basal (%)	Cribriform (%)	AAH (%)	Glandulo stromal (%)	Stromal (%)
Type of hyperplasia					
34	12	2	8	40	8

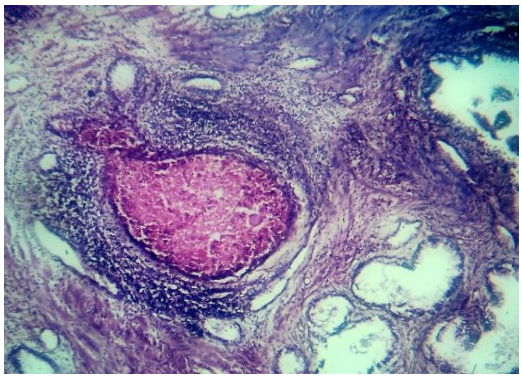

Fig. 5: NECC Lymphoid aggregate around necrotic foci (H and E stain)

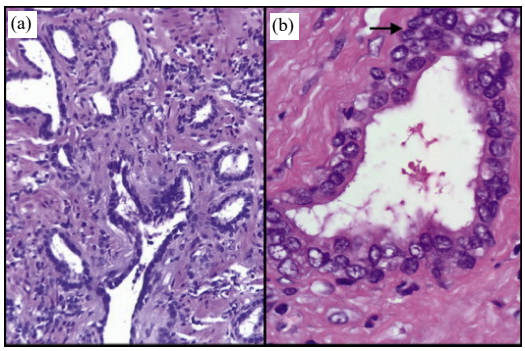

Fig. 6(a-b): Both showing proliferative inflammatory atrophy

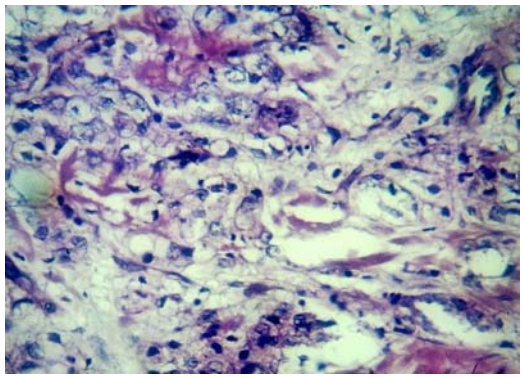

Fig. 7: Positive alcian blue in carcinoma prostate

inflammatory atrophy (PIA, Fig. 6) was present in 6% of the individuals. Scattered necrotic glands (Fig. 5) were discovered in 40% of cases. These necrotic glands typically displayed periglandular lymphoid aggregation, which can range in intensity from dispersed produce fully developed lymphoid follicles from lymphocytes. Rarely did necrotic glands come together. In Table 2, we included four cases of prostate cancer. In addition to nuclear enlargement, hyperchromasia and a loss of glandular differentiation, which is made up of single cells, cables and solid sheets., the TURP procedure revealed. (Gleason, modified for grade 5) (Fig. 8). The second most frequent kind consists of large transparent cells that grow in a diffuse pattern with occasional gland growth. Gleason modified grade 5 plus 4 equals 9.

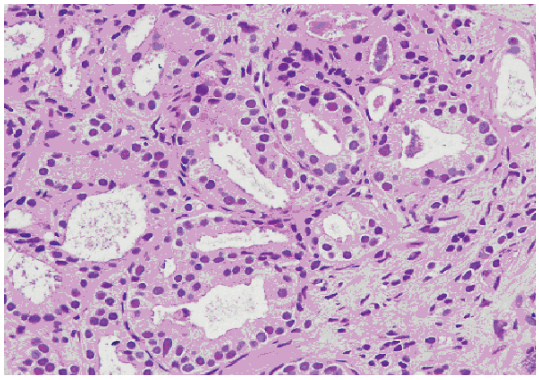

Fig. 8: Well differentiated prostate carcinoma (H and E X200)

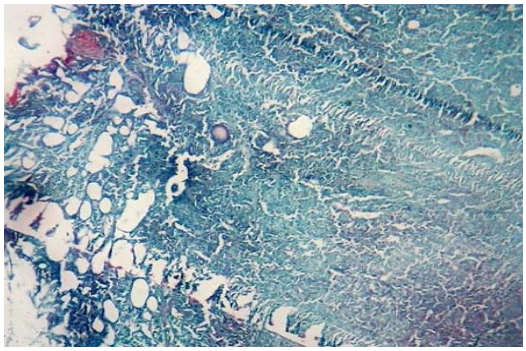

Fig. 9: Negative Alcian blue in BPH (H and E stain)

In certain cases, TURP histology showed a more dominating pattern of glands invading the surrounding stroma in various sizes. The majority of glands were quite small in size. (Gleason modified grade 3) The second most frequent pattern consists of sheets of pleomorphic cancer cells with hyperchromaticnuclei. Gleason modified grade 5 plus 3 equals 8.

All BPH patients tested negative for alcian blue staining (Fig. 9). In the meantime, it was discovered that acidic mucin in prostate cancer was Alcian blue positive (Fig. 7 and 10).

DISCUSSIONS

This study highlights significant relationships and connections between a variety of BPH-related observable traits. We discovered that 92% of the total (100 instances) were benign lesions and 8% were malignant lesions, in contrast to research in Nigeria[14], reports from Ethiopia, where the ratio is 3:1 and Sudan, where the ratio is 49:118. the regions of Nigeria and other African nations where this study was conducted have confirmed past results that the prevalence of BPH peaked in the seventh decade. The research on benign prostate disorders conducted in Kuwait and the histological pattern of prostatic

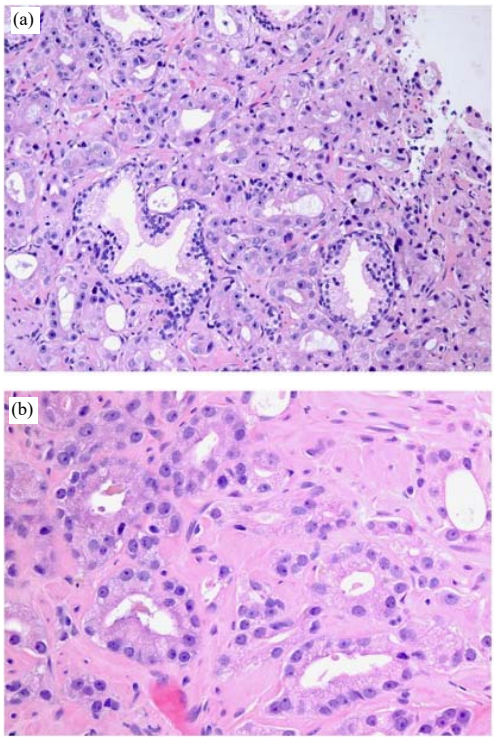

Fig. 10(a-b): Alcian blue in carcinoma prostate (H and E stain)

diseases conducted in Nigeria[14], where the majority of individuals displayed a glandulostromal pattern, are compatible with the histologic subtypes of BPH discovered. In line with past similar research, it was shown that BPH and chronic prostatitis co-occurred in about 25% of the individuals investigated. However, investigations conducted in Kuwait and Nigeria, where the prevalence was 49.1%, showed that the proportion of cases with acute prostatitis was essentially equal. The various prostatitis assessment criteria are most likely to blame for the variation. Prostatitis is frequently discovered in Depending on the used diagnostic criteria, 11-98% of prostatic specimens. Papillary hyperplasia 15 was the most prevalent type of epithelial hyperplasia that was observed. A number of researchers have described the epithelial changes connected to BPH. About 1.6-7.3% of TURP tissues without cancer contain 5AAH. AAH is typically found next to benign nodular hyperplasia in the transition zone of the prostate[16].

Although, the actual cause of granulomatous prostatitis is yet unknown, it is likely idiopathic. Prostatic cancer made up 2 instances in the current study, or 8% of total cases. A small departure from the earlier study by Otto *et al*.[17], in which histologically confirmed prostate cancer in 1.4% of individuals.

The only histological kind of cancer identified in this study was adenocarcinoma. analysis and it was also the most common type elsewhere in the world[14].

The findings of this study are in line with those of prior investigations, which demonstrated that Alcian blue staining in prostate cancer samples reflects the existence of acid mucin discharges, which are more frequently present in malignant than benign prostate lesions. Acid mucin can be seen in malignant cells of a higher grade[9].

CONCLUSION

Given the rise Prostate cancer mortality and incidence rates must be reduced, hence improved diagnosis must be prioritized. To identify proliferative activity, the presence of premalignant lesions and the degree of inflammation, all TURP must be periodically evaluated. Use of a modified Gleason system should be attempted to boost management capacity. We also come to the conclusion that the range of prostatic lesions, from the benign to the malignant end, demonstrates a rise in proliferative activity and invasiveness. Particularly in areas with poor socioeconomic status, the use of histochemistry provided an added benefit in differentiating benign from malignant disorders.

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