

Histomorphological Study of Transurethral Resection of Prostate (TURP) Specimens with Incidental Detection of Prostatic Adenocarcinoma: A Retrospective Study from a Tertiary Care Centre in Northeast India

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Abstract: Background: Benign prostatic hyperplasia (BPH) is the most common pathological condition affecting the ageing prostate and is a major cause of lower urinary tract symptoms. Transurethral resection of the prostate (TURP) is the standard surgical procedure for symptomatic BPH. Histopathological examination of TURP specimens not only confirms benign pathology but may also reveal unsuspected prostatic adenocarcinoma, thereby influencing further patient management. Objective: To evaluate the histomorphological spectrum of TURP specimens and determine the incidence and histopathological characteristics of incidentally detected prostatic adenocarcinoma. Materials and Methods: A retrospective observational study was conducted in the Department of Pathology, Assam Medical College, Dibrugarh, over a 14-month period from June 2024 to July 2025. Fifty-five TURP specimens received from patients clinically diagnosed with benign prostatic hyperplasia were included. Routine haematoxylin and eosin-stained sections were examined for histomorphological diagnosis. Incidentally detected carcinomas were graded using the Gleason grading system and classified into Grade Groups. Results: Among 55 TURP specimens, benign prostatic hyperplasia was identified in 48 (87.3%) cases, while incidental prostatic adenocarcinoma was detected in 7 (12.7%) cases. The majority of patients belonged to the 60–69-year age group. Of the seven malignant cases, five occurred in patients aged 60–69 years and two in those aged 70–79 years. Grade Group 1 (Gleason score 3+3=6) was the commonest histological grade, accounting for three cases. Conclusion: Histopathological examination of all TURP specimens remains essential, as clinically unsuspected prostatic adenocarcinoma may be detected incidentally. Accurate microscopic evaluation and Gleason grading facilitate appropriate postoperative management and prognostication, emphasizing the indispensable role of routine pathological assessment.

Keywords: Benign prostatic hyperplasia, Transurethral resection of prostate, Incidental prostatic adenocarcinoma, Histopathology

1. Introduction

Benign prostatic hyperplasia (BPH) is one of the most common disorders affecting elderly men and represents the leading cause of lower urinary tract symptoms. The prevalence of BPH increases steadily with advancing age, affecting approximately half of men in their sixth decade and nearly three-fourths of men over 80 years of age. Although BPH is a benign proliferative process involving both glandular and stromal components of the transitional zone, its clinical manifestations significantly impair quality of life by causing urinary frequency, urgency, nocturia, hesitancy, and incomplete bladder emptying.

The prostate is composed of peripheral, central, transitional, and periurethral zones, each demonstrating distinct anatomical and pathological characteristics. While benign hyperplasia predominantly arises within the transitional zone, prostatic adenocarcinoma most commonly develops in the peripheral zone. Consequently, early carcinoma may remain clinically silent and undetected during routine evaluation, particularly in patients presenting with symptoms attributable to BPH.

Transurethral resection of the prostate (TURP) continues to be the standard surgical treatment for patients with symptomatic BPH who fail medical therapy or develop complications such as recurrent urinary retention. Besides relieving bladder outlet obstruction, TURP provides tissue for histopathological examination, allowing definitive diagnosis of benign lesions and detection of unsuspected malignant pathology. Routine microscopic examination of TURP specimens frequently demonstrates a spectrum of histological changes ranging from nodular hyperplasia and chronic inflammation to premalignant lesions and incidental adenocarcinoma.

The widespread use of prostate-specific antigen (PSA) estimation, digital rectal examination, and transrectal ultrasound has improved the early detection of prostate carcinoma. Nevertheless, incidental carcinoma remains an important clinical entity, particularly in patients undergoing TURP for presumed benign disease. Such tumours are often asymptomatic and may not be suspected clinically before surgery. Their identification has important therapeutic and prognostic implications because tumour grade and extent influence decisions regarding surveillance, definitive treatment, and long-term follow-up.

Several studies have reported varying incidences of incidental prostatic adenocarcinoma in TURP specimens, reflecting differences in patient demographics, screening practices, and pathological examination protocols. Evaluating the histomorphological spectrum of TURP specimens in different populations therefore remains important for understanding local disease patterns and determining the burden of occult malignancy.

The present retrospective study was undertaken in the Department of Pathology, Assam Medical College, Dibrugarh, to evaluate the histomorphological features of TURP specimens and determine the incidence and grading pattern of incidentally detected prostatic adenocarcinoma in patients undergoing surgery for clinically diagnosed benign prostatic hyperplasia.

2. Materials and Methods

Study Design and Setting

This retrospective observational study was conducted in the Department of Pathology, Assam Medical College, Dibrugarh, Assam. The study evaluated the histomorphological spectrum of TURP specimens received during the study period with emphasis on the incidental detection of prostatic adenocarcinoma.

Study Duration

The study was carried out over a period of 14 months from June 2024 to July 2025.

Study Population

The study included patients who underwent transurethral resection of the prostate (TURP) for clinically diagnosed benign prostatic hyperplasia (BPH). A total of 55 TURP specimens were examined.

Inclusion Criteria

All TURP specimens received in the Department of Pathology during the study period.

Exclusion Criteria

Needle biopsy specimens of the prostate.

All prostatectomy specimens.

Histopathological Examination

All specimens were received in 10% neutral buffered formalin and processed according to standard histopathological protocols. Paraffin-embedded tissue blocks were prepared, and sections of approximately 4–5 μ m thickness were stained with haematoxylin and eosin (H&E). Microscopic examination was performed to identify benign and malignant lesions. Cases diagnosed as prostatic adenocarcinoma were graded according to the Gleason grading system and assigned the corresponding Grade Group.

Data Collection

Patient demographic details, age distribution, histopathological diagnosis and Gleason grade of incidental carcinoma were retrieved from departmental records and analysed.

Statistical Analysis

The collected data were entered into Microsoft Excel and analysed using descriptive statistics. Categorical variables were expressed as frequencies and percentages.

Ethical Considerations

The study was conducted after obtaining approval from the Institutional Ethics Committee of Assam Medical College and Hospital.

3. Results

A total of 55 TURP specimens were evaluated during the study period. Benign prostatic hyperplasia was the predominant histopathological diagnosis, accounting for 48 (87.3%) cases, while 7 (12.7%) cases showed incidental prostatic adenocarcinoma.

Table 1: Age-wise Distribution of Benign and Malignant Lesions

Age Group (years)	Benign Lesions (n)	Malignant Lesions (n)	Total
<50	1	0	1
50–59	7	0	7
60–69	25	5	30
70–79	13	2	15
≥80	2	0	2
Total	48	7	55

The majority of patients belonged to the 60–69-year age group (30 cases, 54.5%), followed by the 70–79-year age group (15 cases, 27.3%). Among benign lesions, the highest frequency was observed in patients aged 60–69 years (25 cases). Of the seven incidental carcinomas, five occurred in patients aged 60–69 years and two occurred in the 70–79-year age group.

Table 2: Histopathological Distribution of TURP Specimens

Histopathological Diagnosis	Number	Percentage (%)
Benign Prostatic Hyperplasia	48	87.3
Incidental Prostatic Adenocarcinoma	7	12.7
Total	55	100

The overall histopathological distribution demonstrated that benign lesions constituted the vast majority of TURP specimens, whereas incidental adenocarcinoma represented approximately one-eighth of all cases.

Table 3: Distribution of Incidental Prostatic Adenocarcinoma According to Gleason Grade

Grade Group	Gleason Score	Number of Cases
Grade Group 1	3+3 = 6	3
Grade Group 2	3+4 = 7	0
Grade Group 3	4+3 = 7	0
Grade Group 4	4+4 = 8	1
Grade Group 4	5+3 = 8	1
Grade Group 5	5+4 = 9	2
Total		7

Among the seven cases of incidental carcinoma, Grade Group 1 (Gleason score 3+3=6) was the commonest histological grade (3 cases). Higher-grade tumours included one Grade Group 4 tumour with Gleason score 4+4, one Grade Group 4 tumour with Gleason score 5+3, and two

Grade Group 5 tumours with Gleason score 5+4. No cases belonged to Grade Groups 2 or 3.

Histopathological Findings

Microscopic examination of benign lesions demonstrated nodular proliferation of glandular and stromal components consistent with benign prostatic hyperplasia. The glands were lined by a dual epithelial layer comprising basal and secretory cells with variable cystic dilatation and fibromuscular stromal hyperplasia. Representative photomicrographs are shown in Figures 1 and 2.

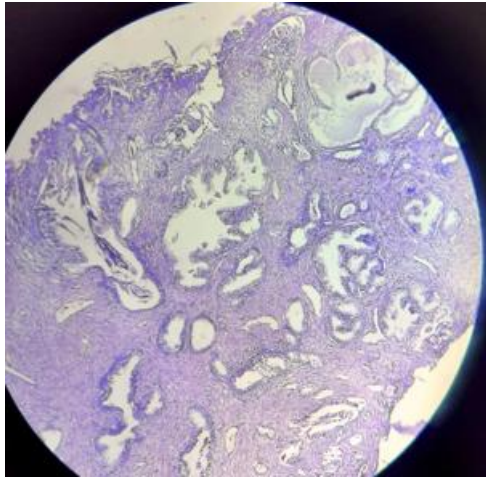


Figure 1: Benign prostatic hyperplasia showing nodular glandular and stromal hyperplasia (H&E stain, ×10).

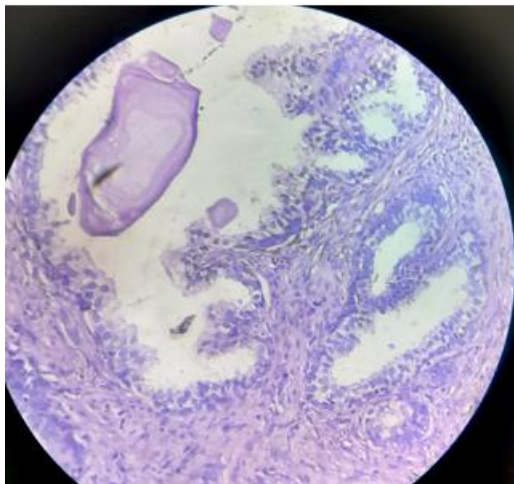


Figure 2: Benign prostatic hyperplasia demonstrating glandular proliferation with preserved bilayered epithelium (H&E stain, ×40).

In contrast, incidental prostatic adenocarcinoma showed infiltrating malignant glands with loss of the basal cell layer, nuclear enlargement, prominent nucleoli and varying architectural patterns corresponding to the assigned Gleason grades. Representative photomicrographs are shown in Figures 3 and 4.

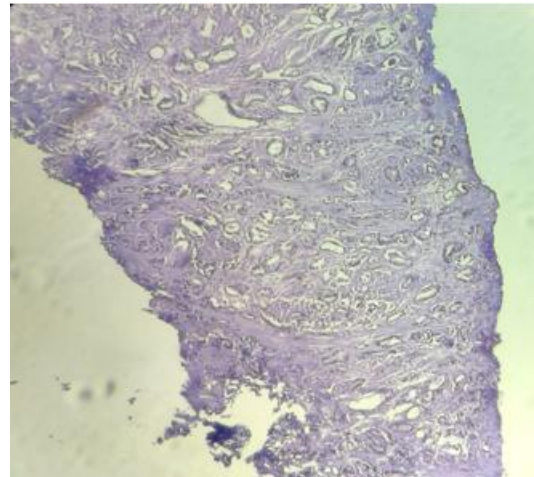


Figure 3: Incidental prostatic adenocarcinoma (Gleason Grade 5), low-power photomicrograph (H&E stain, ×10).

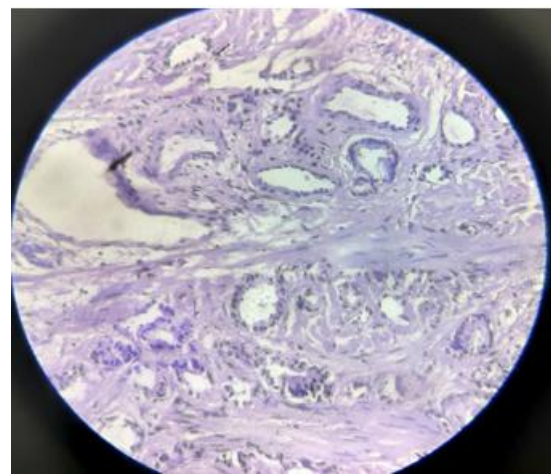


Figure 4: Incidental prostatic adenocarcinoma (Gleason Grade 5), high-power photomicrograph showing infiltrating malignant glands (H&E stain, ×40)

4. Discussion

The present retrospective study evaluated the histomorphological spectrum of transurethral resection of prostate (TURP) specimens with special emphasis on the incidental detection of prostatic adenocarcinoma. Histopathological examination remains the gold standard for establishing the definitive diagnosis of prostatic lesions and plays an indispensable role in identifying clinically unsuspected malignancies in patients undergoing TURP for presumed benign prostatic hyperplasia (BPH).

In the present study, 48 of the 55 TURP specimens (87.3%) were diagnosed as benign prostatic hyperplasia, whereas 7 cases (12.7%) revealed incidental prostatic adenocarcinoma. These findings reaffirm that BPH constitutes the predominant pathological lesion encountered in TURP specimens, while a clinically significant proportion of patients harbour occult carcinoma that remains undetected during preoperative clinical evaluation.

The majority of patients in the present study belonged to the 60–69-year age group, which also accounted for the highest number of benign lesions. Similarly, most incidental carcinomas were identified in the same age group, followed

by patients aged 70–79 years. These observations indicate that advancing age continues to be the principal demographic factor associated with both benign prostatic enlargement and the occurrence of incidental carcinoma.

The incidence of incidental prostatic adenocarcinoma observed in the present study (12.7%) is higher than that reported in several published series included in the study presentation. Varghese et al. reported an incidence of 5.2%, Rijhwani et al. documented 6.89%, while Özdemir et al. observed an incidence of 4.3%. These differences may be attributed to variations in patient age distribution, sample size, screening practices, referral patterns, and histopathological sampling protocols among different institutions.

With respect to tumour grading, Grade Group 1 (Gleason score 3+3=6) was the most frequently encountered category, accounting for three of the seven malignant cases. Two patients demonstrated Grade Group 4 disease, while two patients had Grade Group 5 tumours. The predominance of lower-grade tumours suggests that many incidentally detected carcinomas are identified at an early pathological stage, although the presence of high-grade lesions in a subset of patients highlights the clinical importance of meticulous histopathological examination of all TURP specimens.

Routine histopathological examination of TURP chips therefore serves a dual purpose. Besides confirming benign prostatic hyperplasia, it facilitates the diagnosis of occult carcinoma, enables Gleason grading, and provides essential information for risk stratification and subsequent clinical management. The findings of the present study support the continued practice of comprehensive microscopic evaluation of all TURP specimens, irrespective of the preoperative clinical diagnosis.

Table 4: Comparison of the Present Study with Published Literature

Study	Country	Sample Size	Incidental Carcinoma (%)	Predominant Finding
Varghese et al.(2016)	India	597	5.2	Highest incidence in 70–79 years
Rijhwani et al.(2023)	India	58	6.89	Majority in 60–69 years
Özdemir et al.(2020)	Turkey	391	4.3	Higher incidence in ≥70 years
Present study	India	55	12.7	Majority in 60–69 years; Grade Group 1 most common

Strengths of the Study

The present study provides recent data from a tertiary care centre in Northeast India regarding the histomorphological spectrum of TURP specimens. It also highlights the burden of incidentally detected prostatic adenocarcinoma in routine surgical practice and emphasizes the importance of Gleason grading in pathological reporting. These findings contribute to the limited regional literature on incidental prostate carcinoma.

5. Limitations

The study was retrospective in nature and conducted at a single tertiary care institution with a relatively small sample size of 55 cases. Long-term clinical follow-up, serum PSA correlation, radiological findings, and patient outcomes were not included in the presentation and therefore could not be evaluated.

6. Conclusion

Benign prostatic hyperplasia was the most frequent histopathological diagnosis in TURP specimens, accounting for 87.3% of cases. However, 12.7% of patients had incidentally detected prostatic adenocarcinoma despite an initial clinical diagnosis of benign prostatic hyperplasia. The majority of both benign and malignant lesions occurred in the 60–69-year age group, and Grade Group 1 was the most common Gleason category among incidental carcinomas. Routine histopathological examination of all TURP specimens is therefore essential for the detection of clinically unsuspected malignancy, accurate tumour grading, and appropriate postoperative management. These findings reinforce the indispensable role of microscopic evaluation in guiding patient care and improving diagnostic accuracy.

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Conflict of Interest

The authors declare that there is no conflict of interest.

Author Contributions

Dr. Faud Amin Islam: Conceptualization, data collection, histopathological evaluation, data analysis, manuscript preparation.

Dr. Mandita Borgohain: Study supervision, interpretation of histopathological findings, critical revision of the manuscript, and final approval of the manuscript.

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