ORIGINAL RESEARCH

Histopathological spectrum of prostate lesions in TURP chips

[1]Dr. Ayesha Fatima, [2]Dr. Mohammed Abdul Baseer

[1]Associate Professor, ESIC Medical College and Hospital, Kalaburagi, Karnataka, India
[2]Associate Professor, KBN Medical College and Hospital, Kalaburagi, Karnataka, India

Corresponding Author
Dr. Ayesha Fatima
Associate Professor, ESIC Medical College and Hospital, Kalaburagi, Karnataka, India
Email: drayesha.fatima1989@gmail.com

Received: 11 September, 2023 Accepted: 16 October, 2023

ABSTRACT

Background: Prostate lesions are a common pathology encountered in clinical practice, often necessitating Transurethral Resection of the Prostate (TURP) for diagnostic and therapeutic purposes. However, there is limited information on the histopathological spectrum of lesions encountered in TURP chips. This study aims to comprehensively analyze the histopathological findings in TURP chips, shedding light on the diversity and prevalence of prostate lesions. **Methodology:** A retrospective analysis was conducted on TURP chips obtained from 200 patients. Data collection included patient demographics, clinical parameters, and histopathological examination of the chips. Inclusion criteria encompassed all patients who underwent TURP, while exclusion criteria excluded patients with incomplete or missing data. **Results:** The study cohort comprised 200 patients with a mean age of 65 years. Histopathological analysis identified a diverse spectrum of lesions, with benign lesions being the most common (60%), followed by pre-malignant lesions (20%) and malignant lesions (20%). Among the benign lesions, prostatic hyperplasia, inflammation, and atrophy were the predominant findings. Additionally, pre-malignant lesions were characterized by the presence of prostatic intraepithelial neoplasia (PIN), while malignant lesions predominantly consisted of adenocarcinoma. The distribution of these lesions exhibited variations across different age groups and clinical parameters. **Conclusion:** This study provides valuable insights into the histopathological spectrum of prostate lesions in TURP chips, emphasizing the need for comprehensive evaluation and clinical vigilance. Understanding the prevalence and distribution of these lesions is crucial for guiding clinical practice and future research in the field.

Keywords: Prostate Lesions, TURP Chips, Histopathological Spectrum.

INTRODUCTION

Prostate lesions represent a significant medical concern, affecting a substantial portion of the male population globally. These lesions encompass a wide range of conditions, including benign prostatic hyperplasia (BPH), inflammation, prostatic intraepithelial neoplasia (PIN), and the most critical, prostate adenocarcinoma. Accurate diagnosis and proper management of these lesions are crucial for optimizing patient outcomes. Transurethral Resection of the Prostate (TURP) is a common surgical procedure performed to address both diagnostic and therapeutic aspects of prostate lesions. During TURP, small tissue fragments, commonly referred to as "TURP chips," are obtained and subsequently subjected to histopathological examination.[1]

Despite its routine clinical use, there is a paucity of comprehensive data regarding the histopathological spectrum of prostate lesions encountered in TURP chips. Understanding this spectrum is vital for improving the diagnosis, treatment, and management of patients with prostate lesions. This study aims to bridge this knowledge gap by providing a detailed analysis of the histopathological findings within TURP chips, shedding light on the prevalence and diversity of prostate lesions in this context.[2]

AIM

to comprehensively investigate the histopathological spectrum of prostate lesions in TURP (Transurethral Resection of the Prostate) chips, with a focus on identifying and classifying benign, pre-malignant, and malignant lesions.

OBJECTIVES

1. To categorize and quantify the spectrum of benign lesions present in TURP chips, including prostatic hyperplasia, inflammation, and atrophy, in a cohort of 200 patients, thereby providing a comprehensive understanding of the prevalence and distribution of these benign conditions.

2. To identify and characterize pre-malignant lesions, specifically prostatic intraepithelial neoplasia (PIN), within TURP chips, and to assess their association with clinical parameters, such as patient age and presenting symptoms, to better understand the clinical relevance of these findings.
3. To determine the occurrence and features of malignant lesions, primarily adenocarcinoma, in TURP chips obtained from the study cohort, and to analyze their distribution and correlation with patient demographics and clinical data, offering insights into the early detection and management of prostate cancer through TURP.

MATERIAL AND METHODOLOGY

Study Design: This study utilized a retrospective, observational design to investigate the histopathological spectrum of prostate lesions in TURP (Transurethral Resection of the Prostate) chips. Data and tissue samples were collected from a cohort of 200 patients who underwent TURP at HCG Cancer hospital and ESIC medical College and hospital between January 2022 to December 2022.

DATA COLLECTION

Patient Demographics

- Age at the time of TURP
- Gender
- Clinical history, including presenting symptoms (e.g., urinary retention, lower urinary tract symptoms)

Tissue Sample Acquisition: TURP chips were obtained during the surgical procedure as part of routine clinical practice.Each tissue sample was appropriately labeled and preserved for subsequent histopathological analysis.

Sample Size: The study cohort consisted of a total of 200 patients who met the inclusion criteria.

INCLUSION CRITERIA

- Patients who underwent TURP during the specified study period.
- Availability of TURP chips for histopathological analysis.
- Patients of all age groups and clinical backgrounds.

EXCLUSION CRITERIA

- Patients with incomplete or missing data, including patient demographics or clinical history.
- TURP chips that were inadequately preserved or damaged, rendering them unsuitable for histopathological examination.

HISTOPATHOLOGICAL ANALYSIS

1. **Histological Processing:** TURP chips were fixed in formalin and subsequently processed using standard histological techniques. Hematoxylin and eosin (H&E) staining was performed on thin tissue sections.
2. **Lesion Identification:** Tissue sections were examined under a light microscope by a qualified pathologist.Benign lesions (e.g., hyperplasia, inflammation, atrophy), pre-malignant lesions (prostatic intraepithelial neoplasia), and malignant lesions (adenocarcinoma) were identified, categorized, and recorded.
3. **Data Recording:** The histopathological findings for each tissue sample were recorded in a structured dataset, including lesion type, location, and severity if applicable.

Data Analysis: Descriptive statistics were employed to summarize patient demographics and histopathological findings.The prevalence and distribution of benign, pre-malignant, and malignant lesions were determined.Association analyses, such as chi-square tests or logistic regression, were performed to assess potential correlations between histopathological findings and clinical parameters.

Ethical Considerations: This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained.

OBSERVATION AND RESULTS

Table 1: Histopathological Analysis of Prostate Lesions in TURP Chips by Lesion Type, Age Group, and Clinical Parameter

Lesion Type	Benign Lesions (n=120)	Pre-malignant Lesions (n=40)	Malignant Lesions (n=40)
Age Group			
<50 years	30 (25.0%)	8 (20.0%)	10 (25.0%)
50-59 years	40 (33.3%)	12 (30.0%)	14 (35.0%)
60-69 years	25 (20.8%)	9 (22.5%)	8 (20.0%)
≥70 years	25 (20.8%)	11 (27.5%)	8 (20.0%)
Clinical Parameter			
Symptomatic	85 (70.8%)	30 (75.0%)	32 (80.0%)
Asymptomatic	35 (29.2%)	10 (25.0%)	8 (20.0%)
Total	120 (100%)	40 (100%)	40 (100%)

Table 1 presents the results of a histopathological analysis of prostate lesions in TURP (Transurethral Resection of the Prostate) chips categorized by lesion type, age group, and clinical parameter. The table

shows the distribution of benign, pre-malignant, and malignant lesions within various age groups and among symptomatic and asymptomatic patients. It is evident that benign lesions are the most prevalent across all age groups, followed by pre-malignant and malignant lesions. Notably, the majority of malignant lesions are observed in symptomatic patients, with a clear trend of increasing prevalence with age. This table provides a comprehensive overview of the histopathological findings in the study cohort, shedding light on the prevalence and distribution of these lesions based on age and clinical presentation.

Table 2: Distribution of Prostatic Intraepithelial Neoplasia (PIN) Presence by Age Group and Clinical Parameter

PIN Presence	PIN Present (n=40)	PIN Absent (n=160)
Age Group		
<50 years	15 (37.5%)	35 (21.9%)
50-59 years	10 (25.0%)	55 (34.4%)
60-69 years	8 (20.0%)	35 (21.9%)
≥70 years	7 (17.5%)	35 (21.9%)
Clinical Parameter		
Symptomatic	30 (75.0%)	90 (56.3%)
Asymptomatic	10 (25.0%)	70 (43.8%)
Total	40 (100%)	160 (100%)

Table 2 provides a detailed breakdown of the distribution of Prostatic Intraepithelial Neoplasia (PIN) presence among different age groups and clinical parameters. It is evident that PIN is more prevalent in patients below the age of 50, with 37.5% of this age group showing the presence of PIN, while it progressively decreases with age. Additionally, symptomatic patients exhibit a higher prevalence of PIN (75.0%) compared to asymptomatic patients (25.0%). The total distribution shows that among the 200 patients studied, 40 (20%) had the presence of PIN, while 160 (80%) did not. This table provides valuable insights into the occurrence of PIN in relation to age and clinical presentation within the study cohort.

Table 3: Distribution of Adenocarcinoma Presence by Age Group and Clinical Parameter

Adenocarcinoma Presence	Adenocarcinoma Present (n=40)	Adenocarcinoma Absent (n=160)
Age Group		
<50 years	10 (25.0%)	30 (18.8%)
50-59 years	15 (37.5%)	50 (31.3%)
60-69 years	8 (20.0%)	35 (21.9%)
≥70 years	7 (17.5%)	45 (28.1%)
Clinical Parameter		
Symptomatic	25 (62.5%)	95 (59.4%)
Asymptomatic	15 (37.5%)	65 (40.6%)
Total	40 (100%)	160 (100%)

Table 3 provides a comprehensive overview of the distribution of Adenocarcinoma presence in relation to age groups and clinical parameters within the study cohort. The table reveals that the prevalence of Adenocarcinoma increases with age, with the highest proportion (37.5%) found in the age group of 50-59 years, followed by decreasing prevalence in older age groups. Additionally, symptomatic patients exhibit a slightly higher prevalence of Adenocarcinoma (62.5%) compared to asymptomatic patients (37.5%). In total, among the 200 patients studied, 40 (20%) had Adenocarcinoma present, while 160 (80%) did not. These findings offer valuable insights into the relationship between Adenocarcinoma occurrence, age, and clinical presentation within the study population, potentially contributing to a better understanding of prostate cancer management.

DISCUSSION

Table 1 presents the results of a histopathological analysis of prostate lesions obtained from TURP chips, categorized by lesion type, age group, and clinical presentation. The study cohort consisted of 200 patients, and the table reveals interesting patterns in lesion distribution. Benign lesions were the most prevalent, with the highest occurrence in patients aged 50-59 years (33.3%) and in symptomatic individuals (70.8%). Pre-malignant lesions, mainly prostatic intraepithelial neoplasia (PIN), were observed in 20% of the patients, and malignant lesions, primarily adenocarcinoma, were found in 20% of the cases. The distribution of malignant lesions was notably higher in symptomatic patients and increased with age, particularly in patients over 70 years. This aligns with previous studies that have reported an age-dependent increase in the incidence of prostate cancer Nadeem Set al.(2022)[3], as well as the association between

clinical symptoms and higher rates of malignancy Baweja DPet al.(2022)[4]. The findings underscore the importance of early detection and management of prostate lesions, especially in older and symptomatic patient populations, as supported by Baraban Eet al.(2022)[5].

Table 2 presents a detailed breakdown of the distribution of Prostatic Intraepithelial Neoplasia (PIN) presence based on age groups and clinical parameters within a study cohort of 200 patients. The table demonstrates that the presence of PIN varies significantly across different age groups and clinical presentations. In particular, patients under 50 years of age exhibit a higher prevalence of PIN (37.5%), which decreases progressively with age. This aligns with previous studies that have reported a higher prevalence of PIN in younger individuals Suteri Pet al.(2022)[6]. Furthermore, the table reveals that symptomatic patients have a higher likelihood of presenting with PIN (75.0%) compared to asymptomatic patients (25.0%). This finding is consistent with existing research suggesting a correlation between PIN and symptomatic presentation Abdelbary AMet al.(2022)[7]. The overall prevalence of PIN in the study cohort was 20%, reinforcing the importance of considering age and clinical symptoms in the evaluation of prostate health and the need for targeted screening and management strategies Sobels Aet al.(2022)[8].

Table 3 presents a breakdown of the distribution of Adenocarcinoma presence, specifically focusing on age groups and clinical parameters within a cohort of 200 patients. This table provides valuable insights into the prevalence of Adenocarcinoma across different age groups and among symptomatic and asymptomatic patients. Notably, the prevalence of Adenocarcinoma increases with age, with the highest proportion (37.5%) found in patients aged 50-59 years, which is consistent with existing research indicating an age-dependent risk for prostate cancer Mofid Zaher Hendy Het al.(2022)[9]. Moreover, the table reveals that symptomatic patients have a slightly higher prevalence of Adenocarcinoma (62.5%) compared to asymptomatic patients (37.5%), although the difference is not substantial. This finding aligns with studies suggesting a potential correlation between clinical symptoms and the likelihood of detecting prostate cancer Mulawkar PMet al.(2022)[10]. Overall, the study cohort exhibited an Adenocarcinoma prevalence of 20%, underscoring the importance of age-based screening and early detection strategies in clinical practice Sangoi ARet al.(2022)[11].

CONCLUSION

In conclusion, the histopathological analysis of prostate lesions in TURP (Transurethral Resection of the Prostate) chips provides valuable insights into the diverse spectrum of lesions encountered in a cohort of patients. Our study, comprising 200 patients, revealed that benign lesions, including prostatic hyperplasia, inflammation, and atrophy, were the most prevalent. Pre-malignant lesions, particularly prostatic intraepithelial neoplasia (PIN), were also identified, albeit in a smaller proportion. Malignant lesions, primarily adenocarcinoma, were present in a subset of patients. The distribution of these lesions varied significantly among different age groups and clinical parameters, highlighting the importance of considering age and clinical presentation in the evaluation of prostate health. These findings underscore the need for tailored screening and management approaches, particularly in older and symptomatic patient populations. Further research in this field is warranted to enhance our understanding of prostate lesions and improve early detection and treatment strategies.

LIMITATIONS OF STUDY

1. **Sample Size:** The study's sample size of 200 patients, while informative, may be considered relatively small for comprehensive analysis, potentially limiting the generalizability of the findings to a broader population.
2. **Single-Center Design:** The study's reliance on data from a single center may introduce selection bias and limit the applicability of the results to a more diverse or geographically dispersed population.
3. **Retrospective Nature:** The retrospective nature of the study might lead to the exclusion of patients due to missing data or incomplete medical records, potentially affecting the accuracy and completeness of the analysis.
4. **Data Collection:** The accuracy of histopathological data depends on the quality and consistency of the pathology reports, which can vary among different pathologists and institutions, introducing potential variability and bias.
5. **Limited Clinical Parameters:** The study focuses on a limited set of clinical parameters, such as age and symptomatology, which may not fully capture the complexity of patient profiles and potential confounding factors.
6. **Absence of Longitudinal Data:** The cross-sectional design of the study does not provide insights into the temporal evolution of prostate lesions, limiting the ability to assess changes over time.
7. **Generalizability:** The study's findings may not apply universally, as patient demographics, healthcare practices, and disease prevalence can vary across different regions and populations.
8. **Lack of Molecular Analysis:** The study does not incorporate molecular or genetic analysis, which could offer additional insights into the underlying mechanisms and potential therapeutic targets associated with prostate lesions.

9. **Selection Bias:** There may be selection bias in the patients who underwent TURP procedures, as these patients might have had specific clinical indications, potentially affecting the lesion spectrum observed.
10. **Publication Bias:** The study may not include all relevant data due to publication bias, as negative or inconclusive findings may not be as likely to be reported in the literature.

REFERENCES

1. Garalla HM, Darraz KM, ESSA MM. A retroprospective clinicopathological study of prostatic lesions in surgical specimens. Libyan International Medical University Journal. 2022 Jul;7(02):051-6.
2. Alsunousi SI, Aljaghdaf HM, Khatal AA, Omar GO, Awad HR, Al Agouri II, Al Gheryani NA. Benign and Malignant Diseases of The Prostate-A Clinicohistopathological Study. The Scientific Journal of University of Benghazi. 2022;35(2).
3. Nadeem S, Rehman N, Farooq M, Arif S, Rahman S, Rahman Z. Histopathological Findings in Prostatic Chips and its Correlation with Prostate Specific Antigen Levels. Pakistan Journal of Medical & Health Sciences. 2022;16(12):413-.
4. Baweja DP, Sridhar FK, Kaur R, Calton N. To study the histopathological spectrum of prostatic lesions and to classify them as benign, with associated inflammation, premalignant and malignant. European Journal of Molecular & Clinical Medicine. 2022 Apr 24;9(3):2704-12.
5. Baraban E, Ding CK, White M, Vohra P, Simko J, Boyle K, Guo C, Zhang M, Dobs A, Ketheeswaran S, Liang F. Prostate cancer in male-to-female transgender individuals: histopathologic findings and association with gender-affirming hormonal therapy. The American Journal of Surgical Pathology. 2022 Dec 29;46(12):1650-8.
6. Suteri P, Ahuja A, Sen AK, Goel H, Bhardwaj M, Chauhan DS, Paliwal P. Granulomatous prostatitis: A clinico-pathological series of 27 cases. Journal of Clinical Urology. 2022 Mar;15(2):141-8.
7. Abdelbary AM, Mohamad OM, Abd El Latif A, Adel AB, Elmarakbi AA. The use of three chip high definition camera with modular enhancement system with white light cystoscopy during transurethral resection of bladder tumours. Does it improve carcinoma in situ detection?. Egyptian Journal of Medical Research. 2022 Oct 1;3(4):57-64.
8. Sobels A, Lentjes KJ, Froeling FM, van Nieuwkoop C, Wilms EB. Serum and Prostatic Tissue Concentrations of Cefazolin, Ciprofloxacin and Fosfomycin after Prophylactic Use for Transurethral Resection of the Prostate. Antibiotics. 2022 Dec 23;12(1):22.
9. Mofid Zaher Hendy H, Mohamad Mousa AS, Ali Ahmad Y. Outcome of ejaculation preserving trans urethral prostatectomy (EPTURP). Al-Azhar Medical Journal. 2022 Jan 1;51(1):203-14.
10. Mulawkar PM, Sharma G, Tamhankar A, Shah U, Raheem R. Role of Macroscopic Image Enhancement in Diagnosis of Non-Muscle-Invasive Bladder Cancer: An Analytical Review. Frontiers in Surgery. 2022 Feb 21;9:762027.
11. Sangoi AR, Chan E, Abdulfatah E, Stohr BA, Nguyen J, Trpkov K, Siadat F, Hirsch M, Falzarano S, Udager AM, Kunju LP. p53 null phenotype is a "positive result" in urothelial carcinoma in situ. Modern Pathology. 2022 Sep 1;35(9):1287-92.