Original Article

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Histopathological Spectrum and Staging of Urinary Bladder Tumors at a Peripheral Tertiary Care Center in Lahore

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Abstract

Objective: To determine the histopathological spectrum of urinary bladder tumors in TURBT and cystectomy specimens in a peripherally located tertiary care hospital in Lahore.

Methodology: A retrospective study was carried out at the pathology department of a peripheral tertiary care center of Lahore over a period of 2019 to 2024 approved by ethical review board. A total of 31 urinary bladder specimens were evaluated by histopathology team. A meticulous gross and microscopic examination was done. Paraffin-embedded tissue blocks were prepared and stained with eosin and hematoxylin. Clinico-histopathological features of neoplastic lesions were categorized and reported according to WHO classification system (2022).

Results: A total of 31 cases were included, of which the majority were TURBT specimens (95.7%). The most common neoplastic lesion was high-grade invasive urothelial carcinoma (54.7%), while the papillary variant was noted in 38.7% of cases. The most of them were pT2 tumors (38.7%).

Conclusion: Our study showed that TURBT specimens of males had high-grade urothelial carcinomas. These conclusions highlight the significance of urinary bladder specimen evaluation for effective patient management.

Keywords: Urothelial Carcinoma, Cystoscopy, Transurethral resection of bladder tumor

Introduction

Urinary bladder lesions are a common problem among both genders, and these lesions vary from harmless benign lesions to potentially dangerous and life-threatening tumors.[1] Urothelial cancers are the sixth most common cancers, constituting 3% of new cases globally, and eleventh in incidence per year.[1-2] Most patients are in the 50-80 years of age group and male-female ratio is 3.4:1.[1-5] The patients usually present with gross hematuria, difficulty in micturition, and lower abdominal pain.[6] The various studied risk factors include cigarette smoking, chemical carcinogens from industrial exposure, schistosomiasis in endemic areas, drugs i.e., cyclophosphamide and positive family history.[5,6]

There are various diagnostic modalities for identifying urinary bladder cancers among which cystoscopy is the primary diagnostic tool for direct visualization of bladder neoplasms.[7] The clinical prognosis depends on their histologic type, histologic grade, and pathological staging particularly the presence or absence of muscle invasion. About 75-80% of cases are non-muscle invasive bladder cancer.[8-10] At the time of diagnosis, about 25% of bladder cancers are muscle invasive, while 5% are locally advanced. The muscle-invasive tumors are associated with poor prognosis.[3] Papillary urothelial carcinoma is the commonest histological type accounting for 90% of all primary bladder tumors further subtyped as papillary urothelial neoplasms of low malignant potential (PUNLMP) papillary urothelial neoplasms, low grade (PUNLG) and Papillary urothelial neoplasms, high grade (PUNHG).[11-14] Other rare tumors in bladder include hemangioma, adenocarcinoma, sarcomas, small-cell carcinoma, and plasmacytoma.[10-15]

In the present study, we aim to narrate the histopathological spectrum of bladder tumors who underwent TURBT at a peripheral tertiary care center in Lahore. The clinical management of patients entirely depends upon the histopathological report.

Methodology

A retrospective descriptive study was carried out in a peripheral tertiary care center of Lahore over a period of 2017 to 2024. All diagnosed cases of neoplastic urinary bladder tumors in TURBT and cystectomy specimens were included. Inadequate or poorly preserved specimens, non-neoplastic bladder lesions, recurrent tumors with previously established histological diagnosis, and cases with incomplete clinical or demographic data were excluded. After a thorough gross examination, slides were prepared and stained with hematoxylin and eosin. All the demographic data i.e. age, gender, and clinical features were recorded. Histological categorization of the tumor was done according to WHO (2004) /ISUP classification and staging done as per College of American Pathologist (CAP) protocol.

Results

A total of 31 cases studied showed predominantly TURBT specimens 96.7%. Most patients were male (90.3%) and above 50 years of age, as shown in Table I. Most commonly observed tumor was invasive papillary urothelial carcinoma, high grade 38.7%. The least observed was noninvasive urothelial carcinoma, low grade 6.5%. The rest of the variants are deciphered in detail in Table II. Pathological staging revealed pT2 disease as the most frequent stage (38.7%), as shown in Table II.

Discussion

Urinary bladder tumors are the 8th most common malignancy reported worldwide.[1-4] In the present study, a thorough comparison of demographic features and histopathological findings between national and international studies is done. The demographic data i.e.; variations in age distribution, clinical presentations, and gender ratios of the index study are aligned with

Table 1. Main demographic data of patients presented with neoplastic urinary bladder lesions

1. Mean age	58.6years± 11.2 years
2. Age groups in years	
Below 50	7 (22.6%)
Above 50	24 (77.4%)
3. Age range	
Minimum age	32 years
Maximum age	83 years
4. Gender	
Males	28 (90.3%)
Females	3(9.7%)

Table 2. Clinicopathological Characteristics of Urinary Bladder Tumors

1. Clinical presentations	No. (Percentage)
1. Hematuria	29(95%)
2. Other lower urinary tract symptoms	7 (22.6%)
Dysuria, Urgency and Frequency	2(5%)
2. Type of Specimen received	
1. No. TURBT specimen	30(96.7%)
2. Cystectomy specimen	1(3.2%)
3. Histopathological diagnosis	
1. Papillary Urothelial Neoplasia of Low Malignant Potential (PUNLMP)	6(19.4%)
2. Noninvasive Urothelial Carcinoma, Low Grade,/NUCLG	2(6.5%)
3. Invasive Papillary Urothelial Carcinoma, Low Grade/ IPUCLG	6(19.4%)
4. Invasive Papillary Urothelial Carcinoma, High Grade/ IPUCHG	12(38.7%)
5. Lymphoepithelioma like variant	1(3.2%)
6. Plasmacytoid variant	1(3.2%)
7. Sarcomatoid variant	1(3.2 %)
8. Squamous differentiation variant	1(3.2%)
9. Poorly differentiated variant	1(3.2%)
	17(54.7%)
4. Lymphovascular Invasion	
1. Present	10(32.3%)
2. Not Identified	21(67.7%)
5. Stage of Tumor	
1. pTa	7(35.5%)
2. pT1	7(22.6%)
3. pT2	12(38.7%)
4. pT4	1(3.2%)

**No pT3 tumor was identified.*

the authors.(15) Our study showed a mean age of 59.5 years, and the age range was 28-88 years, consistent with findings reported by Islam MA et al.16, Sharma DD et al.17, Kaur KP et al.18, and Saeed S et al. 19 In contrast, Saouli Aet al.20 and Awad HR et al.21 reported a higher mean age of 62 and 64.5 years respectively. The reported clinical features such as hematuria and dysuria are also consistent with Pudasaini S et al.15, Islam MA et al.16, and Poker R et al.22 Male predominance was a consistent finding across various studies, as reported by Poudel S et al.15, Islam MA et al.16, Pokar R et al.22, Sharma DD et al.18, Saeed S et al.19, Tadvi RS et al.23, Yoo S et al.24 and Zhang Y et al. 4 Our study showed 91.3% of neoplastic bladder lesions noted in the 5th decade of life, aligned with Awad HR et al.20 However, Poudel S et al.15reported 7th decade and Kaur KP et al.18 reported 6th decade. (Table 1) We received the majority of TURBT specimens and one cystectomy specimen, similarly reported by Pokar R et al.22 (Table 2)

The prevalence of different bladder cancer subtypes across studies showed wide variations of histological subtypes, however, the most commonly found tumors were papillary urothelial tumors. In the index study, IPUCHG (figure 1, 1C) was 54.7% similarly Sharma DD et al.17 reported 65.3% and Farnaz T et al.25 reported

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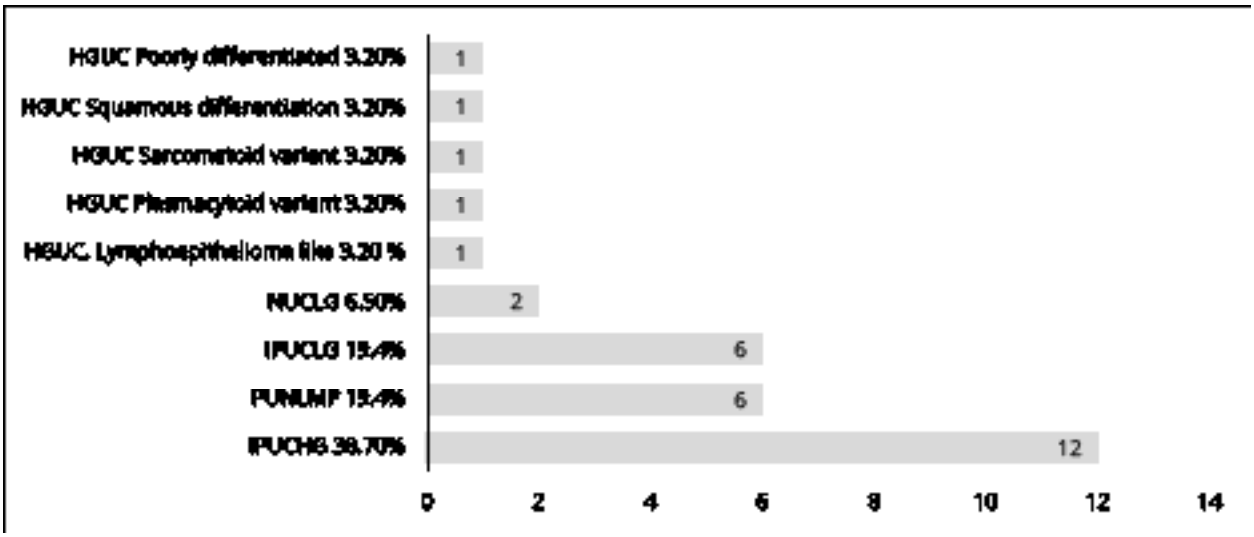
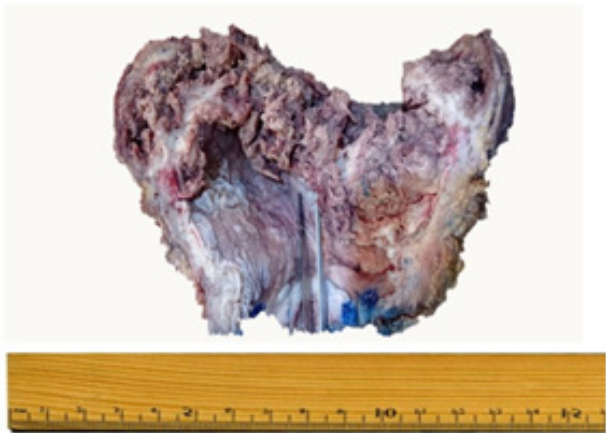


Figure 1: Different variants of urothelial carcinoma

Fig 2A



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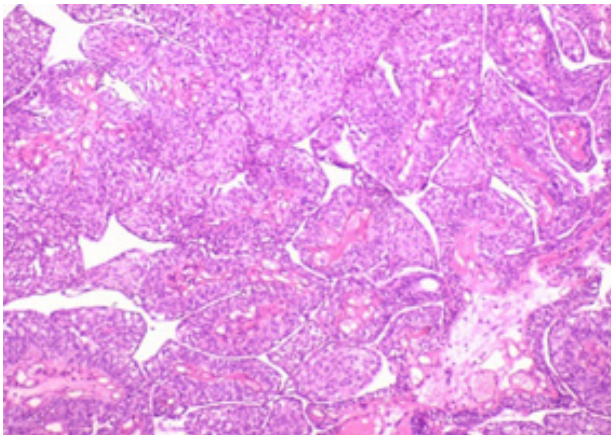

Fig 2C

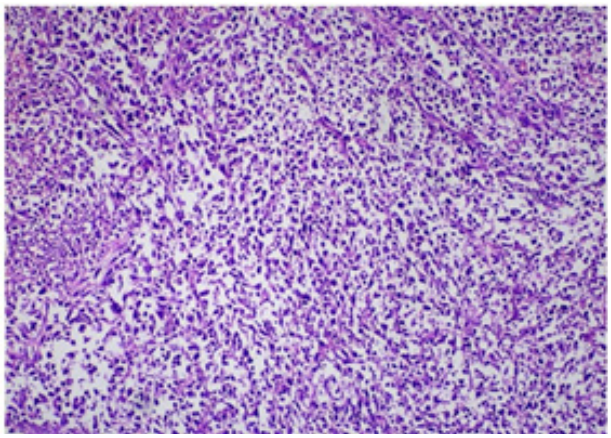

Fig 2D

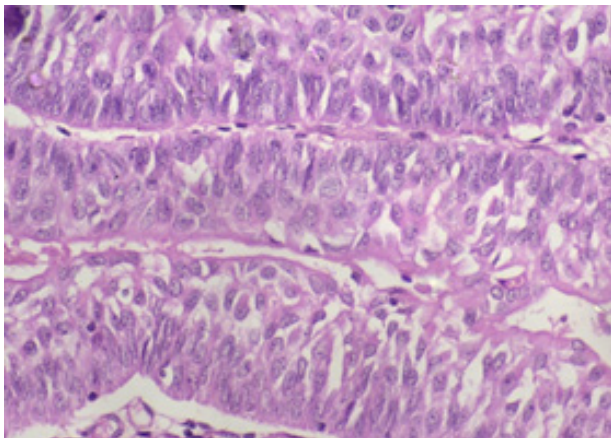

Figure 2A: Grossly, a total cystectomy specimen showed a whole papillary tumor covering the entire walls of the bladder. Figure 2B: H and E stained section shows squamoid differentiation, disorganized cell layer, high nuclear atypia, and abundant eosinophilic cytoplasm. Figure 2C: Low power view of a variant of sarcomatoid carcinoma of urothelial type. The neoplastic cells are poorly cohesive type. Figure 2D: Papillary urothelial carcinoma shows fusion of papillae.

Fig 3A

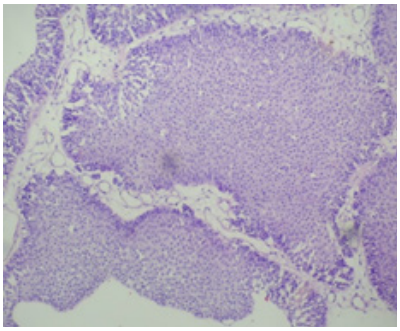

Fig 3B

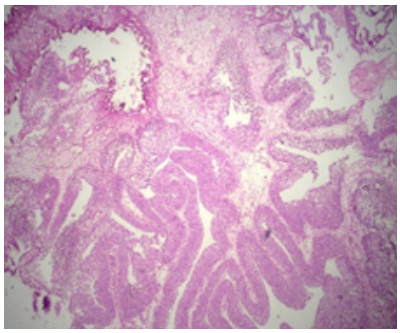

Fig 3C

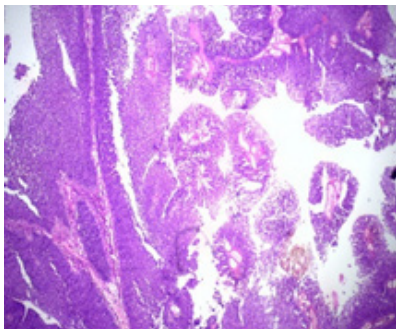

Fig 3D

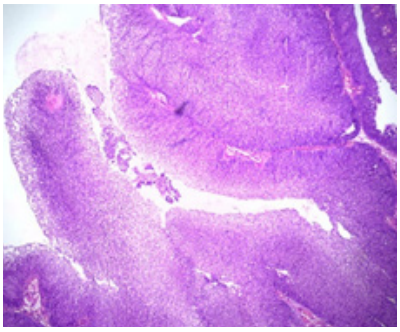

Fig 3E

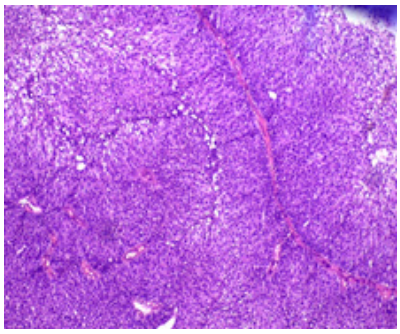

Fig 3F

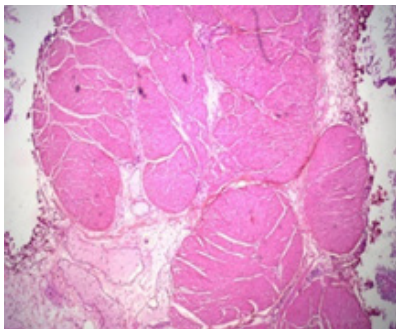

Figure 3A: Low power view of H and E stained section shows PUNLMP. The neoplastic cells are cohesive type (pTa). Figure 3B: Low power view of H and E stained section shows mild fusion of papillae, slightly disorganized cell layer. The neoplastic cells show mild nuclear atypia and eosinophilic cytoplasm. Invasion into stroma noted (pT1). Figure 3C: Non-invasive Papillary urothelial carcinoma, low grade shows fusion of papillae. Figure 3D: Invasive Papillary urothelial carcinoma, high grade shows massive fusion and markedly increased thickness of papillae. Figure 4E: High power view of H and E stained section Invasive Papillary urothelial carcinoma, high grade shows fusion of papillae. Figure 4F: High power view of H and E section shows muscle bundles, free of tumor.

58.8%. However, Shruthi HP et al.26 reported 94.7%, and Ertoy-Baydar D et al.27 reported 93.3% of these tumors. In contrast Poudel S et al.15 reported 48.72%, Awad HR et al.20 reported 30.91% and Tadvi RS et al.23 reported 29.06% respectively as compared to index study. (Table 2). Our index study showed 6 cases of PUNLMP, Tadvi RS et al.23 reported 7 cases however, Poudel S et al.15 Pokar R et al.22 only 1 case of PUNLMP.

In the index study, 6.5% of low grade invasive urothelial carcinoma were noted, In contrast, Kumar M et al.4 reported 42.85%. The staging of tumors also varied, with differences noted in the distribution of non-invasive and invasive lesions across studies, highlighting discrepancies. In the study, Non-invasive pTa tumors were 35.5%. In contrast, Tadvi RS et al.23 reported 26.73% respectively. Awad R et al.20reported only 2.56%. The index study showed 22.6% of pT1 tumors, however, Sharma DDet al.17 reported 17.9% and Awad HR et al.20 reported 43.5%. In the index study, pT2 tumors were 38.7% and Jubber I et al.1 reported 30%, Dhatwalia A et al.28 reported 39.1% and Farnaz T et al.25 and Saeed S et al. 19 reported slightly higher 51% and 50.6% respectively. The remaining authors i.e., Islam MA et al.16 Pokar R et al.22, and Sharma DD et al.17 reported 75.75%, 74.19%, and 77.9%. In contrast, Tadvi RS et al.23 reported only 46.51% of invasive tumors. In the current study, the pT4 tumor was 3.2% similar to Awad HR et al.202.56%.

Ertoy-Baydar D et al. 27 reported 25% of other variants. Sharma DD et al.17 and Saeed S et al.19 also reported rare histological subtypes i.e., Squamous Cell carcinoma and Sarcomatoid carcinoma similar to the index author. However, Saouli A et al.21reported squamous and micropapillary differentiation as the commonly reported variants. Sharma DD et al.17 also reported 0.5% and Saeed S et al.19 reported 3.8% and Tadvi RS et al.23 of 5.81% of Adenocarcinoma of urinary bladder tumors, which was not seen in index case.We have excluded non-neoplastic bladder lesions in our study, however, Tadvi RS et al.23 and Shruthi HP et al.26 reported additional pathological findings of urothelial dysplasia, urothelial papilloma, and inverted urothelial papilloma.

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Conclusion

The present study demonstrated that urinary bladder tumors predominantly affected males above 50 years of age, with most cases diagnosed in TURBT specimens. High-grade invasive urothelial carcinoma was the most frequently observed histopathological subtype, and pT2 was the most common pathological stage.

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Authors' Contribution Statement

FS contributed to the conception, design, acquisition, analysis, interpretation of data, drafting of the manuscript, critical review of the manuscript, and final approval of the version to be published. SI contributed to the analysis, interpretation of data, drafting of the manuscript, and critical review of the manuscript. MA contributed to the analysis, interpretation of data, drafting of the manuscript, and critical review of the manuscript. SMC contributed to the analysis, interpretation of data, and drafting of the manuscript. MN contributed to the analysis, interpretation of data, and drafting of the manuscript. SI contributed to the acquisition, analysis, and interpretation of data. AH contributed to the acquisition, analysis, and interpretation of data. MJC contributed to the acquisition, analysis, and interpretation of data. All authors are accountable for their work and ensure the accuracy and integrity of the study.

Conflict of Interest

Authors declared no conflict of interest

Grant Support and Financial Disclosure

None

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.