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Original Research Article

Spectrum of histopathological variants in urinary bladder carcinoma- Experience in a tertiary care hospital

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ABSTRACT

Background: Urinary bladder neoplasm are associated with significant mortality and morbidity throughout the world. It is 9^{th} most common cancer worldwide. The clinical significance of bladder tumor depends on their histological grade, differentiation and depth of invasion of the lesions.
Aim: To study histopathological spectrum of urinary bladder neoplasm and to asses this lesion with regard of age, sex and correlation of muscle invasion with tumor grade.
Materials and Methods: Total 58 biopsy (53 TURBT and 5 Radical cystectomy specimen) were studied retrospectively over a period of August 2020 to July 2022 in the department of pathology, GMCH, Udaipur. These lesions were classified according to WHO classification 2016.
Result: The male to female ratio was 7.2:1 and age ranged from 41 to 85 years. Most common presenting symptoms was hematuria (91.37%). Most common lesion were infiltering urothelial carcinoma (36 cases) comprising of 33(91.66%) cases of high grade and 3 (8.33%) cases of low grade malignancy. Out of 33 High grade-infiltering urothelial carcinoma cases 25(75.75%) cases show muscle invasion. 19 cases were noninvasive urothelial lesions, 1 case was squamous cell carcinoma.
Conclusion: Urothelial carcinoma (TCC) is the most common primary bladder carcinoma. Male are affected more common than Female. Peak incidence is seen in sixth decade of life. High grade tumor is common associated with muscle invasion.

1. Introduction

Urinary bladder neoplasms are associated with significant mortality and morbidity throughout the world. It is 9^{th} most common cancer worldwide.[1] Bladder neoplasm account for 6% and 2% of the cancer incidence in men and women respectively. Urothelial carcinoma is the commonest type accounting for 90% of all primary tumors of the bladder.[2] Urinary bladder cancer is a complex and heterogeneous disease with a broad spectrum of histological findings. Despite advances in surgical techniques as well as intravesical and systemic therapies, patients with muscle invasive carcinoma experience disease progression, recurrence and death.[3] The clinical significance of bladder tumor depends on their histological grade, differentiation and depth of invasion of the lesions.[4]

2. Aims and Objectives

1. To study various histopathological spectrum of urinary bladder neoplasms
2. To assess this histopathological spectrum of urinary bladder neoplasms with regard of age, sex, clinical features and correlation of muscle invasion with tumor grade.

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3. Materials and Methods

A retrospective study was carried out in pathology department of Geetanjali medical college and hospital, Udaipur over period of March 2020 to August 2022. All urinary bladder biopsies received in department were evaluated. Histopathological confirmed diagnosed case urinary bladder neoplasms were included in this study. Total 58 biopsies were included in the present study. Gross examination was done, the tissues were processed for paraffin blocking. Sections of 3 mm were cut and are stained with haematoxylin and eosin. The histological features were studied and relevant findings were noted.

3.1. Inclusion criteria

All cystoscopic and TURBT (Transurethral resection of bladder tumor) biopsies taken from the urinary bladder and received in Department of Pathology, Geetanjali medical college and hospital, Udaipur. Were considered for the study.

3.2. Exclusion criteria

Inadequate bladder biopsy or poor preservation during its transfer to the pathology department.

4. Results

Total 58 cases studied in which 51 were male and 7 were female (M: F = 7.2:1). Age of cases ranged from 41 to 85 years. [Table 1]

Table 1: Age and sex distribution of urothelial tumors

Age group	Males	%	Females	%	Total	%
41-50	6	10.3%	2	3.4%	8	13.8%
51-60	17	29.3%	2	3.4%	19	32.8%
61-70	15	25.8%	0	-	15	25.9%
71-80	10	17.2%	3	5.2%	13	22.4%
>81	3	5.2%	0	-	3	5.2%

Presenting symptoms were painless hematuria (91.4%) followed by increased frequency of micturition (32.8%), burning micturition (31%), dysuria (8.6%) and abdominal pain (6.9%) and LUTS (3.5%). [Table 2]

Table 2: Clinical features of urothelial carcinoma

Symptoms	No. of cases	%
Hematuria	53	91.4%
Burning micturition	18	31%
Dysuria	5	8.6%
Increase frequency of micturarion	19	32.8%
Abdominal pain	4	6.9%
LUTS	2	3.5%

19 non-invasive urothelial lesions include non-invasive papillary urothelial carcinoma (16 cases), carcinoma in-situ (1 case), Papillary urothelial neoplasm of low malignant potential (PUNLM) (1 case) and urothelial proliferation of uncertain malignant potential (1 case). [Table 3]

Table 3: Distribution of non-invasive urothelial carcinoma

Non- invasive urothelial carcinoma	No. of cases	%
Non-invasive papillary urothelial carcinoma	16	27.6%
Carcinoma in-situ	1	1.7%
Papillary urothelial neoplasm of low malignant potential (PUNLM)	1	1.7%
Urothelial proliferation of uncertain malignant potential	1	1.7%

Most common lesion were infiltrating urothelial carcinoma (36 cases) comprising of 33 (91.66%) cases of high grade and 3 (8.33%) cases of low-grade malignancy. There was 1 case of squamous cell carcinoma, 1 case of undifferentiated urothelial carcinoma and 1 case of Metastasis (Prostatic adenocarcinoma). In this study differentiation present in 3 cases in which 2 cases showed squamous differentiation and 1 case showed glandular differentiation. [Table 4]

Table 4: Distribution of invasive urothelial carcinoma

Invasive urothelial carcinoma	No. of cases	%
High-grade urothelial carcinoma	33	91.66%
Low-grade urothelial carcinoma	3	8.33%

The detrusor muscle was absent in 2 biopsies. Hence, muscle invasion could be assessed in 34 cases. [Table 5]

Table 5: Presence of muscle invasion in infiltrating urothelial carcinoma

Infiltrating urothelial carcinoma (34 cases)			
	Muscle invasion		
Grade	Present	Absent	Total
Low-grade	01(33.34%)	02(66.66%)	03
High-grade	23(74.19%)	08(25.81%)	33
Total	24	10	34

5. Discussion

Bladder cancer ranks ninth most common cancer worldwide. Urothelial carcinoma is the commonest type accounting for 90% of all primary tumors of the bladder. Cystoscopy allows direct visualization of bladder mucosa and is the primary diagnostic modality for diagnosis of bladder lesions.[5] Bladder tumor diagnosis and staging done by combination of cystoscopy and histopathology assessment.[6]

Total 58 cases studied in which 51 were male and 7 were female (M: F = 7.2:1). Rajesh et al and Anupama et al had similar study in which M: F ratio was 1.5:1 and 3:1.[5,7] In this study, peak age incidence of cases in 6^{th} decade followed by 7^{th} decade. Commonest age group were affected by neoplastic lesion were age group of 61-70 years that was reported by Rajesh et al,[7] Gupta et al,[5] Goyal et al,[8] Vidya et al[9] and Matalka et al.[10]

In present study, presenting symptoms were painless hematuria (91.4%) followed by increased frequency of micturition (32.8%), burning micturition (31%), dysuria (8.6%) and abdominal pain (6.9%). Agarwal et al[11] reported that commonest clinical presentation was hematuria followed by abdominal pain (54%), increase frequency (46%), dysuria (40%), urgency (38%) and incomplete voiding (22%). Gupta et al[12] had found that commonest clinical presentation was hematuria.

Urothelial carcinoma was most common malignant lesion (93.10%) which was correlate with the study of Goyal et al[8] (96.87%)and Sharma et al[13] (91.9%) and Jhaveri et al[3] (89%).

In present study, 19 non-invasive urothelial lesions include non-invasive papillary urothelial carcinoma (16 cases), carcinoma in-situ (1 case), Papillary urothelial neoplasm of low malignant potential (PUNLM) (1 case) and urothelial proliferation of uncertain malignant potential (1 case). Most common lesion were infiltrating urothelial carcinoma (36 cases) comprising of 33 (91.66%) cases of high grade and 3 (8.33%) cases of low-grade malignancy. There was 1 case of squamous cell carcinoma, 1 case of undifferentiated urothelial carcinoma and 1 case of Metastasis (Prostatic adenocarcinoma). Pathologic grade and muscle invasion in urothelial carcinoma are the most important prognostic factor. Blaveri et al evaluated the association between genomic instability and muscle invasive tumors, and found that muscle invasive tumors associate with worse outcome.[14] In present study, 36 cases of invasive urothelial carcinoma in which 3 cases were low grade and 33 cases were high grade. Detrusor muscle was absent in 2 biopsies. Hence, 34 cases were evaluated for muscle invasion 1 case (33.34%) of low grade and 33(74.19%) cases of high grade showed muscle invasion which was nearly correlate with Jhaveri et al.[3] Mylsamy et al[15] concluded that Out of 38 cases, only in 18 cases muscle invasion been examined that is 6 cases in low grade and 12 cases in high grade were reported. Invasion to the muscle layer correlates with the high grade tumor. Jhaveri et al[3] studied that 21 cases of muscle invasion was seen in 14% cases of low grade and 62% cases of high grade urothelial carcinoma. Similar observation was also made by Laishram et al[16] and by Vaidya et al.[9] It is important to include smooth muscle in biopsy to prevent under staging of tumors.

6. Conclusion

Urothelial carcinoma was the most common lesion observed in cystoscopic biopsies and cystectomy specimens. Early diagnosis is more important in diagnosing bladder cancer. Grading and staging are two factors that help in the prognosis and treatment options of patients with bladder carcinoma.[3] Males are more commonly affected than females. Hematuria is most common clinical presentation in patients with urinary bladder tumors. Majority of patients were in the age group of 50 to 60 years. A large percentage of high-grade urothelial carcinomas presented with muscle invasion. There is a clear correlation between muscle invasion and tumor progression. Inclusion of muscle layer in the cystoscopic biopsy helps in accurate diagnosis and staging of tumor.

7. Source of Funding

None.

8. Conflicts of Interest

There is no conflict of interest.

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