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ORIGINAL RESEARCH

Evaluating the histopathological spectrum of urinary bladder lesions with a focus on neoplastic lesions

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ABSTRACT

Background: Nonneoplastic and neoplastic lesions are commonly seen in the urinary bladder with varying signs and symptoms with neoplastic being common. The majority of lesions are epithelial and urothelial in origin. Aim: To assess the histopathological spectrum of urinary bladder lesions focusing on neoplastic lesions. **Methods:** The study assessed urinary bladder samples received at the Gajaraja Medical College, Gwalior, Madhya Pradeshwithin the defined study period assessed gross and processed completely following standard procedure. Various 3–5-micron sections were procured, stained, and assessed in the light microscope to evaluate various neoplastic and non-neoplastic lesions. **Results:** A total of 130 cases were assessed with 70 TURBT specimens and 60 cystoscopic biopsies from 38.46% (n=50) females and 61.54% (n=80) males. In non-neoplastic lesions, chronic non-specific cystitis was common and in neoplastic lesions, invasive urothelial carcinoma showed predominance in 62.86% (n=44) cases. Neoplastic lesions were more common in males with 74.28% of cases. **Conclusion:** Urinary bladder tumors are most commonly seen by pathologists and are heterogeneous. Both malignant and benign lesions have been reported with malignant lesions being common with male predilection and in elderly subjects that are smokers. Identification of invasion extent with microscopy is a vital aspect of urothelial carcinomas. **Keywords:** histopathology, urinary bladder, neoplasm, urothelial carcinoma

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INTRODUCTION

Urinary bladder lesions are vital findings with both neoplastic and non-neoplastic lesions being common and a high incidence of malignant lesions. Common neoplastic lesions seen are tuberculosis, urachal lesions, malakoplakia, and cystitis where cystitis is the most common acute/chronic inflammatory lesion of the urinary bladder. Neoplastic lesions are linked with considerable mortality and morbidity globally. The majority of tumors from the urinary tract are epithelial with 90% being urothelial. A considerable increase has been reported in the past 70 years and urothelial carcinomas are also seen at the urethra, ureters, and renal pelvis apart from the bladder.¹

Urinary bladder cancers are the 9th most common neoplasm globally and the second most common neoplasm of the genitourinary tract after prostate cancer. Bladder neoplasm incidence ranges from 2% to 6% in females and males respectively and the majority of cases are reported after 5th decade. These tumors are more common in males than females from urban residences than in rural populations. Bladder tumors have more prevalence in developed nations in subjects aged 50-80 years.²

The main symptoms of bladder neoplasm are microscopic and gross hematuria with the most common complaint usually seen being painless hematuria in nearly 85% of subjects with bladder cancers followed by clotting leading to painful micturition. Subjects with advanced disease can have lower limb edema or palpable suprapubic mass. In metastasis cases, weight loss with bone pain or abdominal pain is usually seen.³

These lesions are generally treated with cystoscopy which is an endoscopic technique used for visualization of the ureteral orifice, bladder mucosa, and urethra, and is a primary and gold-standard diagnostic tool for detection of cancer allowing complete visualization of bladder mucosa and biopsy of suspicious areas for histopathological assessment. DOI: 10.69605/ijlbpr_14.3.2025.240

Another such procedure is TURBT (Transurethral resection of bladder tumors) which is a diagnostic and therapeutic procedure used for the assessment of different clinical prognostic factors, complete removal, depth of infiltration, and tumor differentiation of the bladder.⁴

MATERIALS AND METHODS

The present prospective clinical study was done at theDepartment of Pathology, Gajaraja Medical College, Gwalior, Madhya Pradesh. The study included 130 subjects with TURBT and cystoscopic biopsies and specimens assessed at the Institute within the defined study period.

All the specimens were received in 10% formalin and tissues were assessed grossly first and the findings were recorded. Entire tissue processing was done in all the cases. Specimens were processed following the standard procedure. Various sections of 3-5 micron thickness were stained with hematoxylin and eosin staining and obtained paraffin block.

Histopathological assessment of the cystoscopic bladder biopsies and TURBT specimens were assessed and lesions were classified as various neoplastic and non-neoplastic lesions depending on the examination under the light microscope.

RESULTS

The present prospective study aimed to assess the histopathological spectrum of urinary bladder lesions with a focus on neoplastic lesions. A total of 130 cases were assessed with 70 TURBT specimens and 60 cystoscopic biopsies from 38.46% (n=50) females and 61.54% (n=80) males. A total of 130 specimens from the urinary bladder were assessed including TURBT (n=70) and cystoscopicbladder biopsy (n=60) cases. The age range of study subjects was 2-80 years with

maximum cases from 61-80 years with 52.08% cases. There were 38.46% (n=50) females and 61.54% (n=80) males in the study respectively. There were 53.85% (n=70) cases of neoplastic lesions and 46.15% (n=60) cases of non-neoplastic lesions in the study.

The study results showed that in the non-neoplastic lesions, the most predominant type was chronic nonspecific cystitis seen in 66.67% of cases. Other cystitis types were six cases of acute or chronic cystitis and two cases each of follicular cystitis, eosinophilic cystitis, polypoidal cystitis, and granulomatous cystitis. Normal histology variants in the study were two cases each of fibroepithelial polyp, cystitis glandularis, and cystitis cystica.It was seen that in the neoplastic lesions, the study results depicted a significant increase in the number of cases in the age range of 61-80 years constituting 57.14% with no cases reported till the age of 40 years. Neoplastic lesions in the study depicted 52 males and 18 females in a male-to-female ratio of 2.8:1 in the study.

For distribution of various urothelial neoplasm in study samples, Invasive urothelial carcinoma, Noninvasive high-grade papillary urothelial carcinoma, Non-invasive low-grade papillary urothelial carcinoma, Papillary urothelial neoplasm of low malignant potential, Urothelial carcinoma in situ, and Urothelial carcinoma in situ was seen in 62.86% (n=44), 17.14% (n=12), 11.43% (n=8), 2.86% (n=2), and 0 subjects respectively (Table 1).

Concerning differentiation of invasive urothelial carcinoma in study subjects, sarcomatoid, clear cell, glandular, squamous, and nil were seen in 5.88% (n=2) subjects each. Nested urothelial carcinoma was not seen in any study subject (Table 2).

 Table 1: Distribution of various urothelial neoplasm in study samples

S. No	Parameter	Number (n)	Percentage (%)
1.	Invasive urothelial carcinoma	44	62.86
2.	Non-invasive high-grade papillary urothelial carcinoma	4	5.71
3.	Non-invasive low-grade papillary urothelial carcinoma	12	17.14
4.	Papillary urothelial neoplasm of low malignant potential	8	11.43
5.	Urothelial carcinoma in situ	2	2.86
6.	Papilloma	0	0
7.	Total	70	100

Table 2: Diffe	rentiation of inv	asive urothelial	carcinoma in	study subjects
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S. No	Parameter	Number (n)	Percentage (%)
1.	Sarcomatoid	2	5.88
2.	Clear cell	2	5.88
3.	Nested	0	0
4.	Glandular	2	5.88
5.	Squamous	2	5.88
6.	Nil	26	76.48

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DISCUSSION

A total of 130 cases were assessed with 70 TURBT specimens and 60 cystoscopic biopsies from 38.46% (n=50) females and 61.54% (n=80) males. A total of 130 specimens from the urinary bladder were assessed including TURBT (n=70) and cystoscopicbladder biopsy (n=60) cases. The age range of study subjects was 2-80 years with maximum cases from 61-80 years with 52.08% cases. There were 38.46% (n=50) females and 61.54% (n=80) males in the study respectively. There were 53.85% (n=70) cases of neoplastic lesions and 46.15% (n=60) cases of nonneoplastic lesions in the study. These data were comparable to the studies of Laishram RS et al⁵ in 2012 and Shah PY et al⁶ in 2016 where authors assessed subjects with demographic data comparable to the present study in their respective studies.

It was seen that in the non-neoplastic lesions, the most predominant type was chronic nonspecific cystitis seen in 66.67% of cases. Other cystitis types were six cases of acute or chronic cystitis and two cases each of follicular cystitis, eosinophilic cystitis, polypoidal cystitis, and granulomatous cystitis. Normal histology variants in the study were two cases each of fibroepithelial polyp, cystitis glandularis, and cystitis cystica. It was seen that in the neoplastic lesions, the study results depicted a significant increase in the number of cases in the age range of 61-80 years constituting 57.14% with no cases reported till the age of 40 years. Neoplastic lesions in the study depicted 52 males and 18 females in a male-to-female ratio of 2.8:1 in the study. These results were consistent with the studies of SrikousthubhaS et al⁷ in 2013 and JecuM et al⁸ in 2014 where non-neoplastic and neoplastic urinary bladder lesions reported by the authors in their studies were comparable to the results of the present study.

The study results showed for distribution of various urothelial neoplasm in study samples, Invasive urothelial carcinoma, Non-invasive high-grade papillary urothelial carcinoma, Non-invasive lowgrade papillary urothelial carcinoma, Papillary urothelial neoplasm of low malignant potential, Urothelial carcinoma in situ, and Urothelial carcinoma in situ was seen in 62.86% (n=44), 17.14% (n=12), 11.43% (n=8), 2.86% (n=2), and 0 subjects respectively. These findings were in agreement with the results of Humphrey PA et al⁹ in 2016 and Matalka I et al¹⁰ in 2008 wherethe distribution of various urothelial neoplasms similar to the present study was also reported by the authors in their respective studies. It was also seen that concerning the differentiation of invasive urothelial carcinoma in study subjects, sarcomatoid, clear cell, glandular, squamous, and nil were seen in 5.88% (n=2) subjects each. Nested urothelial carcinoma was not seen in any study subject. These results correlated with the findings ofKumar MU et al¹¹ in 2012 and Mubarak M et al¹² in 2014 where differentiation of invasive urothelial

carcinoma reported by the authors in their studies was comparable to the results of the present study.

CONCLUSION

Considering its limitations, the present study concludes that Urinary bladder tumors are most commonly seen by pathologists and are heterogeneous. Both malignant and benign lesions have been reported with malignant lesions being common with male predilection and in elderly subjects that are smokers. Identification of invasion extent with microscopy is a vital aspect of urothelial carcinomas.

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