Spectrum of Lesions in the Urinary Bladder: A Histopathological Study in a Tertiary Level Hospital

Suman Poudel,[1] Sunita Ranabhat,[1] Sharmila Shahi,[1] Gita Pun[1]

[1]Department of Pathology, Gandaki Medical Collage Teaching Hospital, Pokhara, Nepal.

ABSTRACT

Introduction

Urinary Bladder cancer is the 7th most common cancer worldwide, with an estimated 260,000 new cases occurring each year in men and 76,000 in women. 90% of the bladder tumors are of urothelial origin. Cystoscopic examination has a limited role in staging process for which transurethral resection (TURBT) of visible tumor down to the base is required which can accurately assess depth of tumor invasion. This study is aimed to study the different spectrum of urinary bladder lesions in tertiary level hospital.

Methods

Study included 55 transurethral resection specimens, conducted over a period 12 months, extending from January 2022 to December 2022. Hematoxylin & Eosin (H&E) stained sections were examined for morphologic diagnosis of urothelial lesions.

Results

In our study, there was male preponderance with ratio of 3.2:1. Among 55 cases studied, 34.55% cases were diagnosed as invasive urothelial carcinoma, 27.27% cases were of non-invasive urothelial carcinoma, 16.36% cases were of benign urothelial neoplasm and 16.36% cases were of non-neoplastic lesions in urinary bladder. There were also 1.82% cases of adenocarcinoma, metastasis and non-diagnostic each in our study. Amongst invasive carcinoma high grade were encountered most (30.91%) cases.

Conclusions

This study revealed that neoplastic lesions are more common than non-neoplastic lesions. Urothelial tumors are seen commonly in seventh decade with overall male predominance. Also this study, documents a high frequency of invasive than non-invasive type of urothelial neoplasm.

Keywords: bladder lesions; TURBT; papillary urothelial carcinoma; invasive; non-invasive.

Correspondence: Dr. Suman Poudel, Department of Pathology, Gandaki Medical Collage Teaching Hospital, Pokhara, Nepal. Email: batigsu@gmail.com. Phone: +977-9855068418.

INTRODUCTION

Urinary bladder lesions can be neoplastic or non-neoplastic that can be troublesome for the general population. It has now become a common problem among the elderly population that forced them to visit hospitals and medical centers.[1] The most common non-neoplastic lesion is cystitis. However, common neoplastic lesion is invasive urothelial carcinoma among primary tumors.[2] Urinary bladder neoplasms are most common in 6th decade with predominance in male patients with an estimated 260,000 new cases occurring each year in men and 76,000 in women. This difference is probably accounted by differences in smoking habits and occupational exposure in the two sexes.[3] There are various techniques like ultrasonography, computed tomography, magnetic resonance imaging for detection of tumor. But, the direct cystoscopy of the urinary bladder lesions and transurethral resection of the tumor deep to base with histopathology leads to accurate assessment of the depth of tumor invasion and management of the cases.[4] Despite the various techniques in diagnosis of the tumor as well as intra-vesical and systemic therapies, patients with muscle invasive carcinoma experienced a bad prognostic outcomes.[5] However, the prognosis and clinical significance of bladder tumors depends upon their histological grade, differentiation and the depth of invasion.[6] This study is aimed to study the different spectrum of urinary bladder lesions in tertiary level hospital.

METHODS

Ahospital based retrospective cross sectional study was performed in the Department of Pathology, Gandaki Medical Collage Teaching Hospital, Pokhara for the period of 12 months from 1st January to 30th December 2022. The ethical clearance for the study was obtained from GMC-Institutional Review Committee (IRC) (Ref No. 296/079/080). The well labelled bladder specimens were received, processed and stained with H&E stain. The prepared slides were evaluated by consultant pathologists. The sections were studied for the morphology of the bladder lesions. The bladder lesions were classified on the basis of WHO classifications. The data were collected filling the proforma and subjected to statistical analyses using Statistical Package for Social Sciences (SPSS version 16).

RESULTS

Among the total of 55 cases, predominant of TURBT specimens More TURBT specimens from the patients aged 71-80 years i.e. 14 (25.5%), followed by 61-70 years 12(21.8%) and least from the age group 31-40 years 2(3.6%), 42 (76.4%) were received from male and remaining were from female patients. (Table 1).
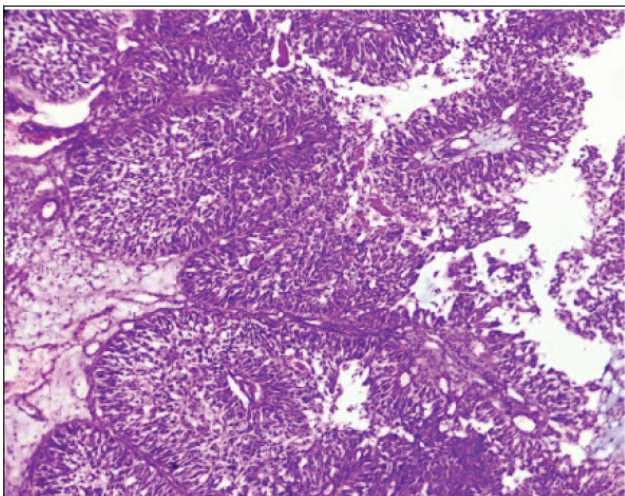
Table 1. Frequency of cases with respects to age and gender (n=55).

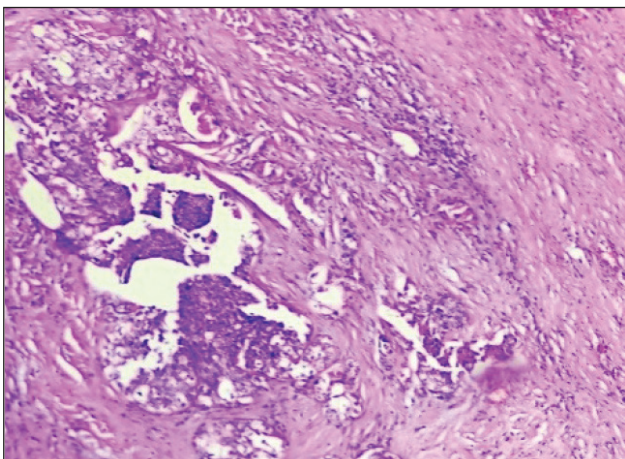| Age	Frequency (%)
21-30	4(7.3)
31-40	2(3.6)
41-50	4(7.3)
51-60	9(16.4)
61-70	12(21.8)
71-80	14(25.5)
81-90	10(18.2)
Gender	
Male	42 (76.4)
Female	13(23.63)

Invasive high grade neoplasm (30.91%) was the most common diagnosis, followed by Non- invasive low grade neoplasm (18.18%). The least common diagnosis made were non-diagnostic, metastatic, denocarcinoma and inverted urothelial papilloma each comprising 1.82% of total cases.Frequency and percentage of histopathological diagnosis is shown in (Table 2).
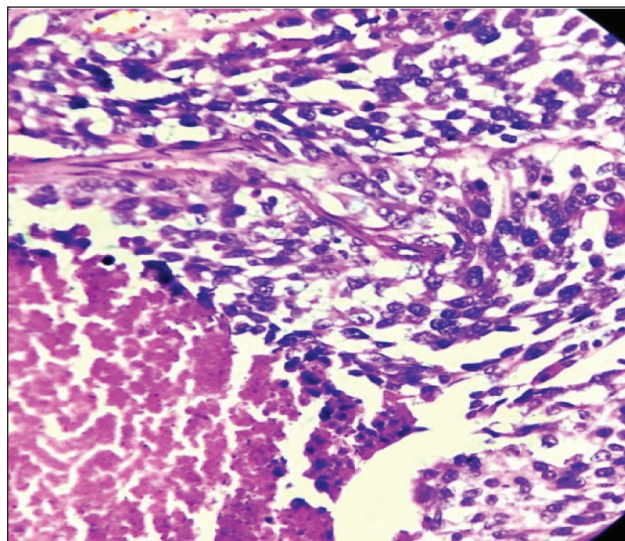
Table 2. Frequency of histopathological diagnosis.

Histopathological diagnosis	Frequency(%)
Non diagnostic	1(1.82)
Metastic	1(1.82)
Adenocacinoma	1(1.82)
Invasive high grade Neoplasm	17(30.91)
Invasive low grade Neoplasm	2(3.64)
Non-Invasive high grade Neoplasm	5(9.09)
Non-Invasive low grade Neoplasm	10(18.18)
PUNLMP	4(7.27)
Inverted Urothelial papilloma	1(1.82)
Urothelial papilloma	4(7.27)
Non Neoplastic	9(16.36)

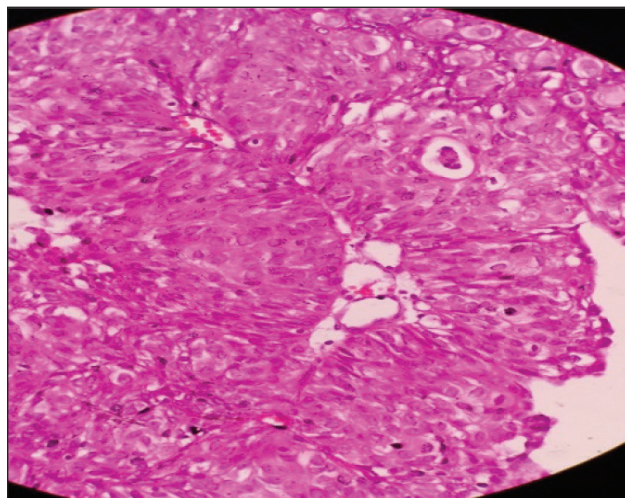**Figure 3.** Pleomorphic cells along with necrosis in high grade urothelial neoplasm.

Figure 1. Invasive Urothelial Neoplasm, High Grade. Section showed tumor cells arranged in fused papillae.

Figure 4. Loss of polarity and crowded cells in non- invasive low grade dysplasia.

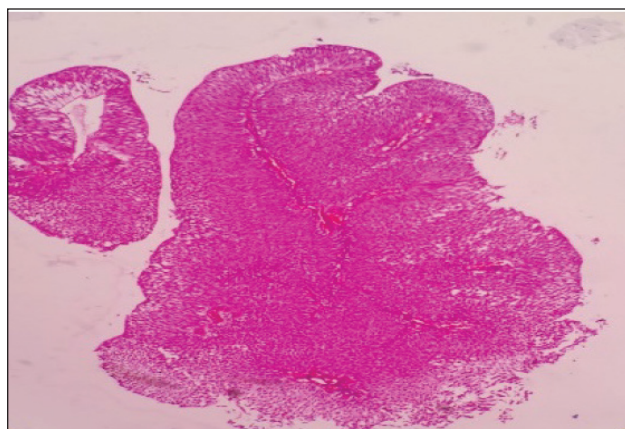
Figure 2. Invasive urothelial neoplasm; High Grade Section showed tumor cells infiltrating the muscularis propria.

Figure 5. Papillary Urothelial Neoplasm of Low Malignant Potential (PUNLMP).

DISCUSSION

The histopathological diagnosis helps to differentiate benign and malignant urothelial lesions based on morphological features. Since every histological variant has unique characteristics based on metastatic potential, susceptibility to radiation or chemotherapy, histopathology can play vital role in its diagnosis and management. Also every variant offers a unique diagnostic and therapeutic challenge.[7] The present study showed male preponderance for the urinary bladder lesions 42(76.4%) and similar type of results were seen in study done by Roshed et al.[8] and Lashiram et al.[9] This may be due to occupational exposure and habitual facts. The cigarette smoking, industrial exposure to acrylamine in male leads to higher chance of bladder tumor in them.[10] As shown in table 1, the urinary bladder lesions were commonly seen in seventh decade of life. Similar to our results, the study done by Paudel et al. also show similar age range of 60-80 years.[11] However, in other studies done by Shah et al.[1] Pokar and Prasanna et al.[5] the commonest age of presentation was sixth decade of life. The bladder tumors are thought to be commonly found in elderly population because of treatment related toxicity secondary to medical comorbidities with poor immune response.[12] In our study, the urinary bladder lesions were found to be neoplastic accounting 83.64% where as non-neoplastic lesions account 16.36%. Invasive high grade neoplasm (30.91%) was the most common diagnosis, followed by non- invasive low grade neoplasm (18.18%). The least common diagnosis made were non-diagnostic, metastatic, adenocarcinoma and inverted urothelial papilloma each comprising 1.82% of total cases. The study done by Kriti Piya et al.[2] also found invasive high grade neoplasm to be the common findings in their study. Discordance to ours, the study done by Thapa et al.[13] and Mainali et al.[14] showed the predominance of low grade urothelial neoplasm accounting for 50.91% and 49.2% respectively. The invasive high grade neoplasm showedtumor cells invading the muscle layer as demonstrated in fig.2. the Fig. 1, 3 demonstrated the tumor cells exhibiting marked anaplastic features with pleomorphism, high N:C ratio, coarse chromatin, irregular nuclear contour and moderate to scant cytoplasm. Frequent atypical mitoses were noted throughout the layers of papillae along with foci of necrosis(Fig.3). However, in non- invasive low grade neoplasm slight loss of polarity was noted with atypical mitosis in lower $1/3^{rd}$ of papillae (Fig.4). Similar type of tumor morphology was demonstrated by Lopez- Beltran et al.[15] The other neoplastic lesions encountered were benign comprising of Papillary Urothelial Neoplasm of Low Malignant Potential (PUNLMP) (Fig.5), Urothelial Papilloma each comprising 7.27%. Single (1.82%) case of inverted papilloma, metastatic deposits and adenocarcinoma were noted in the present study. The study done by Thapa et al.[13] also showed low frequency of benign urothelial lesions.In our study, the frequently encountered non-neoplastic lesions were chronic cystitis, granulomatous cystitis and cystitis cystica et. glandular is altogether comprising of 16.36% of total cases. The study done by Shah et al.[1] showed various forms of cystitis to be common non neoplastic lesions.

CONCLUSIONS

A variety of urinary bladder lesions are commonly encountered in our day to day practice. Urinary bladder biopsy is one of the most common biopsies in general population. In our study, the bladder lesions were commonly seen in 7th decade of life with overall a male preponderance. Also this study, documented a high frequency of invasive than non-invasive type of urothelial neoplasm. Invasive urothelial carcinoma, high grade constituted the commonest of urothelial tumors.

Acknowledgements

The authors express sincere thanks to faculties and residents of Department of Pathology, GMC-TH for their support in data collection, statistical analysis and guidance.

REFERENCES

1. Shah A, Srivastava M, Samdurkar A, Sigdel G. Spectrum of Lesions in Urinary Bladder- A Histopathological Study. Journal of Universal College of Medical Sciences. 2018 Dec 3;6(2):24–7.

2. Kirti Priya RRB. A study on histopathological spectrum of lesions in urinary bladder specimens in tertiary center in Bihar. European Journal of Molecular & Clinical Medicine. 2022 Mar 18;9(3):750–8.

3. Gajjar DD, Faujdar DM, Jain DR, Gupta DS. Histomorphological spectrum of urothelial tumors according to WHO/ISUP consensus classification (2016): Tertiary care center study. Int J Clin Diagn Pathol. 2019;2(1):191–5.

4. Dhatwalia A, Sharma SK, Kumar V. Histopathological Profile of Urinary Bladder Tumours at Tertiary Care Centre in a Northern State of India: A Cross Sectional Study. International Journal of Research and Review. 2020;7(6):156–9.

5. Pokar R, Parsana R. Spectrum of histopathological variants in urinary bladder carcinoma- Experience in a tertiary care hospital. IP Archives of Cytology and Histopathology Research. 2022 Dec 15;7(4):237–40.

6. Al-Samawi AS, Aulaqi SM. Urinary Bladder Cancer in Yemen. Oman Med J. 2013 Sep;28(5):337–40.

7. Black AJ, Black PC. Variant histology in bladder cancer: diagnostic and clinical implications. Translational Cancer Research [Internet]. 2020 Oct [cited 2023 Mar 22];9(10). Available from: https://tcr.amegroups.com/article/view/41634

8. Roshed MM, Ms MA, Ali M. Histomorphological pattern of urinary bladder mass with their clinical correlation. Bangladesh Medical Journal Khulna. 2021;54(1–2):3–7.

9. Laishram RS, Kipgen P, Laishram S, Khuraijam S, Sharma DC. Urothelial tumors of the urinary bladder in Manipur: a histopathological perspective. Asian Pac J Cancer Prev. 2012;13(6):2477–9.

10. Jhaveri PN, Makwana SV, Oza KK, Shah CK. A histopathological study of urinary bladder neoplasms. Indian Journal of Pathology and Oncology. 2021 Feb 15;8(1):59–63.

11. Paudel D, Regmi H, Bajracharya U, Shrestha GK. Spectrum and Presentation of Urinary Bladder Growth: a Single-Center Retrospective Study. Nepalese Medical Journal. 2021 Dec 31;4(2):485–8.

12. Guancial EA, Roussel B, Bergsma DP, Bylund KC, Sahasrabudhe D, Messing E, et al. Bladder cancer in the elderly patient: challenges and solutions. Clin Interv Aging. 2015 Jun 10;10:939–49.

13. Thapa R, Lakhey M, Bhatta AD. Spectrum of histomorphological diagnosis in cystoscopic bladder

biopsies. Journal of Pathology of Nepal. 2017 Mar 30;7(1):1062–5.

14. Mainali N, Chaudhary P, Nepal N, Shrestha J. Spectrum of Urothelial lesions in Cystoscopic biopsies: A Histopathological Perspective. Journal of Nobel Medical College. 2018 Aug 22;7(1):6–10.

15. Lopez-Beltran A, Cheng L, Mazzucchelli R, Bianconi M, Blanca A, Scarpelli M, et al. Morphological and molecular profiles and pathways in bladder neoplasms. Anticancer Res. 2008;28(5B):2893–900.

Citation: Poudel S, Ranabhat S, Shahi S, Pun G. Spectrum of Lesions in the Urinary Bladder: A Histopathological Study in a Tertiary Level Hospital. 2023; 19(3); 307-12.