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Original Article

Bladder biopsies: A histopathological study

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ABSTRACT

Background: Urinary bladder lesion, both neoplastic and non neoplastic is a clinical condition with a significant impact on public health. Many risk factors like smoking, environmental exposures and increasing age are associated with neoplastic conditions.

Objective: The objective of the study was to find the frequency and histopathological features of urinary bladder lesions in Dhulikhel Hospital over a period of five years.

Methods: A hospital-based retrospective study wasconducted in the department of pathology of Dhulikhel hospital from 2019-2024. Ethical approval was taken from the institutional review committee of Kathmandu University School of Medical Sciences. After sample collection, the data were entered in Microsoft Excel 2010 and analyzed using Statistical Package for the Social Sciences version 23.

Results: In our study, both neoplastic and non neoplastic lesions of the urinary bladder were studied and neoplastic conditions were more prevalent as compared to non neoplastic lesions. Out of 55 cases studied, 43 cases (78.2%) were neoplastic lesions while 12 cases (21.8 %) had normal findings and non neoplastic lesions. The maximum number of cases were from the age group 71-80 years i.e. 18 cases (32.7%). The majority of the cases were male i.e. 43 cases (78.2%) in contrast with12 (21.8%) female cases. 38 cases (69.1%) had a history of smoking, 12 (21.8%) with alcohol intake history while only 3 cases (5.5%) had history of pesticide exposure.

Conclusions: Thus, from our study we concluded that neoplastic lesions are much common as compared to non neoplastic lesions of the urinary bladder.

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INTRODUCTION

The urinary bladder is a sac that serves as a urine reservoir.[1] It is located in the extraperitoneal space of the pelvis behind the pubic bones and extends into the abdomen when filled with urine. The bladder divides into two main parts, each with its features: the upper part, above the ureteric orifices, is composed of the apex and body, while the lower part is composed of the fundus, trigone, and neck. The capacity of the bladder is about 500 mL in healthy individuals.[1]

Bladder cancer has been associated pathogenetically with many etiological factors. The risk factors include: cigarette smoking, exposure to aniline dyes, male gender, age, viral agents, bacterial and parasitic infections, cystolithiasis, cyclophosphamide therapy, pelvic irradiation[4], and alcohol.[2-5]

Bladder cancer occurrence is highest in Europe and North America while in Asia and some parts of Africa it is the lowest.[6,7] An estimated 429,800 new cases of bladder cancer and 165,100 deaths occurred in 2012 worldwide.[4] There were 15,210 deaths recorded in 2013, including 10,820 men and 4390 women, and accounts for 3% of all cancer deaths in the United States.[6-8] Urothelial carcinoma is the most common tumor of the bladder, representing 90% of malignancies with this origin. Other malignancies include 5% are squamous cell carcinomas (5%), and adenocarcinoma or other variants (<2%). [2]

Cystoscopy is the primary diagnostic tool for patients with bladder lesions. It provides information on the appearance, number, and location of bladder lesions and provides biopsy materials for histological evaluation of suspicious lesions. However, specimens obtained from cystoscopic biopsy are not sufficient for further characterizing neoplastic lesions in terms of depth of invasion and margin status. Transurethral resection of the bladder tumor (TURBT) or cystoscopic biopsy is a therapeutic procedure that ensures the material necessary for histopathological diagnosis because it allows assessment of the histological type and the degree of differentiation, depth of tumor invasion, and other parameters that are useful in elaboration of diagnosis and subsequent treatment and prognosis.[9] In urinary bladder lesions, the clinical presentation is quite variable; the non-neoplastic lesions can mimic neoplastic and vice-versa bothering both clinicians and patients. [10,11]

The present study aims to study the frequency and histopathological features of all cystoscopic biopsies of the urinary bladder obtained over five years in Dhulikhel Hospital.

MATERIALS AND METHODS

A hospital-based retrospective was conducted in Dhulikhel Hospital, Kavre. Prior approval (approval no. 259/24) from the institutional ethical committee was taken before the onset of the study. A total of 55 (43 males and 12 females) cases of urinary bladder biopsies diagnosed at Dhulikhel Hospital, Kathmandu University School of Medical Sciences from July 2019 to July 2024 were included in the study. A detailed clinical history with the histopathological findings of each case was recorded in a predesigned proforma. Privacy and confidentiality of all these cases were maintained. Record books and software used in the Department of Pathology, Dhulikhel Hospital were used to compile all the cases.

RESULTS

A total fifty five (43 males and 12 females with M: F = 3.58: 1) patients of urinary bladder biopsies were diagnosed. The age of the patient at presentation ranged from 45-89 years (average age of 66.76 years). Sex-wise distribution of bladder cancer is shown in Table 1.

Table 1:Sex wise distribution of cases

Gender	No. of cases	Percentage (%)
Male	43	78.2
Female	12	21.8
Total	55	100

Among those patients (N=55) included in this study, a maximum of the cases were from the age group 71-80 (18 cases).

Table 2: Age-wise distribution of cases

Age	No. of cases	Percentage (%)
<=50	6	10.9
51-60	9	16.4
61-70	16	29.1
71-80	18	32.7
>=81	6	10.9
Total	55	100

38 cases (69.1%) had a smoking history while 12 cases (21.8%) had an alcohol intake history. Only 3 cases (5.5%) gave a history of exposure to pesticides.

8 cases (14.5%) were found to be normal urothelium while benign cases were in 4 (7.3%) out of 55 cases. Benign included cases with inflammatory cystitis and urothelial papilloma. The number of Malignant cases was 43 (78.2%)

Table 3:Normal, Benign, and Malignant cases

Diagnosis	No. of cases	Percentage (%)
Normal urothelium	8	14.5
Benign	4	7.3
Malignant	43	78.2
Total	55	100

Non-invasive papillary urothelial carcinoma- Low grade and High grade (15 and 17 cases, 27.3% and 30.9% respectively) were among the highest malignant cases which were diagnosed.

Different diagnoses given to the total 55 cases are mentioned in Table 4.

Table 4: Histopathological diagnosis of the cases

Diagnosis	No. of cases	Percentage (%)
Normal urothelium	8	14.5
Inflammatory cystitis	3	5.5
Urothelial papilloma	1	1.8
PUNLMP	3	5.5
Non-Invasive papillary urothelial carcinoma- Low grade	15	27.3
Non-Invasive papillary urothelial carcinoma- High grade	17	30.9
Invasive urothelial carcinoma	6	10.9
Inflammatory myofibroblastic tumor	1	1.8
Urothelial carcinoma with squamoid differentiation	1	1.8
Total	55	100

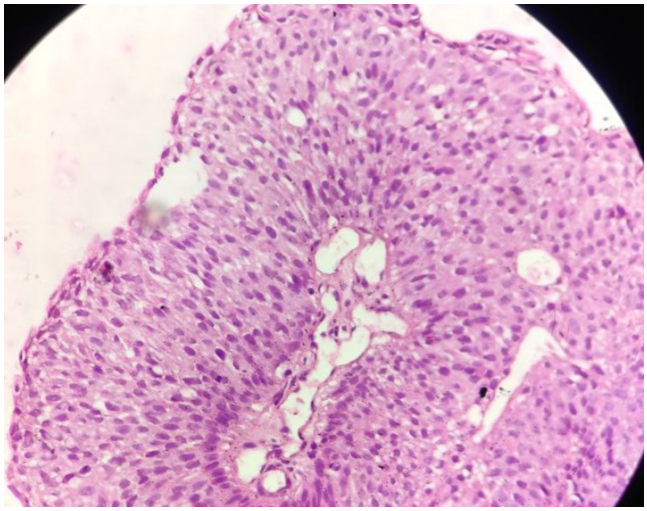

Figure 1: *Non-invasive urothelial carcinoma, low grade, (H and E. 100x)*

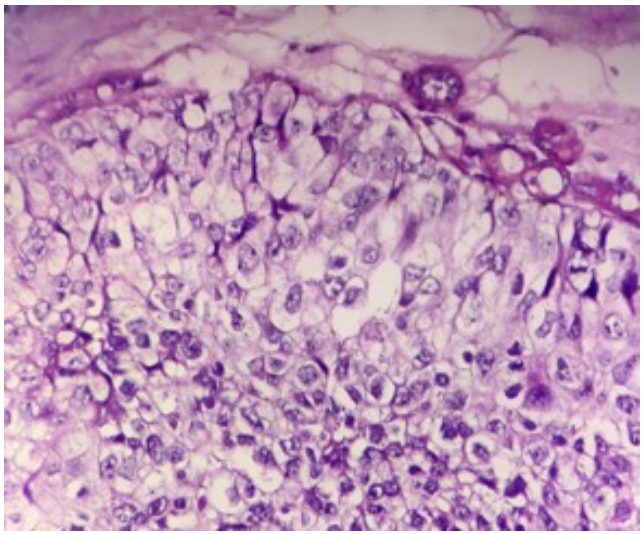

Figure 2: *Non-invasive urothelial carcinoma, high grade, (H and E. 400x)*

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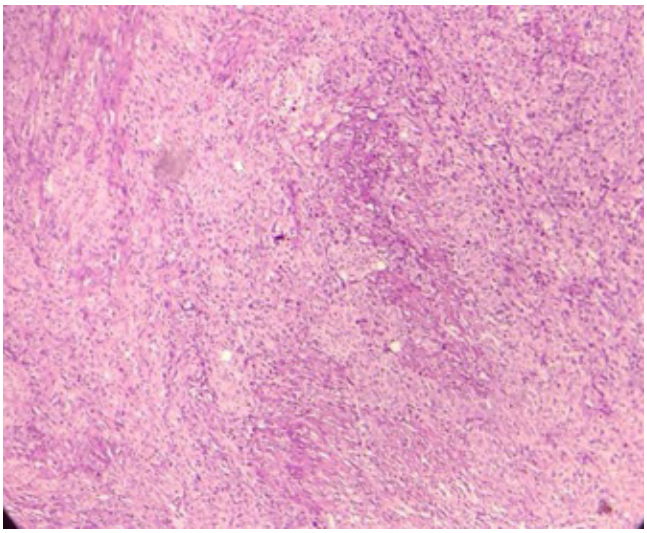

Figure 3: *Urothelial carcinoma with squamoid differentiation, (H and E. 40x)*

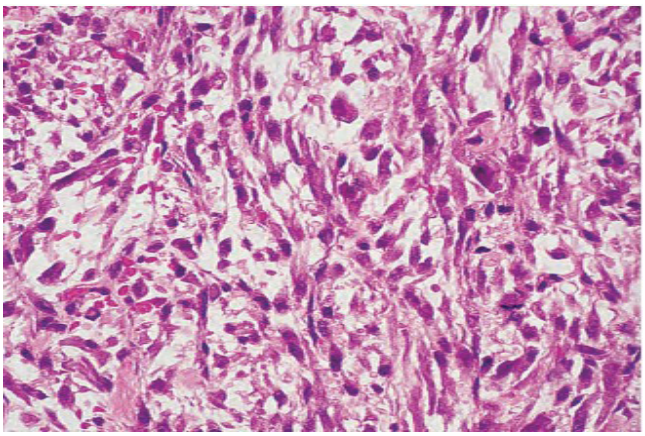

Figure 4: *Inflammatory myofibroblastic tumor,)H and E. 400x)*

DISCUSSION

Males are more prone to the occurrence of urinary bladder lesions than females (M: F = 3:1).[12,13]The present study also shows a similar distribution pattern (M:F = 3.58:1). Furthermore, studies by Gupta P et. al.[14] in India and Saginala K et. al.[15] showed the male to female ratio of 8.6:1 and 4:1 respectively. This shows that similar to other parts of the world, in Nepal also, the incidence of urinary bladder carcinoma is higher in males than in females.

The reason for higher incidence in males could be attributed to environmental, dietary exposure, anatomical differences, urinary habits and hormonal factors whereas, less incidence of bladder cancer in females could be due to less exposure of females to individual carcinogens and less smoking.[14,16,17,18]

In the present study, 69.1% of patients had a history of smoking. The present result is comparable to the study done in India and Pakistan where the patients who were smokers having bladder cancer were 74% and 65%.[13,19] Similar study was conducted by Rafique M. et. al where cigarette smoking

showed 50% and 31% of bladder cancer in men and women respectively.[11]

One of the most important established etiological factors of urinary bladder cancer is smoking, increasing the risk by 4fold than non smoker[13,20-24].

Chemicals like 4-aminobiphenyl and beta-napthylamyne are suggested to be the precipitating factors as the concentration of those compounds is high in the urine of smokers.[20,25] Further, it is found that former smokers have a lower incidence of bladder cancer than active smokers. The incidence of bladder cancer is also linked to p53 mutation as a study has shown that there is an increase in p53 mutation in urothelial cells of smokers than non smokers.[26, 27]

The present study shows an increased incidence of bladder cancer with increasing age. The study done by Pudasaini et. al. also suggests that the incidence of bladder cancer increases with the increase in age. [28]

In our study, the number of cases with a history of alcohol consumption was only 12 (21.8%) who had developed urinary bladder lesions. A study conducted by Mao Q et. al found no significant association between alcohol drinking and bladder cancer.[29] Similar studies were Zeegers P.A. et. al the results of this study did not suggest an important risk factor for alcohol consumption.[7]

In our study, occupational exposure to pesticides was found only in 3 cases. In a study conducted by KoutrousS et. al. an exposure-response relationship, however, was observed among never smokers, with the highest category of exposure experiencing a 3-fold risk.[30] In a similar study conducted by Amr S, et. al. showed men and women in farming and who never smoked had increased risk for either Squamous cell Carcinoma or Urothelial carcinoma.[31]

Urinary bladder lesion encompasses a spectrum of benign and malignant lesions and is associated with various risk factors. Among these, the most important risk factors include age, gender, smoking, alcohol, and occupational exposure. [2-5]

Histologically, the present study showed a higher frequency of malignant lesions 43 (78.2%) than non-malignant lesions 12 (21.8%). A higher frequency of malignant lesions was also seen in a study done by Dhakal R et. al., in which malignant lesions consisted of 57.1% and non-malignant lesions 42.9%.[32]

In our study, among the malignant lesions, Low-grade non-invasive papillary urothelial carcinoma and High-grade non-nvasive papillary urothelial carcinoma were of the highest number with frequencies of 15 (27.3%) and 17 (30.9%) respectively. Similar findings were seen in the study done by Dhakal R et. al., in which low-grade and high-grade non-invasive papillary urothelial carcinoma accounted for 31.4% and 21.4% of the total cases respectively.[32]

CONCLUSION

Most of the bladder lesions were common in males. With increase in age, there was an increase in the incidence of bladder carcinoma. Neoplastic lesions were much more common as compared to non-neoplastic lesions of the urinary bladder. Among neoplastic lesions, non-invasive papillary urothelial carcinoma was the most common bladder tumor.

LIMITATIONS OF THE STUDY

This was single center based study with limited sample size and short duration of study period. The information obtained is from the record books. Direct interaction with the patients was not done.

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CONFLICT OF INTEREST

There was no conflict of interest.

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AUTHORS' CONTRIBUTION

Contributed in finding cases in record books, confirming by studying the slides of all cases under the microscope, taking microphotographs, entering the data in MS-Excel, result interpretation and manuscript writing.

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