



ISSN (P): 2617-7226
ISSN (E): 2617-7234
www.patholjournal.com
2024; 7(1): 31-34
Received: 14-12-2023
Accepted: 15-01-2024

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A histopathological study of urinary bladder neoplasms

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DOI: <https://doi.org/10.33545/pathol.2024.v7.i1a.553>

Abstract

Background: Urinary bladder neoplasm is the most common urinary tract neoplasm, with urothelial carcinoma being the most common histologic type.

Material and Methodology: 54 patients diagnosed with urinary bladder neoplasm in Civil Hospital, Ahmedabad during January 2021 to December 2023 were included in study. Biopsy are send to Histopathology Department. Specimen was fixed with 10% formalin, Cut and Processed. The block was made and then it cut in thin sections on Rotatory Microtome and mounted on Slide. The slide is stained with H&E stain and mounted with DPX and coverslip. Then observe under Microscope.

Result: Males are more commonly affected than females (M: F ratio is 5:1). Majority of patients were in the age group of 51 to 70 years. A large percentage of high grade urothelial carcinomas presented with muscle invasion which gives poor outcomes to the patient.

Conclusion: Urothelial carcinoma was the commonest lesions seen in urinary bladder biopsies. Histopathology of Bladder tumor is superior to all other supportive investigations. Further work ups of tumor specimen can be done by immunohistochemistry and molecular studies. Early diagnosis of bladder neoplasm will give better treatment approach and prognosis of patient.

Keywords: Urinary bladder neoplasm, urothelial carcinoma, muscle invasion

Introduction

Bladder neoplasm is any neoplasm that arises from the urinary bladder. It is the most common urinary tract neoplasm, with urothelial carcinoma (UC) being the most common histologic type.

Urinary bladder neoplasm is responsible for significant morbidity and mortality. Urothelial carcinoma is the commonest type accounting for 90% of all primary malignant tumors of the bladder.

Urinary bladder neoplasm is a complex and heterogeneous disease with a broad spectrum of histological findings and potentially lethal behavior. Despite advances in surgical techniques as well as intravesical and systemic therapies, patients with muscular invasion experience disease progression, recurrence and eventual death.

External risk factors are Cigarette smoking, occupational carcinogens, *Schistosoma haematobium* infection in endemic areas, long term use of analgesics, Irradiation.

Although progress has been made in non-invasive imaging, bladder cancer diagnosis and treatment are done through physical examination, cystoscopic evaluation and histopathologic analysis.

Aims

- To study the Histopathology of urinary bladder neoplasms.
- To assess various types of urinary bladder neoplasm with respect to age and sex distribution.
- To categories urinary bladder neoplasm according to TNM staging.
- Early diagnosis and staging of urinary bladder neoplasms.

Materials and Methodology

54 patients diagnosed with urinary bladder neoplasm in Civil Hospital, Ahmedabad during January 2021 to December 2023 were included in study.

Biopsy are taken by surgeons and specimen send to Histopathology Department. Specimen was Fixed overnight with 10% formalin, Cut and Processed in tissue processor and embedded in paraffin wax. The block was made and then it cut in thin sections on Rotatory Microtome and mounted on Slide. The slide is stained with H&E stain and mounted with DPX and coverslip. Then observe under Microscope.

Inclusion Criteria

All neoplastic cystoscopic biopsies and radical cystectomy specimens that turned out to be neoplastic were included in the study.

Exclusion Criteria

Autolysed specimen and inadequate biopsies were excluded from the study.

Observation and Results

In this study total 54 patients were studied in which 45 are males (83.3%) and 9 are females (16.7%). That gives M: F ratio of 5:1. Chief complain of patient having bladder neoplasms are mainly Hematuria followed by burning Micturition, Abdominal pain.

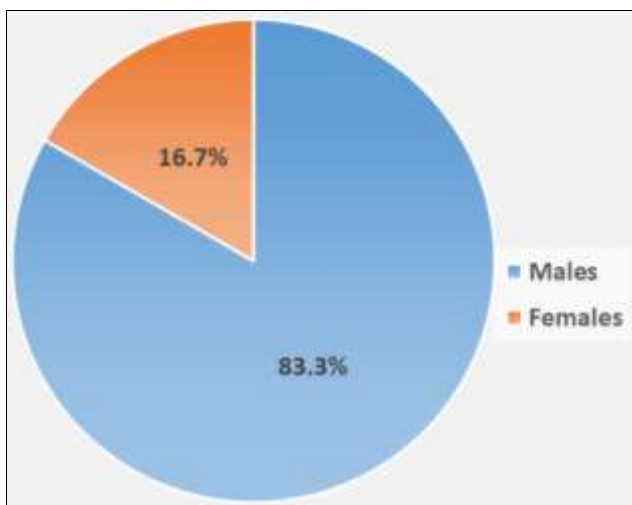


Fig 1: Incidence of Urinary Bladder neoplasm with respect to Gender

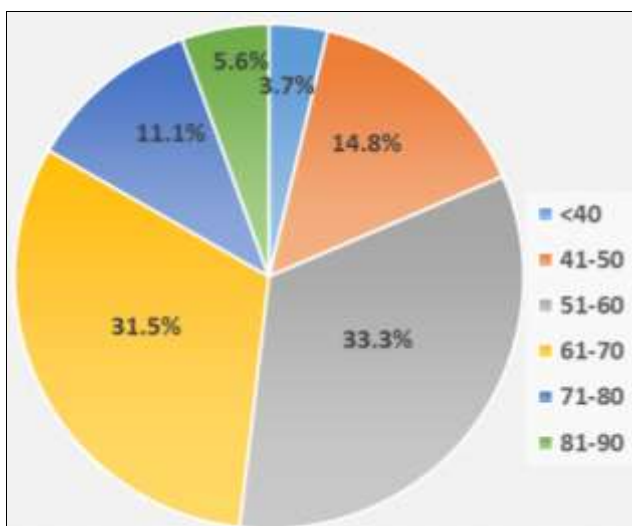


Fig 2: Incidence of Urinary Bladder neoplasm with respect to Age (In years)

Table 1: Age wise Distribution of Urinary Bladder neoplasms

Age Group (years)	Total no. of Patients	Percentage (%)
<40	2	3.7
41-50	8	14.8
51-60	18	33.3
61-70	17	31.5
71-80	6	11.1
81-90	3	5.6

Bladder tumors can invades Muscle, Lymphatic channels, Blood vessels and perineural sheaths.

In this study 29 patients (53.7%) out of 54 patients have Muscularis propria invasion. 2 patient (3.7%) have not seen any muscle tissue in entire biopsy sections therefore deep biopsy with muscle layer was advised for accurate TNM staging.

3 patient (5.6%) out of 54 patients have perineural invasion. 11(21.6%) patients are positive for lymphatic invasion in this study.

Table 2: Presence of muscle invasion in urinary bladder neoplasm

Muscle invasion	Total no. of Patients	Percentage (%)
Present	29	53.7
Absent	23	42.6
Muscle layer is not seen in entire biopsy section	2	3.7

Discussions

Histopathology of bladder neoplasms are mainly 4 types.

1. Non-invasive papillary carcinoma,
2. Invasive papillary carcinoma,
3. Flat non-invasive carcinoma (CIS)
4. Flat invasive carcinoma

Primary bladder tumor can be stage into 4 categories

- Ta - Non-invasive, papillary
- Tis - Carcinoma in situ (non-invasive, flat)
- T1 - lamina propria invasion
- T2 - muscularisproria invasion
- T3a - microscopic extravescicle invasion
- T3b - Grossly apparent extravescicle invasion
- T4 - Invasive adjacent structures



Fig 3: Gross image of urinary bladder neoplasm

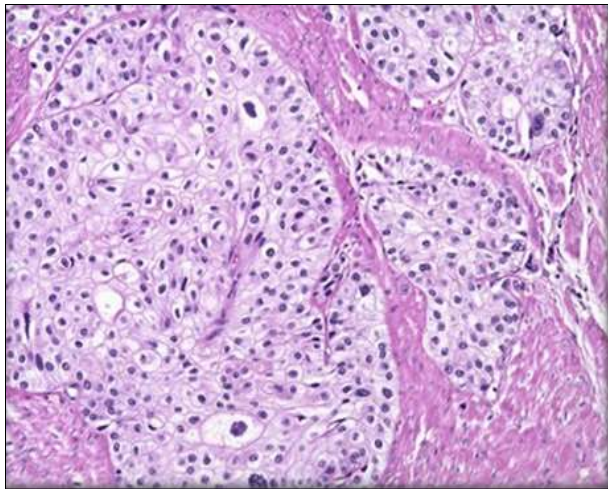


Fig 4: Invasive urothelial carcinoma showing irregular cells invading the muscle layer

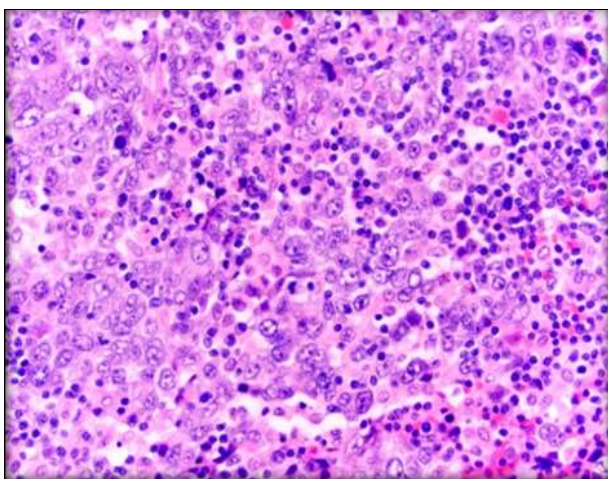


Fig 5: Higher magnification showing enlarged vesicular Nuclei, prominent nucleoli, indistinct cell borders, mitotic figures and the inflammatory component. (Lympho-epithelioma like carcinoma bladder)

Invasive urothelial carcinoma has a heterogeneous morphology. Typical invasive urothelial carcinoma shows irregularly distributed nests of urothelial cells, either with rounded or jagged contours. Stromal response to invasive urothelial carcinoma varies widely but includes fibrosis, inflammatory reaction, desmoplasia, myxoid change, stromal retraction clefts.

Lymphoepithelioma-like carcinoma (LELC) variant of urothelial carcinoma resembles the nasopharynx lymphoepithelioma, but unlike this, it is not related to Epstein-Barr virus. It is composed of nests, sheets, and cord of poorly differentiated cells with pleomorphic nuclei, prominent nucleoli, and indistinct cytoplasmic borders with syncytial appearance. A characteristic feature of this tumor is a dense infiltrate of lymphoid cells that may mask the carcinoma cells. Immunohistochemistry for cytokeratins (7 and 20) and urothelial markers (p63, GATA3, and uroplakin) highlights the epithelial cells for the diagnosis of LELC.

Other variants of urothelial carcinoma includes the nested type variant, Plasmacytoid/diffuse variant, Micropapillary urothelial carcinoma.

A micropapillary tumor is an aggressive variant of urothelial carcinoma, at the time of detection more than 95% of these tumors are muscle invasive and in advanced stage, and

lymph node involvement occur up to 35% of the patients. This variant is frequently mixed with conventional urothelial carcinoma or other variant.

Sarcomatoid urothelial carcinoma is an aggressive variant of urothelial carcinoma characterized by both epithelial and mesenchymal malignant differentiation, and undifferentiated high-grade spindle cell sarcoma is the mesenchymal component observed most frequently.

Present study show peak incidence of bladder tumor in 51 to 70 years (64.8%). This observation is also correlate with previous study. (Muhammed M, Javed IK 2014) [3], (Vaidya S, Lakhey M 2013) [4]. Also gender wise bladder tumor are more common in males (M:F ratio is 5:1). This observation is also correlate with previous study. (Muhammed M, Javed IK 2014) [3], (Vaidya S, Lakhey M 2013) [4], (Chalasanani V 2009) [5].

Associated pathology included chronic cystitis in 4 cases, 2 case each of associated chronic prostatitis and granulomatous inflammation. 1 case is lympho-epithelioma like carcinoma bladder.

Conclusion

In present study, Urothelial carcinoma was the commonest lesions seen in cystoscopic biopsies as well as cystectomy specimen. Males are more commonly affected than females. Majority of patients were in the age group of 51 to 70 years. A large percentage of high grade urothelial carcinomas presented with muscularis propria invasion. Inclusion of muscle layer in the cystoscopic biopsy helps in accurate diagnosis and staging of tumor. Problem happens when only a small portion of a neoplasm is obtained in a biopsy specimen; problems rarely arise when the entire lesion is available for examination. Early diagnosis of bladder neoplasm will give better treatment approach and prognosis of patient.

Conflict of interest

Not Available

Financial support

Not Available

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How to Cite This Article

Dhotre S, Patel S, Mardiya J, Patel B, Goswami H. A histopathological study of urinary bladder neoplasms. International Journal of Clinical and Diagnostic Pathology. 2024;7(1):31-34.

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