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Original Research Article

Histopathological Study of Non-Neoplastic and Neoplastic Lesions of Urinary Bladder: A Study in Tertiary Health Center in North Western Region of Rajasthan

Maini Deepak[1], Saraswat Anupriya[2], Singh Diksha[3], Bika Sunita[4]

[1]Final Year Resident, Dept of Pathology, Sardar Patel Medical College, Bikaner, Rajasthan
[2]First Year Resident, Dept of Pathology, Sardar Patel Medical College, Bikaner, Rajasthan
[3]Final Year Resident, Dept of Pathology, Sardar Patel Medical College, Bikaner, Rajasthan
[4]Professor, Dept of Pathology, Sardar Patel Medical College, Bikaner, Rajasthan

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Corresponding author: Dr. Diksha Singh
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Abstract

Background: Bladder cancer is the 10th most common cancer globally and ranks 17th in incidence and 19th in mortality in India. Key risk factors include advancing age, male gender, family history, tobacco use, occupational exposure, and poor socioeconomic status.

Materials and Methods: This two-year prospective study was conducted in the Department of Pathology at Sardar Patel Medical College, Bikaner, from July 2022 to July 2024. A total of 242 urinary bladder specimens—including TURBTs, biopsies, and radical cystectomies—were analyzed. Autolyzed or poorly preserved specimens were excluded.

Results: Urinary bladder lesions were most common in males aged 51–60 years. Hematuria was the leading presenting symptom. Neoplastic lesions constituted 83.06% of cases, while 16.94% were non-neoplastic. Among non-neoplastic lesions, chronic non-specific cystitis was the most frequent. Invasive high-grade urothelial carcinoma emerged as the most common neoplastic lesion, with most being muscle invasive. Divergent differentiation was noted in 9.03% of cases, predominantly squamous.

Conclusion: Urinary bladder lesions range from inflammatory to malignant, with hematuria being the most frequent symptom prompting clinical evaluation. Males were more commonly affected. High-grade invasive urothelial carcinoma was the predominant malignancy, with muscle invasion serving as a key prognostic factor. Early detection through cystoscopic biopsy is essential for accurate diagnosis and timely management.

Keywords: Bladder Lesions; TURBT; Urothelial Carcinoma.

Introduction

Cancer is a significant global health issue. Lung cancer was the most common type, accounting for 11.6% of all cancer cases diagnosed in 2018, while bladder cancer accounted for 4.5% of the cases worldwide. Social and economic inequality contributes to worse outcomes. These populations are at a higher risk of preventable cancers, poorer prognosis, and inadequate access to treatment. Bladder cancer is ranked 17th in incidence and 19th in mortality in India, with varying incidences across the population. [1] Risk factors for bladder cancer can be classified as non-modifiable such as age, gender and family history or modifiable like tobacco smoking and occupational exposure. Bladder cancer is more prevalent in males than females. [2,3,4] Smokers have a 3-4-fold increased risk of bladder cancer, accounting for 16% of fatalities in women and 31% in men. Consuming more fluids, especially water, may reduce the risk of bladder cancer.[2] The most common symptom associated with bladder lesions is painless haematuria. Neoplastic lesions are seen more frequently than the non-neoplastic lesions. Among the non-neoplastic lesions inflammatory lesions are seen more commonly. The majority of urinary tract tumors are epithelial in origin, with 90% being urothelial. Diagnosis and monitoring of bladder tumors involve cystoscopy, urine cytology, and histopathology, with histopathology being the mainstay. [3]

Aims and objectives of the study:

1. To study the histopathological features of various urinary bladder lesions received in

Pathology department of Sardar Patel Medical College.
2. To categorize the neoplastic lesions according to latest WHO classification 2022 of urinary bladder tumors.
3. To study the frequency of urinary bladder neoplasm in different age groups and sex of the patients.

Methodology

The present study was a retrospective descriptive hospital based study conducted at a tertiary care hospital in North-West Rajasthan over a period of 2 years in the Department of Pathology. Patient particulars such as age, gender and clinical history were noted. This two-year prospective study was conducted in the Department of Pathology at Sardar Patel Medical College, Bikaner, from July 2022 to July 2024. A total of 242 urinary bladder specimens—including TURBTs, biopsies, and radical cystectomies—were analyzed. Autolyzed or poorly preserved specimens were excluded. Slides were stained with H&E stain; special stains or IHC were used whenever needed. Tumors were classified as per WHO guidelines 2022 and graded accordingly. Data were analysed descriptively for spectrum evaluation.

Statistical evaluation was performed using SPSS version 25.0

Results

The study analyzed urinary bladder lesions in a population that ranged from 13 to 90 years, with the most common affected age group being 51-60 years and the least common being those under 40 years (table 1). The male predominance was found in the index study with M:F ratio being 4.9:1 (figure 1). Haematuria was the most common clinical symptom encountered (figure 2). Neoplastic lesions were more common, accounting for 83.06% of total urinary bladder lesions, followed by non-neoplastic lesions at 16.94% (table 2). Inflammatory lesions were the most common non-neoplastic lesions, with chronic non-specific cystitis being the most common accounting for 68.29% of the non-neoplastic lesions (figure 3). Benign lesions accounted for 7.46% of total neoplastic lesions, while malignant lesions accounted for 92.54%. The most common neoplastic lesion was invasive urothelial carcinoma high grade seen in 59.20% of the total neoplastic lesions (table 3). Muscle invasion was seen most commonly in invasive urothelial carcinoma high grade (figure 4). Invasive urothelial carcinomas often show divergent differentiation. Divergent differentiation was observed in 9.03% of cases, with squamous differentiation being the most common.

Table 1: Distribution of cases according to age group.

Age Group	Number Of Cases	Percentage
<= 40	21	8.68%
41-50	25	10.33%
51-60	76	31.40%
60-70	71	29.34%
>70	49	20.25%
Total	242	100%
Mean age	60.17	

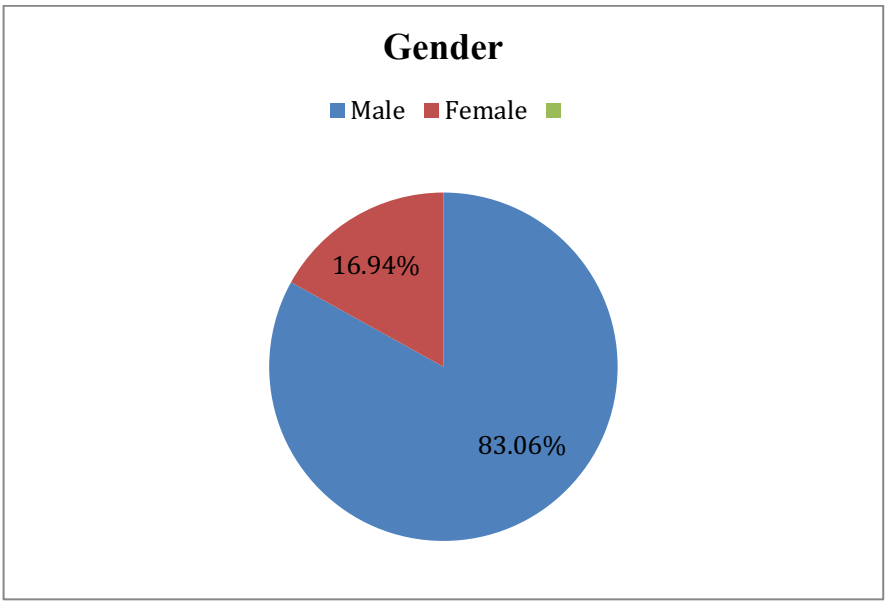

Figure 1: Distribution of total cases according to gender

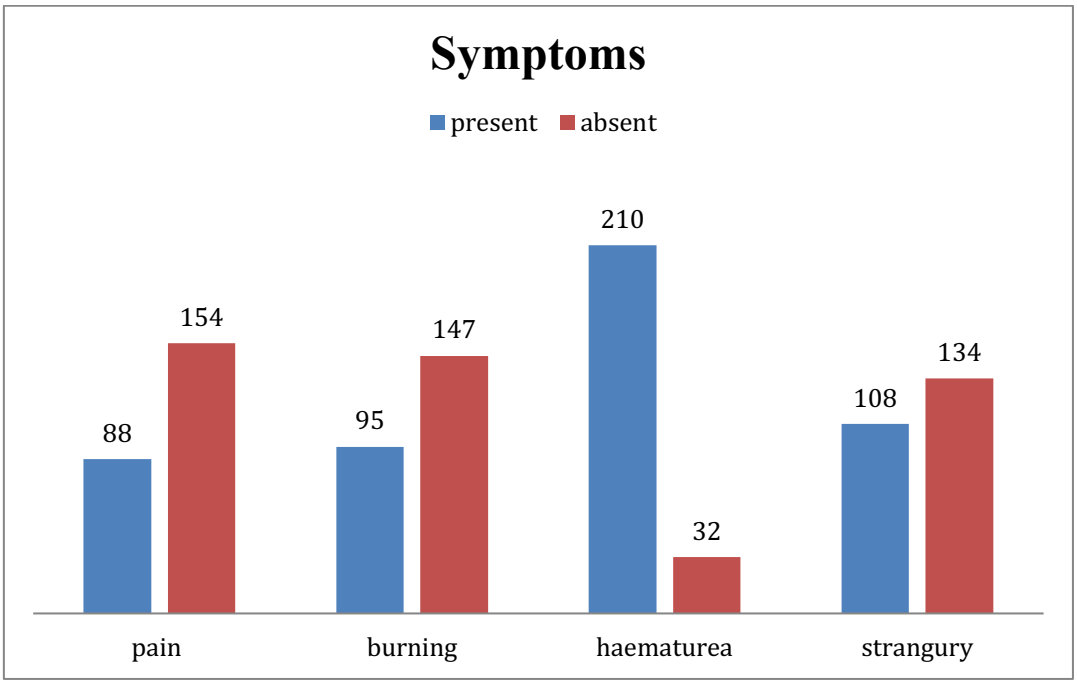

Figure 2: Distribution of cases according to symptoms

Table 2: Distribution of cases according to microscopic findings.

Distribution	Number	Percentage
Non-neoplastic	41	16.94%
Neoplastic	201	83.06%
Total	**242**	**100%**

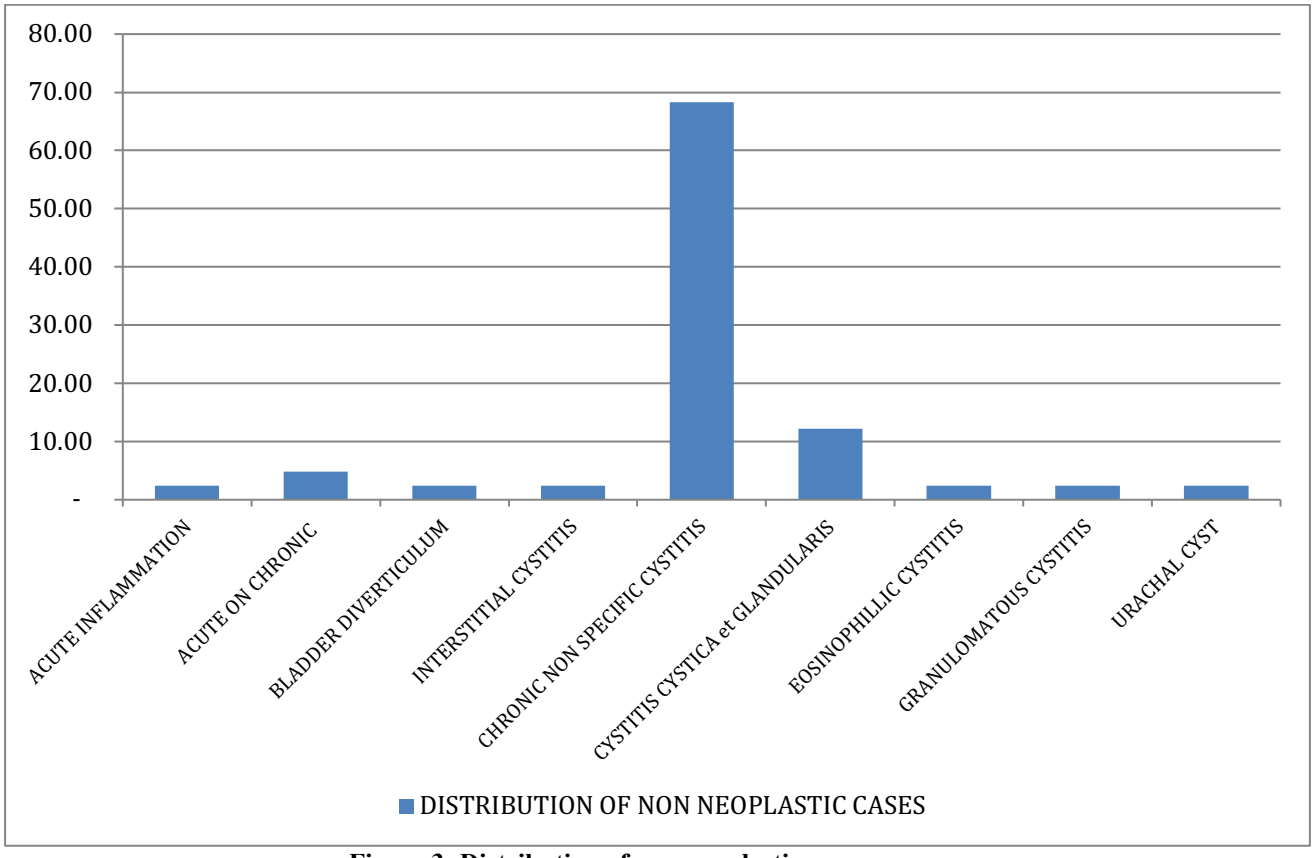

Figure 3: Distribution of non-neoplastic cases

Table 3: Distribution of neoplastic cases

Microscopic diagnosis	Number			Percentage
	Male	Female	Total	
Inverted papilloma	2	1	3	1.49%
Papilloma	1	0	1	0.50%
Benign mesenchymal neoplasm	1	0	1	0.50%
Papillary urothelial neoplasm of low malignant potential	10	0	10	4.97%
Urothelial carcinoma in situ	1	0	1	0.50%
Noninvasive papillary urothelial carcinoma low grade	9	3	12	5.97%
Noninvasive papillary urothelial carcinoma high grade	1	0	1	0.50%
Invasive urothelial carcinoma high grade	104	15	119	59.20%
Invasive urothelial carcinoma low grade	34	13	47	23.38%
Adenocarcinoma	1	0	1	0.50%
Metastatic adenocarcinoma	2	0	2	1%
Osteosarcoma	0	1	1	0.50%
Squamous cell carcinoma	1	0	1	0.50%
Undifferentiated carcinoma	1	0	1	0.50%
Total	168	33	201	100%

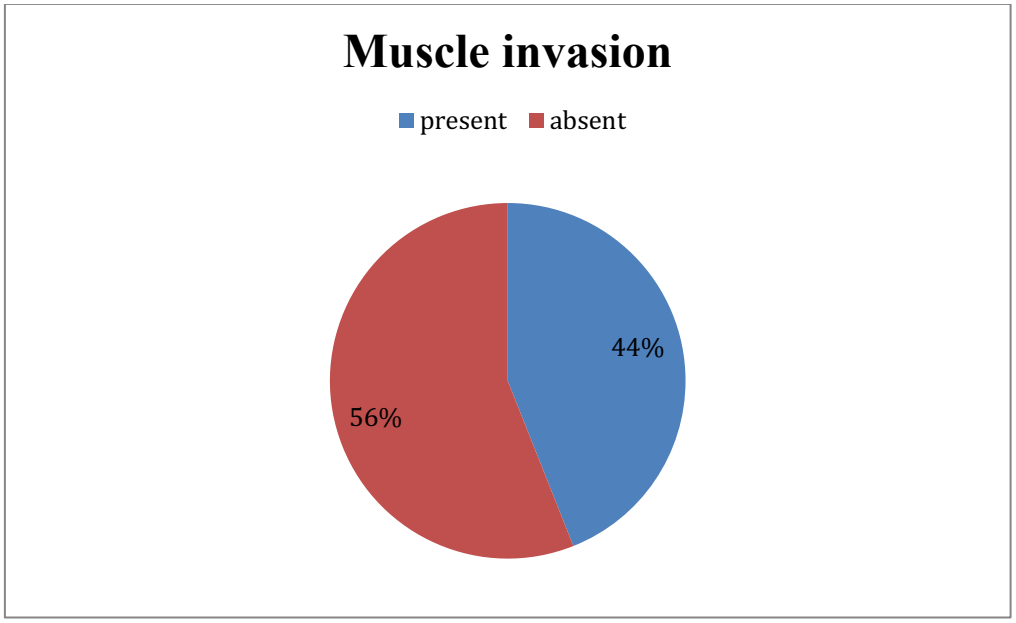

Figure 4: Presence or absence of muscle invasion in invasive urothelial carcinoma.

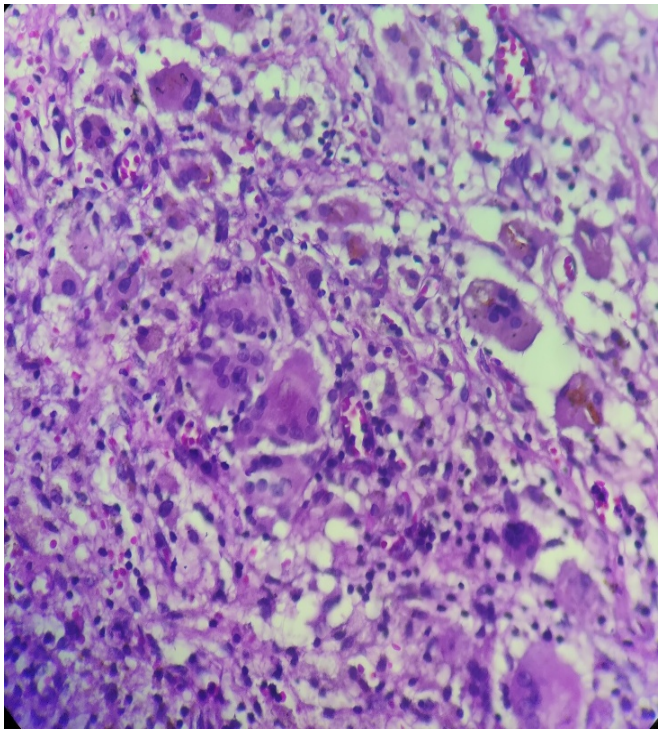

Figure 5: Granulomatous cystitis

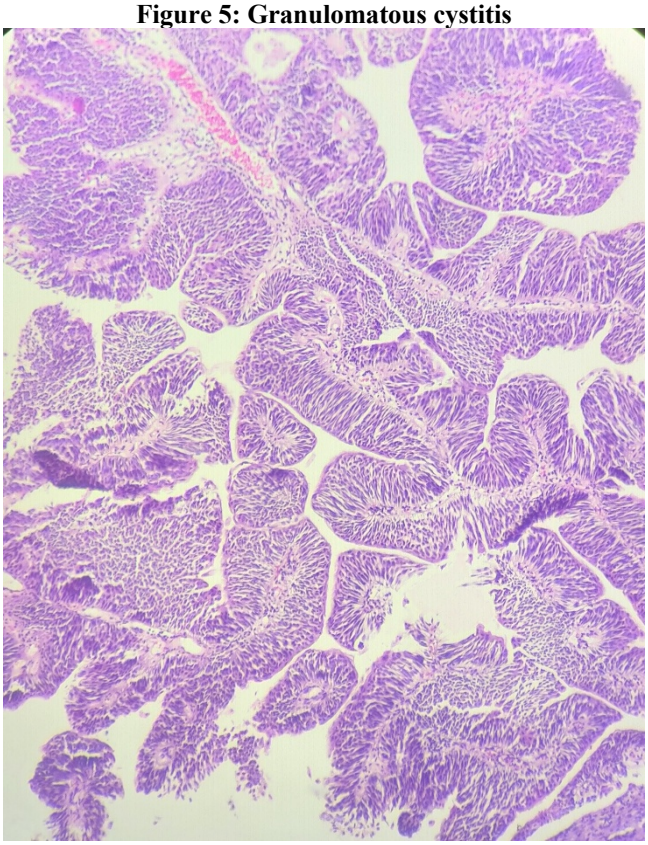

Figure 6: Low grade Invasive urothelial carcinoma

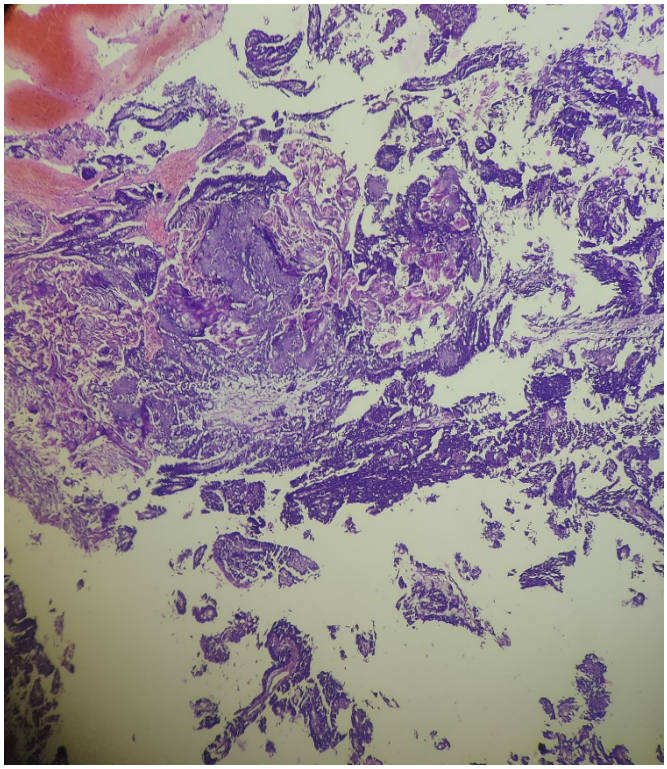

Figure 7: High grade Invasive urothelial carcinoma

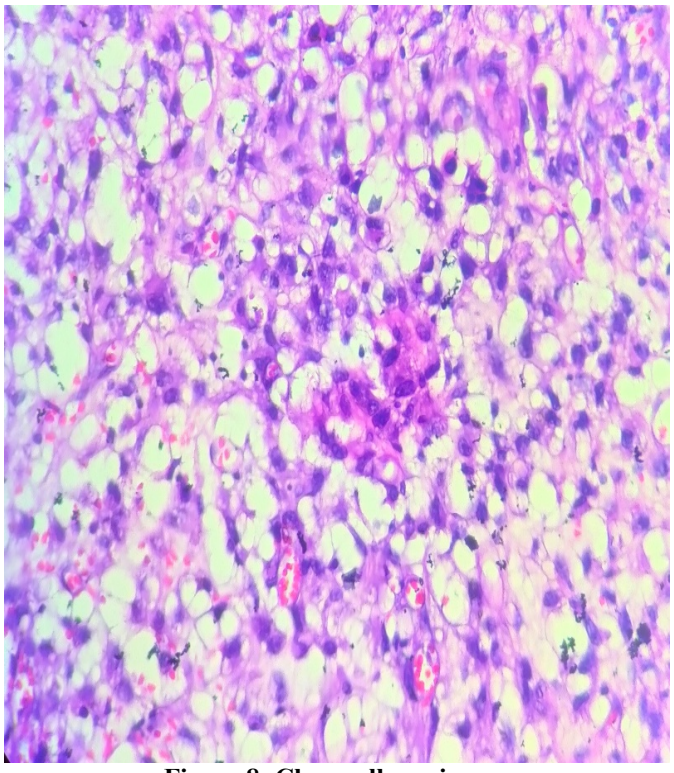

Figure 8: Clear cell carcinoma

Discussion

In the index study cases ranged from 13 to 90 years. Index study found most common age group: 51-60 years with 31.40% cases. Which was in concordance with the study conducted by Shruthi et.al. [5] and Mahesh et. al. [6] Study by Poudel et. al. [7] found most affected age group above 70 years, contradicting our findings. Discordance could be due to varied geographical locations of the studies.

Males (83.66%) were affected more than the females (16.94%). Male to Female ratio came out to be 4.9:1. Which was Consistent with previous studies done by, Shruthi et. al. [5], Mahesh et. al. [6] and Antunes

et. al. [8] where males affected were 86.4%, 71.6% and 72% respectively.

In the index study haematuria was found to be the most common clinical symptom seen in 86.77%. Which was correlated with the study conducted by Shah et. al. [9] and Pokar et. al. [10] Neoplastic lesions (83.06%) were more common than non-neoplastic lesions (16.94%). Previous studies done by Shruthi et. al. [5], Dravid et. al [11] and Shreshtha et. al [12] showed similar results.

Among Non-Neoplastic Lesions, Inflammatory lesions were more common. Chronic non-specific cystitis being the most common non-neoplastic lesion. This aligns with studies done by Shruthi et. al. [5] and Dravid et. al. [11] Study showed that among neoplastic lesions, malignant lesions were more common than the benign ones. Invasive urothelial carcinoma high grade was the most common neoplastic lesion. These findings were consistent with previous studies done by Poudel et. al. [7], Shah et. al. [9] and Pandey et. al. [13]

Muscle invasion is a crucial prognostic marker and is associated with poor prognosis. Muscle Invasion was associated more commonly with high grade tumors as compared to low grade ones. This correlated with the study done by Makwana et. al. [14] and Laishram et. al. [15]

90.97% of cases of invasive urothelial carcinoma showed no divergent differentiation. Squamous differentiation was the most common type of differentiation. Seen in 7.23% of cases. This was in concordance with previous studies done by Patil et. al. [3] and Chalise et. al. [16]

Conclusion

The study examined bladder lesions involving 242 cases. The majority of the cases were high grade invasive urothelial carcinomas, with a significant proportion occurring in men aged 51-60. Hematuria was the most common symptom, prompting further investigation by surgeons. The study highlights the rising incidence of bladder cancer globally and in India, emphasizing the importance of early detection through cystoscopic biopsies for accurate diagnosis and improved patient outcomes. The study also highlights importance of taking muscle tissue in the biopsies as muscle invasion is an important prognostic marker and is associated more commonly with high grade tumors.

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