

# A clinic-radiological study of urinary bladder tumours at tertiary health care centre

Anup Kumar<sup>1</sup>, Paramananda Taye<sup>2\*</sup>

<sup>1</sup>Sr. Consultant, Assistant Professor, Department of Radiodiagnosis, Assam Medical College and Hospital, Dibrugarh-786002, Assam, INDIA.

Email: [dr.tayepn@gmail.com](mailto:dr.tayepn@gmail.com)

## Abstract

**Background:** Urinary bladder is the most common site of cancer in genitourinary tract. Various factors have been reported to affect the risk of eventually developing urological malignancies. Computed Tomography scan is a commonly used technique for staging bladder carcinoma. **Aim:** To determine the clinico-radiological aspects of bladder tumor at a tertiary care centre. **Material and Methods:** A total of 30 patients already diagnosed and with signs and symptoms suggestive of urinary bladder carcinoma were included in the study. Signs and symptoms were recorded. Radiological imaging studies were carried out on all patients. **Results:** Majority (69.9%) of the cases were in the age group of 51-70 years. Male patients accounted for 93.3% cases and female for 6.6% cases. Most of the cases were smokers 73.3% and habitual Tea and Coffee drinking in 83.3% cases. Haematuria was the commonest presenting feature complained by 93.3% cases. The tumours showed an average attenuation value of 20-50 HU in NECT which showed heterogenous pattern of enhancement of average 21-40 HU in CECT. **Conclusion:** Carcinoma of urinary bladder is mainly a disease of the elderly. An overwhelming number of patients had history of smoking, tea drinking. Haematuria was the main presenting feature. CT scan is useful non-invasive imaging modality to detect bladder tumours and to define their location and different characteristics.

**Key Words:** Urinary bladder tumors, smoking, hematuria, Computed Tomography scan.

## \*Address for Correspondence:

Dr. Paramananda Taye, Ratanpur Path, East Milan Nagar, P.O- C R Building, Dist-Dibrugarh -786003, Assam, INDIA.

Email: [dr.tayepn@gmail.com](mailto:dr.tayepn@gmail.com)

Received Date: 19/09/2017 Revised Date: 08/10/2017 Accepted Date: 02/11/2017

DOI: <https://doi.org/10.26611/1004115>

Access this article online	
Quick Response Code:	Website: <a href="http://www.medpulse.in">www.medpulse.in</a>
	Accessed Date: 20 November 2017

## INTRODUCTION

Urinary bladder is the most common site of cancer in genitourinary tract. As per the Indian cancer registry data in men, it is the ninth most common cancer accounting for 3.9% of all cancer cases.<sup>1</sup> It is primarily a disease of the elderly people. Age, gender, and racial factors all affect the survival and prognosis of patients with bladder cancer.<sup>2</sup> A variety of factors such as occupation, alcohol consumption and smoking have been reported to affect the risk of eventually developing urological malignancies.<sup>3,4</sup> Approximately 80-90% of patients with bladder cancer present with painless gross hematuria. All patients with this classic presentation should be

considered to have bladder cancer until proof to the contrary is found. Irritative bladder symptoms such as dysuria, urgency, or frequency of urination occur in 20-30% of patients with bladder cancer.<sup>5</sup> Computed Tomography (CT) scan is a commonly used technique for staging bladder carcinoma. This information helps in decision making regarding candidates for radical cystectomy.<sup>6</sup> According to the American Urological Association guidelines, patients with asymptomatic microscopic hematuria who have no evidence of primary renal disease and in whom benign causes such as menstruation, exercise, trauma, and infection have been excluded require urologic work-up.<sup>7</sup> The guidelines recommend upper tract imaging evaluation with computed tomography (CT) or excretory urography and bladder evaluation with cystoscopy. There is significant overlap in the clinical features and radiologic findings of bladder tumors. However, there are some tumors with more specific findings, which may help direct the clinical evaluation. Therefore, this present study was done to determine the clinico-radiological aspects of bladder tumor at a tertiary care centre.

## MATERIAL AND METHODS

The present study was conducted in the Department of Radiology, Assam Medical College and Hospital, Dibrugarh, over a period of two years on 30 cases of urinary bladder carcinoma. Patients with signs and symptoms suggestive of urinary bladder carcinoma and already diagnosed by cystoscopic examination were included in the study. Known cases of urinary bladder carcinoma referred to Department of Radiology were also included. The present study was time bound and observations, different investigations its interpretations and analysis were made personally; with verification by competent guides. Detailed history regarding occupation and personal habits such as smoking, tea or coffee consumption was taken. Signs and symptoms were recorded. General and systemic examination was done.

**Imaging Ultrasonography:** The patients were kept on empty stomach for at least 6 hours before the examination. The urinary bladder was examined in the distended state. Real time B-mode ultrasonography was done with a SIEMENS-SONOLINE-ADARA Real Time Scanner with a 3.5 MHz transducer. Routine transverse and sagittal scanning was performed with the patient in the supine position. Patients were then rescanned in both right and left posterior oblique positions. Apart from the bladder and prostate, the entire abdomen was also scanned to look for any added pathology.

**Computed Tomography:** Somatom AR.TX (SIEMENS, Germany) CT scanner was used. Adequate opacification of small and large bowel is done by an oral contrast agent (10 ml of water soluble iodine based agent diluted in 200 ml of water) 6–12 hours before the study to ensure good colonic opacification. An additional 1 litre of water mixed with 10 ml of iodine based contrast is given over 1 hour prior to CT study for opacification of small bowel. Just before examination 100 ml of diluted contrast agent is

given for opacification of rectum or in some cases air is insufflated into the rectum. Upper abdominal scans were taken with 10 mm of slice thickness at 10 mm intervals up to the iliac crest. Pelvic scan was taken in contiguous 5 mm slices. Both plain and contrast enhanced CT scans were obtained. About 100 ml of nonionic contrast medium was injected intravenously as a bolus dose to image the pelvis and another 50 ml was given for abdominal scans. Delayed scans after 10–15 minutes were also taken in the pelvis. The examination was performed in well distended bladder. However, overdistension of the bladder was avoided for better delineation of peripelvic fat and anterior abdominal wall.

**Intravenous Urography:** IVU was performed in 20 cases with ionic or non-ionic contrast medium. Full length films including the renal, ureters and bladder area were taken. Both full bladder and post void films were taken.

**Routine ChestX-Ray:** It was done to rule out secondaries and to help in staging.

**Cystoscopy:** Cystoscopy examination was performed in all cases. Biopsy was performed in all cases and transurethral resection was performed in almost all cases.

## RESULTS

Maximum number of cases were in 51-60 years -11 cases (36.6%) followed by 61-70 years - 10 cases (33.3%). The incidence rate in female was negligible. There were 2 women out of 30 patients. Males accounted for 28 (93.3%) cases and female accounted for 2 (6.7%) cases. Most of the patients were from lower socioeconomic status. Out of 30 patients 18 (60%) were farmer, 5 (16.7%) were labourer and 3 (10%) were electrician. The major risk factor associated were intake of tea and coffee - 25 (83.3%) cases and smoking 22 (73.3%) cases.

**Table 1:** Distribution of patient characteristics

	No. of patients
<b>Age group</b>	
< 40	03
41-50	05
51-60	11
61-70	10
71-80	01
<b>Sex</b>	
Male	28
Female	02
<b>Occupation</b>	
Farmer/Cultivator	18
Labourer	05
Accountant	01
School teacher	01
Electrician	03
Housewife	02

Risk factors	
Smoking	22
Tea / coffee	25
Cystitis	10
NSAIDs	04

Hematuria was the commonest symptom complained by 28 cases (93.3%) followed by increased frequency 11 cases (36.6%) and dysuria 10 cases (33.3%).

**Table 2:** Clinical presentation of study population

Symptoms	No. of Cases	Percentage
Haematuria	28	93.3
Dysuria	10	33.3
Obstruction to Flow	6	20.0
Frequency	11	36.7
Lump abdomen	3	10.0
Pain	5	16.7

Posterolateral wall was involved in maximum number of cases (15 cases, 50%) followed by base and trigone 6 (20%) cases each. Out of 30 cases of bladder mass in our study there were 18 (60%) cases showed attenuation value of 31-40 H.U. followed by 41-50 H.U. in 6 (20%) cases. 15 cases (50%) showed 31-40 H.U. contrast enhancement immediately after contrast injection followed by 10 cases (33.3%) which shows enhancement of 21-30 H.U. Spread to adjacent organ was maximum in the prostate 2 (6.7%) cases, rectum 1 (3.3%) case and uterus 1 (3.3%) case.

**Table 3:** CT scan characteristics

Attenuation values		No. of patients
20-30		04
31-40		18
41-50		06
51-60		02
Enhancement pattern		
10-20		05
21-30		10
31-40		15

All the cases of metastases, 5 cases of lymphnode involvement, 3 cases of adjacent organ involvement and 2 cases of pelvic and abdominal wall involvement and Grade-III tumours. Most of cases of perivesical spread were Grade-II and tumour limited to U.B. wall were Grade-I tumour.

**Table 4:** Extent of involvement by the tumor with grading

Extent	No. of Cases	Percentage (%)	Tumor Grade		
			I	II	III
U.B. Wall	6	20.0	6	-	-
Perivesical Spread	15	50.0	4	7	2
Pelvic and Abdominal Wall	3	10.0	-	1	2
Adjacent Organ	4	13.3	-	1	3
Lymphnode	6	20.0	-	1	5
Metastases	5	16.6	-	-	5

## DISCUSSION

Age incidence as prime epidemiological factor for carcinoma of urinary bladder is universally accepted to be a disease of the elderly. In Yang's study<sup>8</sup> in China and Akbarzadeh Pasha in Mazandaran province of Iran,<sup>9</sup> the most frequency of bladder cancer was observed in the age group 60-79 and 70-84 years, respectively. In various studies, the average age of bladder cancer incidence was reported in 65-70 years.<sup>10</sup> The incidence of carcinoma of

urinary bladder in male is quite high with negligible incidence amongst female in different studies. In our study of 30 cases of bladder tumour, 28 (93.3%) cases were male and 2 (6.6%) cases were female. Men are three to four times more likely to develop urothelial carcinoma of bladder than women.<sup>11</sup> The incidence and severity of diseases vary between the genders and may be related to differences in carcinogenic exposures, enzymatic processing of environmental substances, and cellular and

physiologic responses.<sup>12</sup> In the present study maximum number of patient were farmers (18 cases, 60%). There is a well-documented causal link between urothelial cancer and a variety of occupational and environmental chemicals, including beta-naphthylamines (such as 2-naphthylamine, 4-aminobiphenyl, and benzidine).<sup>13</sup> In our study cigarette smoking was associated with 73.3% of cases. Cigarette smoking is the most important risk factor for urothelial bladder carcinoma, accounting for 50% of cases in men and 35% in women.<sup>12</sup> A meta-analysis reported that current cigarette smokers have a risk of 2.57 (95% confidence interval (CI) 2.20–3.00) compared with nonsmokers.<sup>12</sup> Coffee and Tea drinking were major associated risk factors in our study accounting for 83.3% of the cases. A recent meta-analysis has not found any association between tea consumption and urothelial carcinoma.<sup>14</sup> Singh JP *et al* study found 87.8% of patient had history of tea and coffee intake with a significant associated risk factor (*P*-value 0.035).<sup>15</sup> In our present study the most common clinical presentation was hematuria complained by 28 cases out of total 30 cases comprising of 93.3%. Typically, the majority of patients with bladder cancer present with gross painless hematuria, with estimates of this presentation accounting for up to 85% of patients at initial diagnosis.<sup>16,17</sup> In our study of 30 cases of bladder tumour there were 73.3% of cases had attenuation values between 20–40 HU. This correlates with study by Vock *et al* (30-50 HU).<sup>18</sup> CT has been reported to be of value in staging of bladder tumors by indicating the extent of growth in bladder wall and adjacent tissues. In conclusion, this study has shown that carcinoma of urinary bladder is mainly a disease of the elderly and mostly belong to lower socio-economic group. An overwhelming number of patients had history of smoking, tea drinking and is strongly suggestive of having some causal association with the disease. Haematuria was the main presenting feature followed by Irritative bladder symptoms. Computed tomography is useful non-invasive imaging modality to detect bladder tumours and to define their location and different characteristics.

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Source of Support: None Declared  
Conflict of Interest: None Declared