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Research Article

Histopathological Study TURBT Biopsies of Urinary Bladder Cancer

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Abstract

Background and Objective: Bladder cancer is a major health problem especially among men. The present study was conducted to determine the histopathological features of urinary bladder cancer with reference to age, sex and metastasis (muscle invasion). **Materials and Methods:** From 2014-2016, the records of 51 patients who were diagnosed and confirmed the urinary bladder cancer in Vedhanayagam Hospital, Coimbatore were included in the study. Their clinical databases such as age, sex, clinical features etc were collected from the hospital. **Results:** The present study reveals as most of the cases were of TCC (transitional cell carcinoma) and male to female ratio is 3.6:1 and among 38 cases only 18 cases, muscle were included for the study and with the progression of age, the number of low grade cases are less compared to high grade cases. **Conclusion:** Urinary bladder cancer is not very rare now a days and its incidence peaks in men are at the age after 50. In Indian population, the diagnosed bladder cancer is predominantly TCC and male dominance is observed much.

Key words: TCC, bladder cancer, metastasis, muscle invasion, progression

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Bladder cancer is one of the most common urological malignancy and encountered in clinical practice^{1,2}. In South Asia, reported rate of bladder cancer was about 2.1 per 100,000³. It is the second most common malignancy of the genitourinary tract after the prostate cancer and represents a heterogeneous group of neoplasms⁴. In an Indian study, genitourinary cancers (20.79%) are the most common cancer in both sexes⁵. As per the Indian cancer registry data, in men, it is the 9th most common cancer accounting for 3.9% of all cancers¹. Bladder cancer is more common in men than in women with a male to female ratio of 3 to 4.1; however in women it was diagnosed at a more advanced stage and has higher mortality than in men⁵. Bladder cancer is strongly associated with exposure to smoking, environmental toxins and aging and peaks in prevalence and incidence in the 8th decade of life⁶.

The spectrum of bladder cancer is diverse, but majority (nearly 90%) are transitional tumors. The other tumors are squamous cell carcinoma, adenocarcinoma and rare varieties like small cell carcinoma³. 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. Asymptomatic microhematuria is the next common presenting symptom for bladder cancer with up to 10% of patients evaluated for the presence of hematuria being diagnosed with bladder cancer⁶.

The clinical significance of bladder tumor depends upon their histological grade differentiation and most importantly on the depth of invasion of these lesions⁴. Cytoscopy is the primary diagnostic tool for the patients of bladder tumors. TURBT procedure ensures the material necessary for histopathological diagnosis, it allows the assessment of the degree of differentiation, depth of invasion, parameters which are useful in elaboration of diagnosis and prognosis assessment. Pathological stage is the most important determinant of prognosis and treatment^{7,8}.

The present study was conducted to analyze the histopathological features of various lesions of urinary bladder and study the relationship between ages, sex incidence of tumor occurrence and to correlate with stage and grade and metastasis (muscle invasion).

MATERIALS AND METHODS

This is a retrospective study done at Vedhanayagam Hospital, Coimbatore for a period of 2014-2016. During

this period, the patients who underwent the TURBT were taken in to the study.

Inclusion criteria: The patients who have diagnosed histopathologically to have urinary bladder cancer have been included in the study.

Exclusion criteria: The patients who have not diagnosed histopathologically and those with no adequate information have been excluded from the study.

Based on the above criteria, the study group includes a total of 51 patients who were confirmed with diagnosis. Before the study, the patients were explained and a written consent was taken. The study was approved by the Institutional Ethical Committee Board.

TURBT was performed using glycine (1.5%) as an irrigant. A deep biopsy was taken separately to include detrusor muscle. Biopsies were fixed in 10% formalin solution before being processed manually and automatic tissue processor. After embedding in paraffin blocks, several thin sections of 2-3 μ m thickness were cut from each block. The sections were stained with hematoxylin and eosin stains for routine histological diagnosis. During histological analysis, the samples were evaluated based on papillary configuration, cytological characteristics, invasion of lamina propria and muscle inflammation, schistosomal lesions, metaplasia, dysplasia and to the urothelial neoplasms were then graded according to New WHO/ISUP⁹.

For the analyzed patients, their clinicopathological data were extracted from the reports such as age, sex, gender, presenting symptoms, nature of specimen and gross histological appearance of tumor.

RESULTS

A total of 51 cases of urothelial tumors of the bladder were included for the study of the age group from 31-80 years which includes 40 males and 11 females with the male to female ratio as 3.6:1. The majority of the cases were in the 7th decade of life followed by 6th and 8th decade of life. 5th and 4th decade life had few cases only. No cases were seen in the age below 30 years.

Among 51 cases, 38 were transitional cell carcinoma (TCC), 5 squamous carcinoma, 6 PUNLMP and 2 adenocarcinoma were reported. In 38 TCC cases, 22 cases of low grade and 16 high grade cases were been identified. Among 22 low grade cases, 21 low-grade non-invasive papillary urothelial carcinoma were identified

Table 1: Frequency of pathological lesions with age and gender

Diagnosis	Age group									
	31-40 years		41-50 years		51-60 years		61-70 years		71-80 years	
	Male	Female								
Low grade	2	-	3	-	2	5	6	1	3	-
High grade	-	-	-	-	1	-	7		5	3
Adenocarcinoma					2					
PUNLMP					3			2	1	
Squamous					2		3			

microscopically, which had shown lamina propria invasion with increased layering of cells, moderate degree of pleomorphism and low mitotic rate. In 21 cases, 15 were of males and 6 of females. In most of the cases, the affected age group was 61-70 years in males and 51-60 years in females (Table 1).

Among the 16 high grade cases, 13 cases were reported as high grade non-invasive papillary urothelial carcinoma with complete loss of polarity, marked degree of pleomorphism, distinct nucleolus and with increased rate of mitosis. In 13 cases, 10 were males and 3 were females. The most affected age group in males were 61-70 years, while in females it was in 71-80 years.

Five cases of invasive transitional cell carcinoma was found. This study compared gender and muscle invasion in the cases and found as one case in low grade and 4 cases in case of high grade.

Among 22 low grade cases, only 6 cases, muscles were included in the study, rest 16 cases muscle were not included in the study. Similarly out of 16 cases of high grade tumor, 12 cases muscles were included in the study and 4 cases muscles were not included for the study. So out of 38 cases, a total of 18 cases muscle invasion been studied and in the rest cases the muscle were not included.

DISCUSSION

Bladder cancer is more common in elderly males. The incidence of bladder cancer have marked geographic and clinicopathological variation worldwide and the carcinoma cases rises progressively with a peak incidence in 6th and 7th decade of life and males were more commonly affected than females. The male-female ratio in different parts of the world is varied. It was less than three in India, Thailand and US black¹⁰. The male to female ratio in this study was 3.6:1 and which was correlated with Pudasaini *et al.*⁸ (3.5:1) and was lower than Laisharam *et al.*⁷ (4.7:1) and higher than Volkan sen *et al.*¹⁰ (1.5:1) and also goes with Gupta *et al.*¹ states as male preponderance was more common in

Indians than in other races. TCC is the most common cancer of urinary bladder. The present study result shows that urothelial carcinomas are more common (74.5%) among the other carcinomas of urinary bladder cancers in this study which is nearly correlated with the study of Goyal VK *et al.*¹¹ (96.87%).

From this study, it is shown as the low grade urothelial carcinomas (22 cases) are more compared to the incidence of high grade carcinomas (16 cases). These findings go with the findings of Koyuncher *et al.*¹² as 85 cases for low grade and 40 cases for high grade. The study indicates that the incidence of low grade tumors are more in males (16 cases) than in females (6 cases) with the incidence peak is in the age group of 61-70 years in case of males and 51-60 in case of females. Also the study reveals, the high grade tumors were more common in males compared to females. In this study, 13 cases of males are observed with high grade tumor whereas only 3 cases of females with high grade tumor. Among males, the high grade tumors are of peak in the age group of 61-70 (7 cases) and with 5 cases in the age group of 71-80 which goes with the study of Panchal Jaimin *et al.*¹³, as the proportion of late stage tumors are significantly lower in the screening-detected bladder cancer compared to the unscreened ones. In contrast to the studies done in South East Asian countries and Western countries, this study shows the presence of five cases of squamous cell carcinoma among the cases taken for study and the number of PUNLMP cases was 6 out of the study cases and this is of more compared to the findings of Shah *et al.*¹⁴ as 2 cases for squamous and 3 cases of PUNLMP.

With increase of age, the number of low grade cases decreases and high grade cases more reveal the possibility of muscle invasion. In this study, in 6th and 7th decade, the number of low grade cases as 7 in each and one case of high grade in 6th decade and 7 cases in 7th decade of life span and this findings goes with Volkan Sen *et al.*¹⁰ 2016. There were 2 low grade cases been reported in our study in the 4th decade of life and this goes with the reports of Wan *et al.*⁵. This puts a contrast with the common belief that

the behaviour of cancer is more aggressive in younger groups. So more research will be needed to reveal the reasons behind this. Pathological grade and muscle invasiveness are the most valuable prognostic predictors of survival. Out of 38 cases, only in 18 cases muscle invasion was examined that is 6 cases in low grade and 12 cases in high grade were reported. Invasion to the muscle layer correlates with the high grade tumor. Not including the muscle layer in the biopsy specimen may lead to understaging in many patients. So the importance of including smooth muscle in the biopsy specimens needs to be emphasized.

CONCLUSION

Genitourinary tumors are commonly encountered in clinical practice. The study on urinary bladder cancer by Indian researchers is recognized internationally. Urinary bladder cancer is not very rare now a days and its incidence peaks in men at the age after 50. In Indian population, the diagnosed bladder cancer is predominantly TCC and male dominance too observed. Most of the tumors are non-invasive at the time of diagnosis. Younger patients present with low grade tumors. Early diagnosis is more important in the diagnosis of urinary bladder cancer. Grading and staging are the two factors which are more helpful in the prognosis and planning for treatment options for bladder cancer patients. There is a definite correlation between muscle invasion and tumour advancing. Negligence of including the muscle layer may lead to understaging of tumour so the importance of muscle layer inclusion to be emphasized.

SIGNIFICANCE STATEMENT

This study emphasizes the importance of inclusion of muscle in biopsy to determine the stage and grade of tumors.

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