

PREVALENCE OF SARCOMATOID CARCINOMA OF URINARY BLADDER IN NORTH WEST RAJASTHAN: A FIVE YEARS RETROSPECTIVE STUDY AT OUR INSTITUTE

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Abstract

Background: Sarcomatoid carcinoma is an uncommon malignancy, represents only 0.1% to 0.3% of carcinomas.

Methods: The medical records of all the patients who underwent consecutive cystectomy and the TURBT specimen sent to pathology department of Sardar Patel Medical College, Bikaner, were retrospectively analysed. Detailed medical history was noted age, gender, indication for surgery, surgical procedure, tumour localization in the urinary bladder, diameter of the lesion after fixation with 10% formalin, and overall incidence of tumour reviewed in detail.

Results: Out of the total 541 patients, 41 were found to have histological evidence of benign lesions of the urinary bladder, hence not included in the study. Out of 500 patients of urinary carcinoma 1 patient was found to have histological evidence of sarcomatoid carcinoma which was further confirmed by immunohistochemistry. The patient was 29 years old male. Gross haematuria was the clinical presentation. Radical cystectomy was performed. The tumour was polypoid, located on left posterolateral wall of the bladder with dimension of 10X7X6 cm.

Conclusion: Sarcomatoid carcinoma is a rare variant with different therapeutic and diagnostic implications, presenting with gross haematuria. Sarcomatoid carcinoma was diagnosed on histological and immunohistological staining.

Introduction

Transitional cell carcinoma is the most prevalent bladder neoplasm. Non-urothelial bladder tumors frequently present a challenge and may not be encountered within a lifetime of practicing urology.¹

Bladder cancer is a significant health problem with increasing incidence in parallel with the growing prevalence of tobacco smoking worldwide. It is the ninth most common cancer in the world and ranks second among all types of cancer in the urinary tract. Besides, clinical studies showed that more than 100,000 patients were diagnosed with a muscle-invasive or advanced disease each year around the globe.^{2,3}

Originally described by Dent in 1955, sarcomatoid Urinary carcinoma was originally termed carcinosarcoma because of the combination of both epithelial- and mesenchymal-type components.⁴⁻⁶

More recently, the term sarcomatoid carcinoma has been applied to this neoplasm, as the sarcomatoid features appear to be derived from dedifferentiation of the carcinomatous component.⁷

One of the major challenges in the diagnosis of sarcomatoid UCa is its broad morphologic spectrum, which often raises a differential diagnosis that includes true mesenchymal neoplasms.⁸

Several investigators evaluated clonality in both malignant epithelial and mesenchymal elements using genetics or molecular techniques. The tumor cells from both tumor components showed monoclonality and clonal identity in all cases studied, suggesting a monoclonal origin.⁹

In most cases, the epithelial component consists of high grade transitional cell carcinoma with possible epidermoid and/or glandular differentiation, while the heterologous component consists of chondrosarcoma, malignant fibrous histiocytoma, osteosarcoma, leiomyosarcoma, fibrosarcoma, or rhabdomyosarcoma.¹⁰

Clinically, carcinosarcomas occur more commonly in older males, and present as advanced stage, rapidly growing polypoid neoplasms.^{11,12}

The epithelial elements react with cytokeratin or epithelial membranous antigen, whereas the stromal elements react with vimentin, actin, or specific biomarkers. Sarcomatoid-variant urothelial carcinoma has a very poor prognosis compared with other types, due to the aggressive nature of this neoplasm. Pathological stage is the best predictor of survival in sarcomatoid variants.⁸

Good prognostic factors include negative surgical margins and absence of metastatic disease at the initial presentation. At 2-year mortality is almost 70%.

Appropriate treatment has not yet been defined. However, the aggressive behavior of the tumor precludes radical

therapy whenever possible, since adjuvant therapy seems to have little effect. Total cystectomy often followed by radiation therapy and/or chemotherapy seems to be the preferred treatment.

The aim of the present study is to determine the prevalence of sarcomatoid variant of bladder cancer and to compare the prevalence in our region with global and national literature at Sardar Patel Medical College and Associated Groups of Hospitals.

Methods

This study is a retrospective study conducted at the Department of Pathology, Sardar Patel Medical College and associate group of hospitals, Bikaner, Rajasthan over the period of five years from September 2015 to August 2020. PBM and associated hospitals is the largest tertiary care teaching hospital in Bikaner region of North West Rajasthan, and the departments of Pathology receive tissue samples from PBM hospital and other government and private hospitals in the zone. We report here the incidence of sarcomatoid variant of bladder cancer at a single centre and compared the experience with the recent available literature on this subject.

All radical cystectomy specimens along with TURBT chips received at the department of pathology during the study period were included in the study. The clinical and other relevant data was recorded from the requisition form. Gross examination was done and findings recorded. All the specimens were fixed in 10% formalin. All sections were stained with hematoxylin and eosin and examined under the light microscope. Immunohistochemical staining was done.

Results:

We received a total of 541 specimens of radical cystectomy and TURBT chips during the study period. Out of these 541

patients, 41 patients were found to have histological evidence of benign conditions of bladder which were excluded from the study. 500 patients were diagnosed having urothelial carcinoma. Out of 500 patients of urothelial carcinoma, 1 patient (0.2%) [Table 1] was found to have histological evidence of sarcomatoid variant of urothelial carcinoma, which was further confirmed by immunohisto-chemistry. The patient was 29 year male. The patient presented with the symptoms of gross haematuria, flank pain.

USG whole abdomen revealed a large heterogenous solid urinary bladder mass lesion with left hydronephrosis and hydroureter.

CECT whole abdomen showed large enhancing (10X7.5 cm) mass attached to left posterolateral wall and occupying most of the bladder lumen obliterating the left ureteric opening.

Radical cystectomy was performed in the patient. Grossly, a grey white tumor was located in left posterolateral wall [Figure. 1] measuring 10X7X6 cm.

The clinicopathological data in relation to sarcomatoid variant of urinary bladder carcinoma is shown in Table 2. [Table 2] The histopathological features of sarcomatoid variant of urinary bladder carcinoma are shown in images, first image is high power view H&E (x400) [Figure. 2] showing interlacing fascicles of spindle cells with variable amount of eosinophilic cytoplasm and round to oval cells having mild to marked nuclear atypia. Histopathology also showed haemorrhage, necrosis, inflammatory cellular exudate and few tumor giant cells. Immunohistochemistry studies revealed CK (AE1/AE3) positive, [Figure. 3] GATA3 (L 50-823) positive, [Figure. 4] S100 (EP 32) patchy positive, SMA (1A4) focal positive, Desmin negative, Ki-67 (MIB-1) 60% , P63 negative, Uroplakin negative, CD138 negative CD34 negative and HMB45 negative.

Table 1: Summary of present study showing prevalence of sarcomatoid variant of urinary bladder at our institute.

Study Period	Total cases studied	No. of sarcomatoid carcinoma	Prevalence
From September 2015 to August 2020	500	1	0.2%

Table 2: Clinicopathological characteristics of patient with sarcomatoid variant of urinary bladder.

Patient no.	Age (Years)	Gender	Presenting complaints	Tumor size (Cm.)	Tumor location	Tumor extent
1	29	Male	Gross haematuria, flank pain	10 X7 X6	Left posterolateral wall	Perivesical fat



Figure 1: Distorted specimen of Cystectomy showing grey white solid tumor.

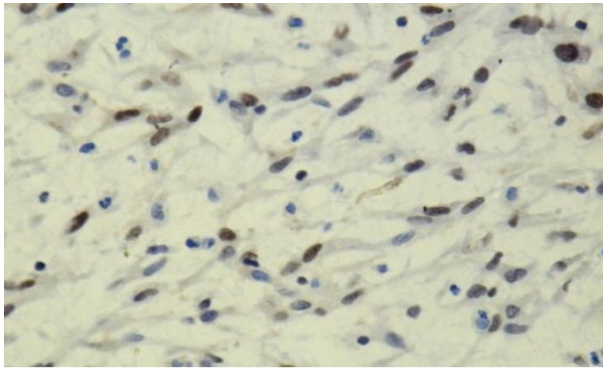


Figure 2: Immunostain GATA-3 positivity

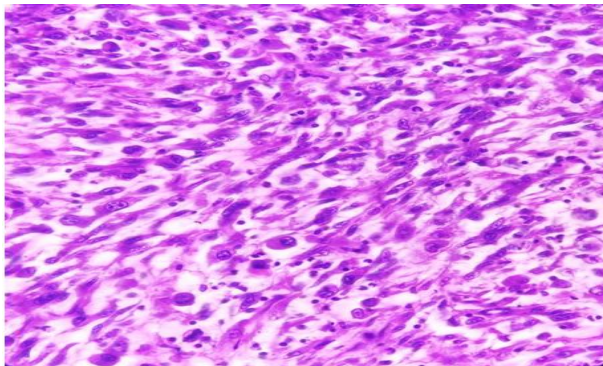


Figure 2: High power view H&E (x400) showing mainly interlacing fascicles of spindle cells with round to oval cells.

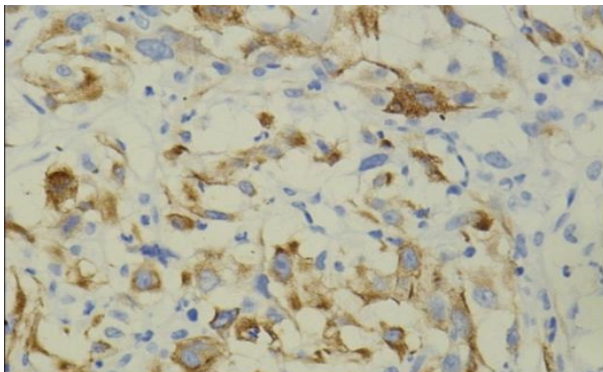


Figure 4: Immunostain CK positivity

Discussion:

The term sarcomatoid variant of urothelial carcinoma should be used for all biphasic malignant neoplasms exhibiting evidence of epithelial and mesenchymal differentiation, with the presence or absence of heterologous elements.¹³

It most commonly affects white elderly male patients in their seventh decade of life. The risk factors are the same for usual urothelial carcinoma. Radiotherapy or cyclophosphamide has been reported as specific risk factors.¹⁴

Sarcomatoid carcinoma can be seen in many different parts of the body such as the genital system, thymus, skin, breast, spleen, pancreas, peritoneum and upper and lower respiratory system. However, the most common organ involved is the uterus in postmenopausal women, and the bladder in men.¹⁵

Symptomatology in sarcomatoid cancers of the bladder is very similar to the transitional cell tumors frequently observed in the bladder. As the macroscopic hematuria is the main complaint, the recurrent urinary tract infections, suprapubic pain, and dysuria are the other signs and symptoms.¹⁶ Similarly, the main symptom was macroscopic hematuria in our case. There are many factors strongly associated with sarcomatoid cancer of the bladder such as smoking, radiation exposure, cyclophosphamide use, and recurrent cystitis.¹⁷ The patient discussed in this report had a history of heavy smoking. Patient had no history of radiation or intravesical cyclophosphamide chemotherapy.

Previous studies showed that tumor diameters were highly variable.

The prevalence of sarcomatoid variant of urinary bladder in our database is 0.2%, which corresponds the available international literature; Unusual is the age of the patient at the presentation.

The predominant location of the sarcomatoid carcinoma was the bladder base, including the trigon and the lateral walls of the bladder. In the present case, the tumor was located in the left posterolateral wall.

Most tumors presented as polypoid or large broadly based mass with ulceration and extension into the muscular layer.

Histologically, the tumor may show a mixture of carcinomatous and sarcomatoid components in varying ratios, but the sarcomatoid component always occupies more than 50% of the tumor area.⁸

The epithelial component can be in the form of TCC, squamous cell carcinoma, adenocarcinoma, small cell carcinoma or overlying carcinoma in situ. The immunohistochemical profile of the sarcomatoid variant of

TCC includes positivity for epithelial markers, at least focally, including cytokeratin and epithelial membrane antigen. This distinguishes this entity from pure sarcomas.¹⁸

Radical cystectomy with pelvic lymphadenectomy is the mainstay of treatment, although patients tend to develop local recurrence after surgery.

We compared the findings of this study with the available literature from other parts of India and South East Asia [Table 3]. The literature about the subject is extremely limited, the prevalence of sarcomatoid variant of urinary bladder carcinoma reported between 0.1% to 0.3% in different studies conducted in different institutes in India. Wang *et al.* presented SEER databases, which included 221 patients, between 1973 and 2004, this accounted for approximately 0.11% of all primary bladder tumors during the study period.¹⁹

Erdemir *et al.* evaluated 159 patients who underwent radical cystectomy in their department and found that only 0.031% of them had sarcomatoid cancer.¹⁵

We reported the incidence of 0.2% of all Urothelial carcinoma at our institute, during the study period.

Table 3: Comparison of present study with previous studies

S. No.	Name of Study	Year of Study	Total Cases	Prevalence
1	Wang <i>et al</i>	1973-2004	221	0.11%
2	Erdemir <i>et al</i>	2006	159	0.031%
3	Present Study	2015-2020	500	0.2%

Conclusion

Sarcomatoid carcinoma is a rare variant with different therapeutic and diagnostic implications. In summary, carcinosarcoma of the urinary bladder is a

highly malignant neoplasm. Histopathology and immunohistochemistry play an important role in establishing the diagnosis and hence guiding the further management. Future advances in the molecular biology of this disease may lead to development of novel treatment strategies for this relatively rare but complex disease.

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