Acute Kidney Injury after Ureteral Obstruction Due to Signet Ring Cell Adenocarcinoma of the Bladder

Abstract

Background and objectives: Acute Kidney Injury (AKI) due to bilateral ureteral obstruction in older patients typically raises concerns of abdominal, retroperitoneal, or pelvic neoplasms. Aim of the present paper is to analyse the acute kidney injury after ureteral obstruction due to signet ring cell adenocarcinoma of the bladder. **Material and methods:** This descriptive clinical study was conducted in Lahore General Hospital, Lahore during January 2019 to November 2019. The data was collected from 10 patients of age range 40 to 60 years. This data include mainly male patients. These selected patients started with hematuria complaint, associated with left flank pain of intensity 8/10 and abrupt onset during his work. **Results:** The data was collected from 10 patients of AKI after Ureteral Obstruction Due to Signet Ring Cell Adenocarcinoma of the Bladder. The mean age of the patients was 56.56±8.46 years. The BMI of the selected patients was 24.31±2.26 kg/m^2 and all basic values are presented in table 01. **Conclusion:** It is concluded that adenocarcinoma is a rare type of bladder cancer, with the subtype signet ring cell adenocarcinoma even rarer.

Key words: Adenocarcinoma, Cancer, Signet ring cell

Introduction

Acute Kidney Injury (AKI) due to bilateral ureteral obstruction in older patients typically raises concerns of abdominal, retroperitoneal, or pelvic neoplasms. Malignancies cause hydronephrosis by compression, by direct extension, by lymph nodes, or by retroperitoneal fibrosis. It is rare for hydronephrosis, as a result of obstruction at the level of the ureteral bladder inlet, and back pain to be the presenting symptoms of gastric cancer[1].

Urinary tract obstruction is commonly caused by urolithiasis, transitional cell carcinoma and external compression by tumors, enlarged lymph nodes, and retroperitoneal fibrosis[2]. Such patients are often asymptomatic, but abdominal dullness or the flank pain is one of the typical clinical manifestations directly caused by the obstruction[3]. Occasionally, such patients present additional symptoms or signs as a result of hydronephrosis, such as urinary tract infection, urine output changes, and hypertension[4]. In patients with bilateral ureteral

obstruction or bladder neck occlusion, the serum creatinine levels are often elevated, sometimes causing postrenal acute kidney injury (AKI)[5].

Bladder Cancer (BC) goes for approximately 95% of urothelial cell carcinomas or transitional cell carcinomas, making the disease the most common cancer of the urinary tract. BC is more common in males than in females (1: 2.44), although the diagnosis in females usually occurs in more advanced stages. In Brazil, the estimative for each year of the biennium 2018-2019 is approximately 9,500 new cases in the South, where it occupies the seventh place of more incidental types of cancer (excluding non-melanoma skin tumors), the region with the highest incidence in the country[6].

Aim of the present paper is to analyse the acute kidney injury after ureteral obstruction due to signet ring cell adenocarcinoma of the bladder. During the course of the disease, the tumor partially occluded the urethral ostium of the bladder, which also led to a dysfunctional function of the right kidney, vertiginously deteriorating the renal function of the patient.

Material and methods

This descriptive clinical study was conducted in in Lahore General Hospital, Lahore during January 2019 to November 2019. The data was collected from 10 patients of age range 40 to 60 years. This data include mainly male patients. These selected patients started with hematuria complaint, associated with left flank pain of intensity 8/10 and abrupt onset during his work. The condition of the pain was become worsened after two weeks. When these patients visits the hospital, blood biochemical tests was performed.

Exclusion criteria

All the patients who were suffering from multiple diseases and cardiac surgery were excluded from this study.

Biochemical analysis

5cc blood sample was taken and it centrifuged at 3000rpm for the separation of serum. In continuation of the diagnostic search, an Abdominal and Pelvic Ultrasonography was requested and performed. Cystoscopy with a biopsy was also done for all these patients. Renal function tests and electrolytes were performed for all patients.

Statistical analysis

The data was collected and analysed using SPSS version 17.0. All the values were expressed in mean and standard deviation.

Results

The data was collected from 10 patients of AKI after Ureteral Obstruction Due to Signet Ring Cell Adenocarcinoma of the Bladder. The mean age of the patients was 56.56±8.46 years. The BMI of the selected patients was 24.31±2.26 kg/m^2 and all basic values are presented in table 01.

Table 01: Baseline values of selected patients

Variable	Diseases Group	t Value	*p* Value
Age（Year）	56.56±8.46	1.716	0.081
BMI（kg/m2）	24.31±2.26	2.195	0.031
SBP（mmHg）	140.36±15.70	8.248	0.000
DBP（mmHg）	87.94±10.69	5.967	0.000
PP（mmHg）	52.42±12.87	5.426	0.000
FBG（mmol/）	5.12±0.65	1.764	0.081
TG（mmol/L）	1.74±0.75	1.838	0.071
TC（mmol/L）	4.95±0.76	1.712	0.090
HDL-	1.30±0.43	1.717	0.089
LDL-C	3.46±0.58	1.139	0.266

The data presented in the table shows the high values of WBC which shows the infection inside the body. The levels of urea and creatinine become also high after AKI. All the values are present in table 02.

Table 02: Results of laboratory tests performed for further analysis

	Results	**Reference Values***
Serum creatinine	13.7 mg/ dL	0.4 to 1.4 mg/ dL
Urea	189 mg/ dL	10 to 40 mg/ dL
Sodium	139 mEq/ L	136 to 145 mEq/ L
Potassium	5.6 mEq/ L	3.5 to 5.5 mEq/ L
Glycemia	93 mg/ dL	60 to 99 mg/ dL
CBC (Hemoglobin e Hematocrit)	11.4 g/ dL 31.6 %	14 to 18 g/ dL 40 to 54%
Leukogram [Total: (%) Neutrophils, Bands, Eosinophils, Lymphocytes e Monocytes]	7.301/ mm^3 60%, 2%, 34%, 3%	5.000 a 10.000/ mm^3 55 a 67%, 3 a 5%, 25 a 33%, 4 a 12%

Discussion

There are two broad categories of bladder tumor: urothelial and non-urothelial. Although urothelial types are more common, about 90% of the cases, adenocarcinomas enter in non-urothelial type. Primary urinary Bladder Adenocarcinoma (PBA) corresponds to less than 2% of the total cases of bladder cancers[7]. Signet Ring Cell Variant of Mucinous Adenocarcinoma (SRCC) of the urinary bladder is even rarer, which may correspond to only 2% to 43% of PBA[8]. Unlike other bladder tumors, such as urothelial tumors, PBA tends to be diagnosed in later stages because of its more aggressive and rapidly invasive character[9]. The majority of patients are over 70 years of age, and the presentation in younger patients is more rare[10].

Bilateral ureteral obstruction is a major cause of increased serum creatinine levels, sometimes leading to postrenal AKI. However, in patients with unilateral ureteral obstruction, the serum creatinine levels usually remained normal, as long as their contralateral kidneys are preserved intact[11]. In the present case, although the obstruction of the ureter was unilateral, the patient showed a significant increase in the serum creatinine level. However, there were no signs suggestive of dehydration and there were no recent uses of additional drugs that might have caused renal tubular parenchyma damage. As the patient's serum creatinine level returned to

normal quickly after the removal of the calculus[12], the unilateral ureteral obstruction was thought to be the primary cause of the deteriorating renal function. Previously, Maletz et al reported a rare case of reflex anuria and a decrease in renal function, which was caused by unilateral ureteral obstruction[13]. According to a basic study using canine kidneys, the increased activities of the autonomic nervous system and the renin-angiotensin system were both responsible for the vascular and ureteral spasm in the contralateral kidneys[14-15].

Conclusion

It is concluded that adenocarcinoma is a rare type of bladder cancer, with the subtype signet ring cell adenocarcinoma even rarer. Despite having the same initial clinical presentation symptoms as the other types, it usually presents with a more aggressive and invasive disease, resistant to the standard treatments.

References

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