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CASE REPORT : DIABETES MELLITUS PRESENTING AS EMPHYSEMATOUS PYELONEPHRITIS

Internal Medicine

Dr. Ajay Budhwar Md Internal Medicine, Aace, Budhwar Superspeciality Center, Amritsar

Dr. Parul Malhotra* Intern, Budhwar Superspeciality Center, Amritsar *Corresponding Author

ABSTRACT

Emphysematous pyelonephritis is a gas producing, necrotizing infection involving the renal parenchyma and, in some cases, perirenal tissue. It usually presents with fever, chills, pyuria, back pain or flank pain with abrupt onset of symptoms, however, nausea, vomiting, shock and crepitus overlying affected kidney are also common. It can be associated with diabetes or underlying obstructive uropathy in non diabetics. More than 90% of cases of EPN occur in diabetic patient. It may also occur in immunocompromised people, alcoholic individuals, ureteral obstruction, urinary tract infection and hydronephrosis [2] Computed tomography (CT) remains the optimal diagnostic radiological investigation. Escherichia coli is the most common causative pathogen isolated on urine or pus culture in nearly 70% of the reported cases, Klebsiella pneumoniae (29%), Proteus, Streptococci or mixed organism (10%). [3]Aggressive treatment with broad spectrum antibiotics is recommended along with Percutaneous drainage(PCD).. The case described is an unusual case of diabetes mellitus presenting as emphysematous pyelonephritis .

KEYWORDS

Emphysematous Pyelonephritis, Diabetes Mellitus, Antibiotic, Insulin, Pcd

CASE DESCRIPTION:

A 50 year old male presented with high grade fever with chills and rigor, pain in right flank and vomiting since last 3 days. No other contributory past or present history. On hospital admission, his look was toxic and confused.

On Examination :: temp : 103F, pulse rate : 118/min, RR : 28/min , BP : 90/60 mmhg.

On Physical Examination :: positive findings included severe tenderness and bimanually palpable mass in right lumbar region. No Costovertebral angle tenderness or any flank crepitus was noted.

Labs :: plasma glucose: 504mg/dl, CBC : raised TLC (total count 22,300/mm3) with increased neutrophils and toxic granulation in blood film.

S.Urea: 62mg/dl (ref range: 7-20 mg/dl), S.Creatinine : 1.7mg/dl (ref range : 0.6-1.2 mg/dl in males).

Electrolytes : S.Na : 132 meq/l (ref range: 136-146), K : 3.8meq/l (ref range :3.5-5).

Urine for ketone bodies was negative.

After admitting the patient to ICU, he was managed with volume replacement, insulin infusion via pump and other supportive measures along with CVP monitoring. Empirically intravenous piperacillin-tazobactam and linezolid were also started.

Ultrasound whole abdomen revealed an enlarged right kidney, which was followed by Computed Tomography (CT), which confirmed multiple air pockets in right renal parenchyma and extension to perinephric space with heterogenous contrast enhancement.

Based on above reports and clinical correlation, percutaneous drainage (PCD) of approximately 150ml pus was performed.

His urine culture and sensitivity came positive for growth of *Escherichia coli* (>105 CFU/ml of urine); with sensitivity to imipenem-cilastatin and hence full dose was commenced (1gm i/v thrice daily). Glycated hemoglobin (HbA1c) was 12.2% .

As he started taking orally, i/v insulin infusion was changed to subcutaneous basal-bolus insulin regimen.

On 10th day of hospitalization, he was clinically and hemodynamically stable and his abdominal mass was not palpable. TLC was 9600/mm3 with creatinine : 1.1mg/dl.

FPG was 118 mg/dl with post prandial plasma glucose (PPPG) of 160mg/dl. He was receiving regular insulin s.c before each meal (based on random blood sugar) and Glargine Insulin s.c 10 units at bedtime. Imipenem-cilastatin was continued till 15th day till he was asymptomatic, afebrile with BP of 120/80 mmhg.

Repeat investigations revealed TLC: 6,600/mm3, creatinine: 0.9mg/dl, FPG: 108mg/dl and PPPG: 142mg/dl. Basal bolus regimen was changed to glimepiride 1 mg and metformin 500mg.

He was discharged on oral antibiotics and advised to follow up after 7 days with repeat CT abdomen report. On follow up in outpatient department, he was asymptomatic and his urine showed no pus cells and repeat urine culture also came out to be sterile. Also CT abdomen showed improved findings.

DISCUSSION:

Emphysematous pyelonephritis (EPN) runs a fulminant course and can potentially be fatal if not treated aggressively. The underlying mechanism is thought to be due to high levels of glucose in tissues of diabetic patients, which certain bacteria use for aerobic and anaerobic metabolism; decreased tissue perfusion and defective immune response. Its presentation is very similar to acute pyelonephritis but can be diagnosed based on radiological studies, wherein both USG and CT abdomen are useful. Based on CT findings there are two classification systems for EPN. One classification divides it into Type1 and Type2. The other, more widely used classification is : Class-1 : Gas in collecting system only;

Class-2 : Gas in the renal parenchyma without extension into extra renal space;

Class-3A: Extension of gas/abscess into perinephric space;

Class-3B: Extension of gas/abscess into pararenal space; Class-4: Bilateral EPN or solitary kidney with EPN. Published data are limited on the treatment of emphysematous pyelonephritis, but aggressive approach with antibiotics and PCD have proven successful in many cases upto class 3. If unsuccessful, it is an indication for immediate nephrectomy. Class 4 is treated with surgical approach.

The underlying disease if present like obstructive uropathy or high glucose levels, should also be promptly treated, as was done in our case.

The differential diagnosis to the presence of air either in or adjacent to renal parenchyma includes the following : reflux of air from bladder, air in a renal abscess, entero-renal or cutaneo renal fistula formation, retroperitoneal perforation of abdominal viscus, psoas abscess with gas forming organism or recent urologic or radiologic intervention. CT findings can help differentiate between these possibilities.

EPN is associated with uncontrolled diabetes mellitus, and in non

diabetic patients most commonly occurs post obstructive uropathy. This case however, had no previous history of diabetes mellitus. The HbA1c levels suggest that he was a diabetic presenting as emphysematous pyelonephritis, and raised glucose levels were not merely an outcome of EPN. An early suspicion of EPN should be raised when a poor response to antibiotic therapy is noted in a patient with diabetes thought to have uncomplicated pyelonephritis. Early imaging studies should be performed.

CONCLUSION:

We have described a case of diabetes mellitus presenting as emphysematous pyelonephritis with toxic presentation and hemodynamic instability, initially managed with supportive measures and empiric antibiotics , switching to specific antibiotics, PCD and insulin infusion once the diagnosis was made. The patient responded to the above mentioned treatment was discharged with regular follow up. This case report draws the attention to the variable and fulminant presentation of diabetes mellitus in rare scenarios.

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