

Pyelonephritis Due to Dual Infection in a Diabetic Patient

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Emphysematous pyelonephritis is a rapidly progressive infection of the kidneys¹. It is a rare syndrome, being more common in diabetics. Prompt therapy is needed to salvage the kidneys and also, save the patient. This infection may be caused by bacteria or fungi¹. Reported cases show that this infection is usually mono-microbial. Identification of the causative organism(s) is essential for deciding proper therapy.

A 55 year old female, known type 2 diabetic for one year, presented with sudden onset high fever and abdominal discomfort for one day. She was on oral hypoglycemics, but the control of blood sugar was poor (latest HbA1C: 9.1%). Clinical examination revealed marked tenderness in the left lumbar region. Her pulse rate at presentation was 150/minute and blood pressure was 100/40 mm of Hg. She also complained of dysuria. This was presumed to be a case of severe urinary tract infection with SIRS and immediate i.v. antibiotics were started. Emergency CT scan of abdomen revealed (Figure 1) a large fluid collection in left kidney with gas shadows. CT Attenuation of the collection in kidney was suggestive of pus. Thus, this was confirmed to be a

case of emphysematous pyelonephritis in a diabetic patient and along with antibiotics, surgical drainage was also contemplated. Total leukocyte count was 16300/ μ L with 79% Neutrophils. Urea/Creatinine were normal.

Percutaneous drainage revealed a turbid yellowish fluid. The fluid was sent for microbiological study and antibiotics were continued. There was remission of fever initially after pus drainage, but then, the temperature again increased to around 100°F. The abdominal pain also continued. Gram stain showed abundant pus cells and gram negative bacilli and aerobic culture showed the growth of E.coli. The organism was sensitive to only carbapenems and amikacin. Along with this, ZN stain of the pus was also done which showed presence of acid fast bacilli (1+). Fungal stain was also done, which came negative. Thus, this emphysematous pyelonephritis was caused by dual infection of E. coli and mycobacteria. Blood culture of the patient was negative.

The patient was continued on i.v. meropenem. Oral anti-tubercular drugs were also added. The fever subsided after seven days. Repeat aspiration of pus was not needed. Meropenem was discontinued after 15 days. Oral tubercular drug was continued for the full course. Control of diabetes was also optimised, first with insulin and subsequently with oral drugs.

The most important risk factor for emphysematous pyelonephritis (EPN) is uncontrolled diabetes². In our patient, the HbA1C was more than 9%, which predisposed her to such severe infections. Addition of neurogenic bladder to diabetes increases the risk of EPN even further.²

The commonest organisms isolated from EPN are E. coli and Klebsiella.² Rarely, anaerobic species like clostridium or fungi like candida or Cryptococcus have also been reported.² Polymicrobial infection is extremely rare and usually, it involves two bacilli like Klebsiella and Pseudomonas.³ The organisms are usually isolated from urine or aspirated pus of kidney. But sometimes, blood culture may also help in diagnosis³.

Association of emphysematous pyelonephritis with tuberculosis is again extremely rare⁴. Tuberculosis is difficult to detect by microbiological study of urine or aspirated pus and in the published reports, the diagnosis was usually made after biopsy of nephrectomy specimen⁴. Culture of the pus for mycobacterium is a sensitive test but it is very time-consuming. But in our case, the mycobacterial load was high enough to be detectable in ZN stain of pus only.

The main message to the clinicians in this case is that any clinical specimen (urine/pus) of EPN patients should be examined simultaneously for bacteria, mycobacteria and fungi. Especially in cases where the clinical signs of infection persist or recur even after therapy of one infection, prompt search should be continued for a second infection. In India, for diabetic subjects, ruling out tuberculosis in any infection is a good clinical practice.

References

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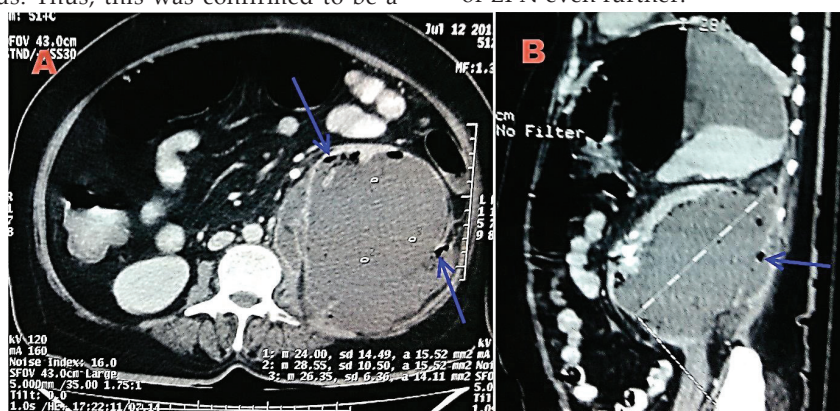


Fig. 1: CECT abdomen of the patient (A: axial cut; B: sagittal cut) showing large collection in left kidney with gas formation (blue arrows)