

# A CASE OF EMPHYSEMATOUS PYELONEPHRITIS

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## INTRODUCTION

- *Emphysematous* pyelonephritis is a particularly severe form of the disease that is associated with the production of gas in renal and perinephric tissues
- Occurs almost exclusively in diabetic patients.
- It is rapidly progressive, requiring appropriate therapy to salvage the infected kidney.
- EPN presents a medical challenge in terms of diagnosis, pathogenesis, classification, and management.
- The prognosis also varies according to the authors and situations, with a mortality of less than 20% to more than 80%
- It is caused by gas-forming organisms, most commonly *Escherichia coli* (*E. coli*), in addition to *Klebsiella*, *Clostridium*, *Candida*, *Aspergillus*, *Cryptococcus*, and *Amoeba*.

## CASE REPORT

• 48 year old female who is a known diabetic since 4 years on irregular treatment came to casualty in a delirious state with complaints of vomiting and upper abdominal pain since 2 days.

- On examination,
  - >she was febrile (102 F),
  - >Tachycardia was present,
  - >epigastric tenderness was present, bowel sounds were heard, with no organomegaly or free fluid.
  - >Fundus examination showed Non proliferative Diabetic retinopathy.
- Random blood sugar was 480mg/dL and urine acetone was positive.
- She was subsequently admitted in ICU, ABG showed metabolic acidosis.
- Treatment for Diabetic ketoacidosis was started along with empirical antibiotic cover.
- Subsequent investigations showed
  - >marked leukocytosis,
  - >elevated urea levels,
  - >Ultrasound abdomen and pelvis showed dirty shadows in pelvicalycial region
  - >CT abdomen and pelvis (plain) was taken which confirmed diagnosis of Emphysematous pyelonephritis.
  - >Culture and sensitivity report was soon obtained which showed *Klebsiella* growth
- Patient was started on Piperacillin and tazobactam.
- Patient slowly recovered during the course of hospital stay and was discharged in a hemodynamically stable condition with insulin therapy for diabetes.

## DISCUSSION

- EPN is a severe, necrotizing infection characterized by bacterial production of gas within the renal parenchyma.
- The conditions required for the generation of EPN are
  - (1)the presence of pathogenic bacteria capable of mixed acid fermentation<sup>1</sup>,
  - (2)high levels of glucose in tissue,
  - (3)impaired tissue perfusion<sup>2</sup>.

## REFERENCES

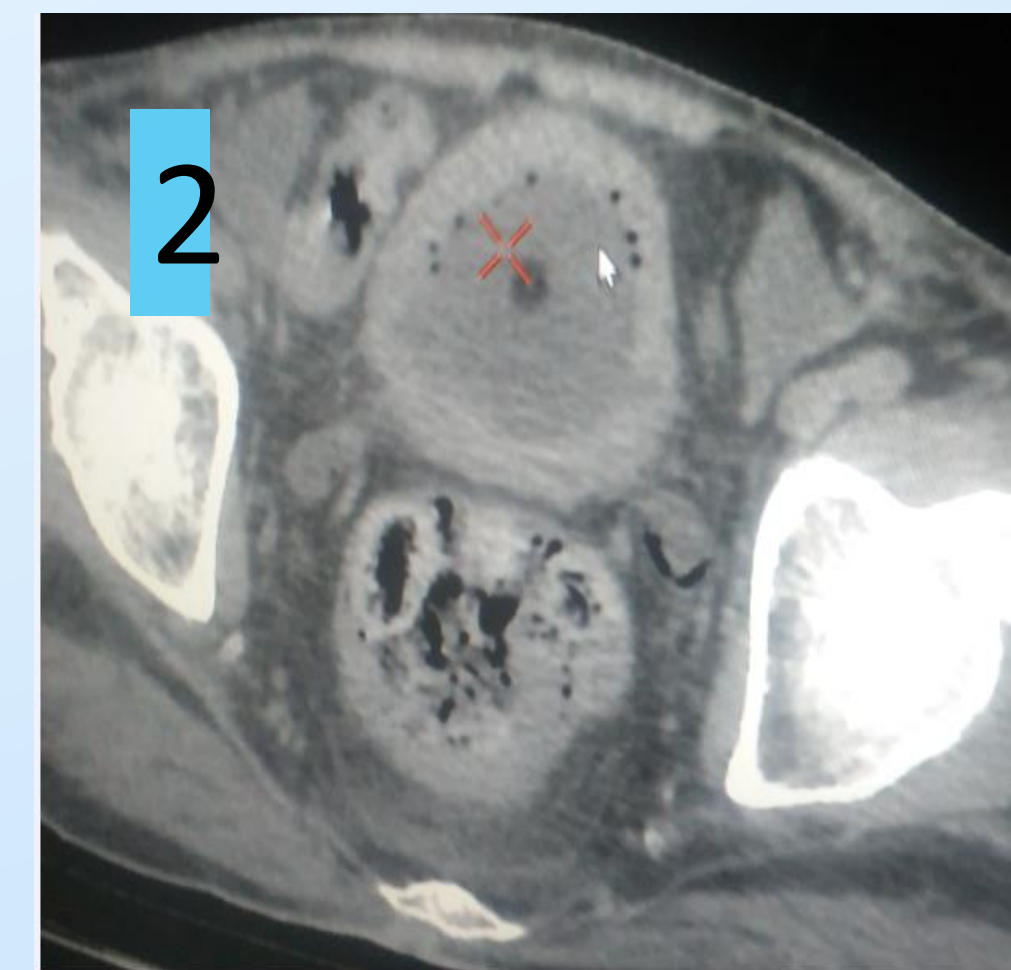
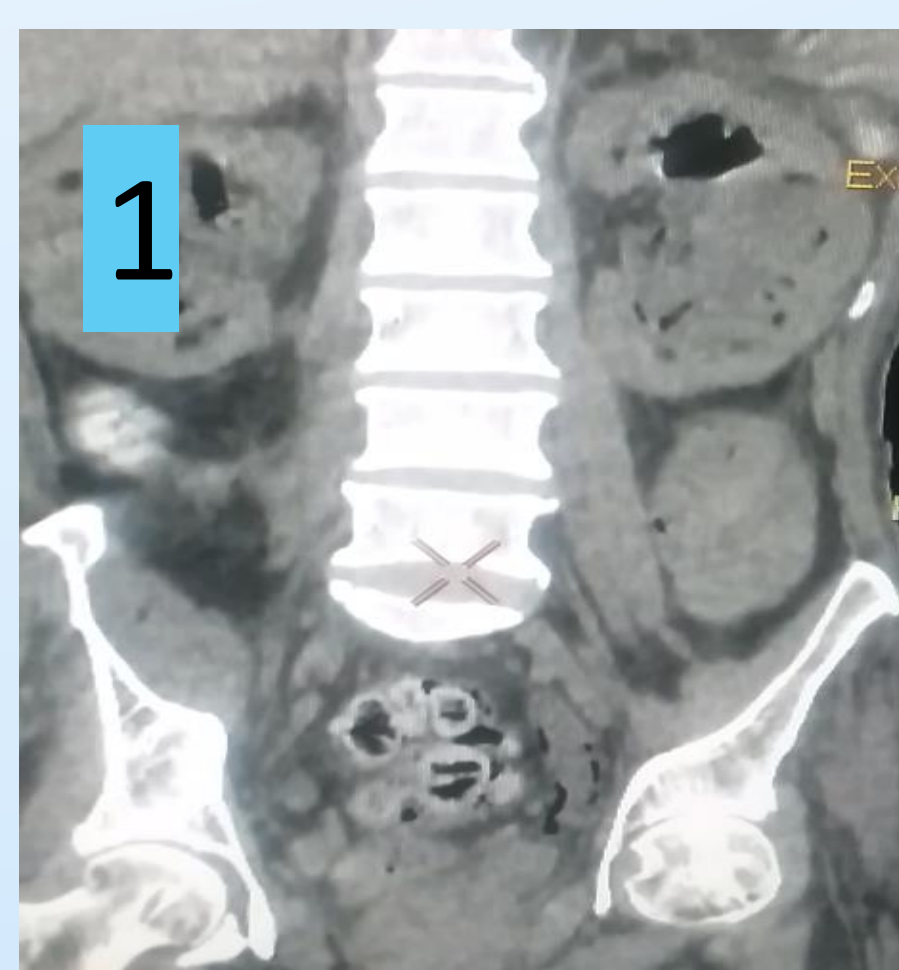
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- In Diabetes the patient's compromised immune system rendered her unable to fight off infection from these gas-forming bacteria that result in EPN in this case.
- The pathogenesis of gas formation requires pathogenic bacteria capable of mixed acid fermentation, a hyperglycemic environment, and localized tissue ischemia.
- Because a hyperglycemic environment is one of the requirements in gas formation, it only makes sense that diabetes is a significant predisposing factor.
- It has been estimated that up to 95% of EPN cases have underlying uncontrolled diabetes mellitus<sup>3</sup>.
- Furthermore, hyperglycemia in association with impaired blood supply to the kidneys from vasculopathy—both of which are prevalent in diabetic patients—facilitates the process of anaerobic metabolism<sup>4</sup>.
- Current evidence suggests females are more susceptible to EPN because they are also more susceptible to urinary tract infections<sup>5,6,7</sup>.
- *E. coli* is noted to be a very common pathogen in EPN<sup>5-10</sup>.
- ***Klebsiella* however is not so common.**
- In patients with extensive/fulminant disease with hemodynamic compromise many have determined that, together with fluid resuscitation and antibiotics, immediate nephrectomy should not be delayed for the successful management of EPN<sup>11-13</sup>.

## CONCLUSION

- EPN is a severe acute necrotizing renal parenchymal infection caused by gas-forming organisms, among others.
- It possesses great risk and also possesses higher mortality than conventional cases of pyelonephritis.
- EPN should be suspected in patients who are not responding to antibiotics in which there is unexplained abnormal gas formation in the body, especially in the immuno-compromised, like the diabetic with poor glycemic control and transplant recipient on immuno-suppression.

EMPHYSEMATOUS PYELONEPHRITIS  
Fig 1 : Shows air in the left kidney  
Fig 2 : Shows air pockets in the bladder.  
Fig 3 : Shows air in pelvi ureteric system in the left.



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