

Emphysematous Pyelonephritis

Subhash. S. Pujari^{1*}, Reginraj²

¹Professor of medicine, DM Wayanad Institute of Medical Sciences, Meppadi, Kerala, India

² Junior Resident, DM Wayanad Institute of Medical Sciences, Meppadi, Kerala, India

*Corresponding Author:

Name: Dr .Subhash. S Pujari

Email: subhashpujari2002@yahoo.com

Abstract: Diabetes mellitus is affecting people around the globe. It is increasing in epidemic proportion in South East Asia. At the same time complications of diabetes are increasing. Life threatening complication like Emphysematous pyelonephritis is on the rise due to uncontrolled diabetes mellitus. We present a case of Emphysematous pyelonephritis in uncontrolled diabetic patient, which she recovered completely with timely diagnosis and proper higher antibiotic use.

Keywords: Diabetes mellitus, Emphysematous pyelonephritis

INTRODUCTION

It is a severe life threatening infection seen in patients with diabetes mellitus. It is characterised by gas in the renal parenchyma and perirenal tissues. This complication of urinary tract infection in diabetes mellitus has very high mortality [1]. Infection involving parenchymal tissue with or without perirenal tissue is called as emphysematous pyelonephritis and when it involves collecting system it is coined as emphysematous pyelitis. Emphysematous pyelitis has better prognosis with rapid recovery as compared to emphysematous pyelonephritis [2]. Risk factors for emphysematous pyelonephritis are diabetes mellitus, alcoholism, neurogenic bladder and anatomic deformities in urinary system .95% of patients with emphysematous pyelonephritis have diabetes mellitus [3]. As the mortality is very high early diagnosis and proper treatment are vital in managing these patients. We report a case of emphysematous pyelonephritis in uncontrolled diabetes mellitus type 2 which recovered well on medical management.

CASE REPORT

A female patient aged 61 years presented to us with history of fever left side flank pain and dysuria of four days duration. She also had recurrent bouts of vomiting since 4 days. She was known case of hypertension and diabetes mellitus type 2 on treatment. There was no history of haematuria. On examination patient was febrile and pulse 100/min BP 200/100 mm of HG .Patient was toxic. Per abdomen examination showed left renal angle tenderness and no organomegaly. Cardiovascular, Respiratory and Central nervous system examination was unremarkable. Her investigations were as follows. HB 9.3 grams %.Total WBC count 16900 and 90%were neutrophils. Urine

showed albumin trace and 40 -50 pus cells /hpf.RBS 400mg.Urine culture showed *E. coli* sensitive to piperacillin and tazobactam. Ultrasonography abdomen showed gas in the left renal parenchyma and CT abdomen showed gas in the left renal parenchyma .A diagnosis of emphysematous pyelonephritis done and started on piperacillin plus tazobactam antibiotics and sugar was controlled with insulin. She received antibiotics for 10 days and recovered completely and discharged with insulin and antihypertensives.



Fig. 1: CT image showing gas in the renal parenchyma of left kidney



Fig. 2: Ct abdomen image showing gas in left renal parenchyma

DISCUSSION

Emphysematous pyelonephritis is a rare and severe life threatening complication seen in uncontrolled diabetes mellitus patients. It carries high mortality compared to emphysematous pyelitis[4]. Emphysematous pyelonephritis is first described in 1898 with pneumaturia as a result of gas forming agents [5]. The most common organisms causing emphysematous pyelonephritis is *E. coli* (70%), *Klebsiella pneumonia* (29%), and *Proteus* organisms. These are fermenting organisms, produce hydrogen, nitrogen and carbon dioxide and oxygen [6]. Factors predisposing to emphysematous pyelonephritis are diabetes mellitus, impaired immune mechanisms, obstructive uropathy, renal stones and developmental defects in urinary systems. The common clinical features are fever abdominal pain, disorientation dysuria, confusion and septicaemia. Our patient presented with fever and septicaemia with high blood count and pyuria. Our patient had persistent left flank pain which improved with treatment. Most specific investigations to diagnosis of emphysematous pyelonephritis are ultrasonography of abdomen to locate gas in the renal parenchyma and CT abdomen which will demonstrate gas in parenchyma and perinephric tissues. Our patient also had gas in renal parenchyma as seen in CT pictures. Most common organism is *E. coli* as reported by many authors. Our patient also had infection with *E. coli* as evidenced by culture showing *E. coli* growth. Renal ultrasonography confirms emphysematous pyelonephritis in approximately 80 % of cases [7]. CT scan is 100% sensitive.

According to CT emphysematous pyelonephritis is graded into 4 grades depending on anatomical location of gas on ct image.

- Class 1: gas confined to collecting system
- Class 2: gas confined to renal parenchyma
- Class 3a: gas extending to perinephric region

- Class 3b: gas extending beyond gerota fascia
- Class 4: bilateral emphysematous pyelonephritis

Mortality can be reduced by early diagnosis and prompt institution of treatment of higher antibiotics. Most commonly used antibiotics are cephalosporins and fluoroquinolones. Usually 3 to 4 weeks of treatment is needed to clear the infection. Our patient received piperacillin plus tazobactam for 2 weeks and recovered completely.

CONCLUSION

Diabetes mellitus is affecting the people in epidemic proportion. The complications of varying nature are bound to affect people. The serious and life threatening complication like emphysematous pyelonephritis need early diagnosis and prompt use of higher antibiotics to reduce the mortality. The main aim should be control of diabetes mellitus and prevent complications.

ACKNOWLEDGEMENT

We thank our radiology colleagues for their cooperation in providing images

REFERENCES

1. Hui L, Tokeshi J; Emphysematous pyelonephritis. Hawaii Med J., 2000; 59(8): 336-337.
2. Roy C, Pflieger DD, Touchmann GM; Emphysematous pyelitis findings in five patients. Radiology, 2001; 218(3): 647-650.
3. Ubee SS, Mcglynn L, Fordhan M; Emphysematous pyelonephritis. BJU International, 2011; 107(9): 1474-1478.
4. Grayson DE, Abbot RM, Levy AD; Emphysematous infections of abdomen and pelvis, a pictorial review. Radiographics, 2002; 22(3): 543-561.
5. Kelly HA, Mc callum WG; Pneumaturia. JAMA, 1898; 31: 375-381.
6. Huug JJ, Chan, Kmruaan MK; Mixed acid fermentation of glucose as mechanism of emphysematous urinary tract infection. J Urol., 1991; 146: 148-151.
7. Tang HJ, Li CM, Yen M, Chan YS, Wann SR, Liu HH; Clinical characteristics of emphysematous pyelonephritis. Journal of Microbiological Immunological Infection, 2001; 34(2): 125-130.