

Asymptomatic Emphysematous Pyelonephritis - Positron Emission Tomography Computerized Tomography Aided Diagnostic and Therapeutic Elucidation

Abstract

The authors report an interesting coincidental unearthing by 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT) of a potentially serious medical condition of emphysematous pyelonephritis in a case of nasopharyngeal carcinoma. The management by conservative ureteric stenting and antibiotics was done with gratifying clinical outcome.

Key words: *Emphysematous pyelonephritis, Double J Stent Nephrectomy*

Introduction

Emphysematous pyelonephritis, a less frequently noticed acute clinical condition, is invariably associated with uncontrolled diabetes or immune suppression. Infective renal mass with gas lucencies is the hall mark with associated pyrexial and septic state. Asymptomatic incidental detection of the condition during follow up (18F-FDG PET/CT) study in a treated case of nasopharyngeal carcinoma, and its further management by nonradical noninvasive treatment modality based on 18F-FDG PET/CT findings, is the unique hall mark in the present case.

Case Report

A 65-year old female of histopathologically proven primary nasopharyngeal carcinoma was treated with concurrent chemo radiation of 60 Gy radiotherapy in 30 fractions of 2 Gy each, along with weekly Cisplatin. Except for well controlled type 2 diabetes on oral hypoglycemic drugs, the patient had no other co morbid conditions, and was symptom free after completion of the radical treatment. The clinical examination revealed no evidence of disease at the local site and no loco regional lymphadenopathy. Hematological, biochemical and metabolic parameters were within normal limits. F18 FDG PET/ CT was performed for the end of treatment evaluation and compared

with the pretreatment 18F-FDG PET/CT. Present study revealed no abnormal morphologic or metabolic focus at the primary site of nasopharynx and no loco regional adenopathy either morphologic or metabolic. Interestingly, in the abdominal sections, a large heterogeneous peripherally enhancing hypodense 85x83x80 mm mass with peripheral FDG avidity and central void lesion containing multiple pockets of air lucencies within, was seen in the postero inferior aspect of right kidney [Figure 1a] within feromedial infiltration into the adjoining right psoas muscle [Figure 1b]. The free gas lucency was also noted in non dependent part of the urinary bladder and hypodense debris amidst the contrast filled bladder at the right vesico ureteric junction [Figure 2]. The findings were characteristic of emphysematous pyelonephritis. Ultrasonography (USG) revealed classical echogenic scattered echoes typical of free gas in a mixed echoic mass corresponding to the PET CT outlined lesion in the right kidney [Figure 3]. The initial PET CT done prior to initiation of treatment was reviewed to see the renal morphology, which showed both kidneys of normal morphology and excretion [Figure 4]. In view of the potentially serious nature of the condition and the patient being absolutely symptom free and afebrile, a detailed retrospective history was taken, which revealed an episode of febrile

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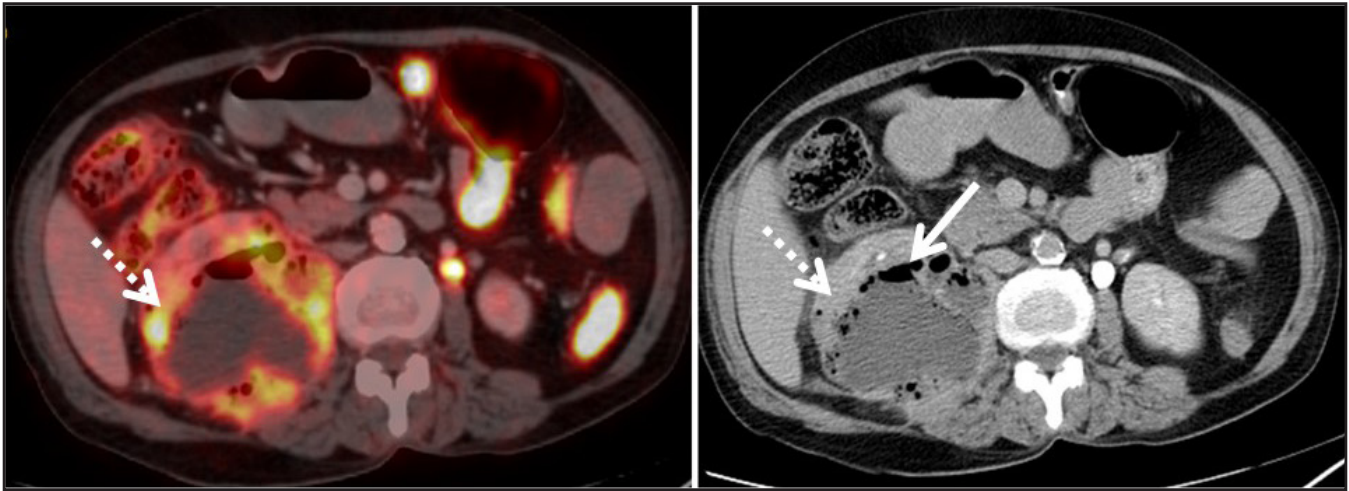


Figure 1 (a): Axial PET/ CT images of abdomen demonstrating hypodense abscess cavity in the postero inferior part of right kidney with multiple pockets of air lucencies within (arrow) and FDG avid uptake in the peripheral enhancing part (dotted arrow).

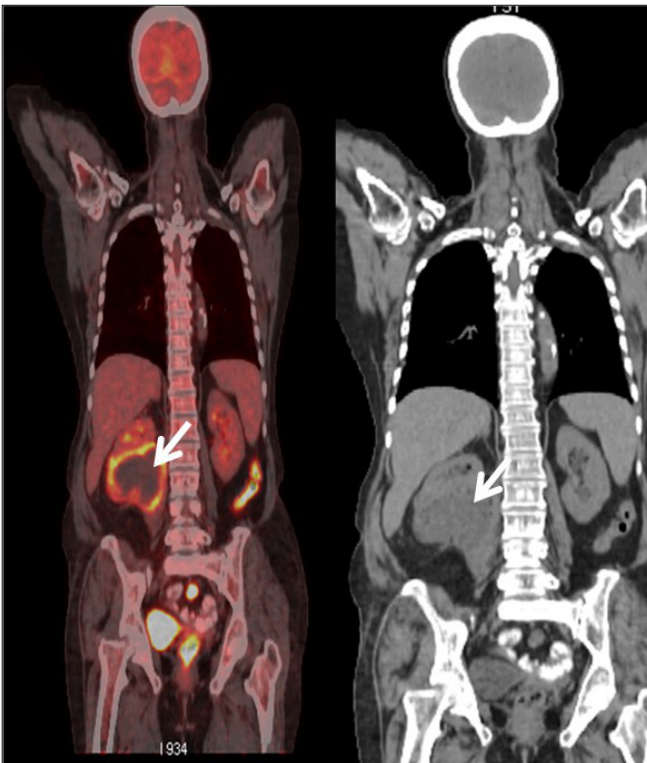


Figure 1 (b): Coronal PET/CT sections showing extension and infiltration inferomedially into adjacent right psoas muscle (arrow)

neutropenia during the fourth cycle of chemotherapy. It was managed conservatively and the patient was afebrile since then. Despite the present symptom free state, since the condition can flare up any time, a curative treatment was planned whenever immune status was compromised. The conventional options were nephrectomy and percutaneous drainage, the former radical surgery and the latter invasive. In view of the evidence of free gas in the bladder and



Figure 2: Axial contrast CT section of urinary bladder showing a hypodense filling defect at the right vesico ureteric junction (solid arrow) and free gas lucencies in the anterior aspect of urinary bladder (dotted arrow)

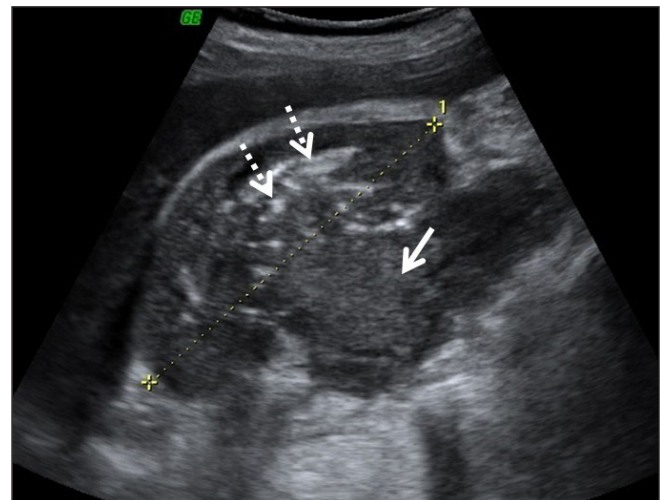


Figure 3: Ultrasound abdomen outlining enlarged right kidney with ill defined heterogeneous mass in postero inferior portion (arrow) containing dirty echogenic foci of air (dotted arrow).

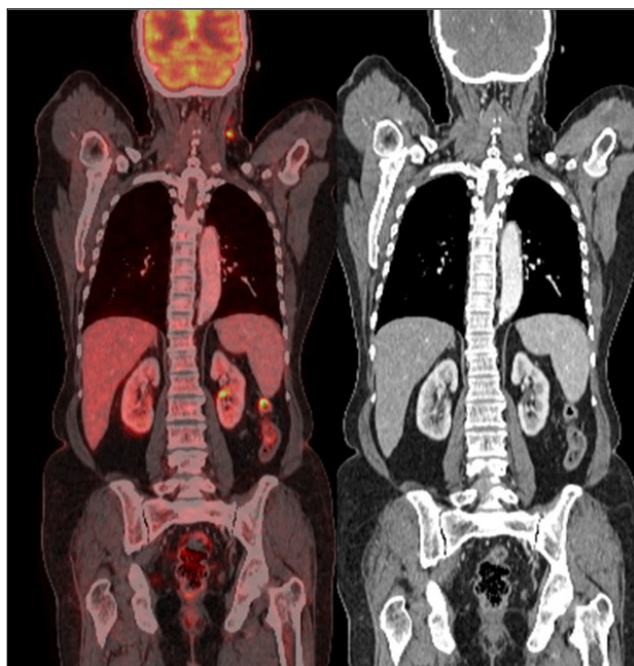


Figure 4: Pre treatment staging coronal PET/CT images showing normal morphology of both kidneys.

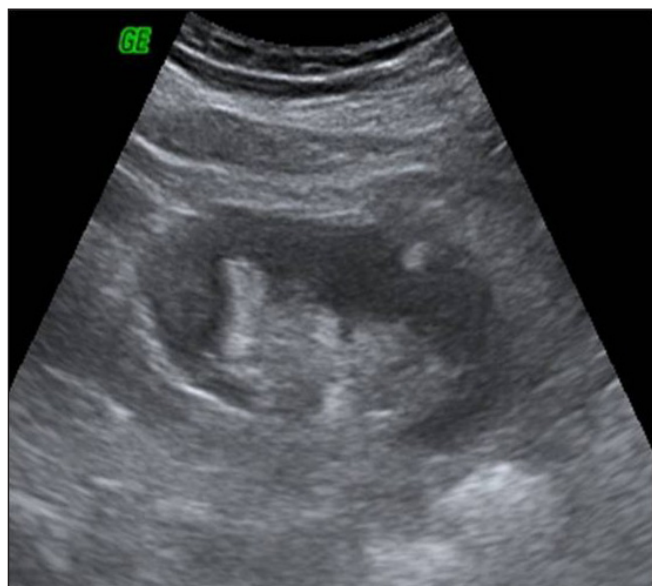


Figure 5: Follow up ultrasonography showing complete disappearance of the abscess and return of the renal contour to normal.

the debris seen at the vesicoureteric junction, there was an ample objective proof of the abscess communicating with collecting system. Hence, a Double J (DJ) stent placement to facilitate better drainage of infective material into the bladder alongwith broad spectrum antibiotics was endeavored before embarking on more invasive and radical measures. The patient was followed up after three weeks with an ultrasonography, which showed gratifying near complete disappearance of the abscess, and return of the renal contour to normal and disappearance of all the gas in the kidney and bladder as well [Figure 5]. Plain CT and



Figure 6 (a): Post stenting CT topogram showing disappearance of free gas lucencies in the right renal region with DJ stent in situ.



Figure 6 (b): Plain CT abdomen showing resolution of the emphysematous abscess and the urinary bladder gas and debris.

topogram of abdomen subsequently revealed disappearance of free gas lucencies in the right renal region with DJ stent in situ [Figure 6a] with resolution of the emphysematous

abscess, urinary bladder gas and debris [Figure 6b]. The patient on follow up was disease free from both the primary nasopharyngeal carcinoma and emphysematous pyelonephritis.

Discussion

Emphysematous pyelonephritis is a rare life threatening severe infective condition of the renal parenchyma causing accumulation of free gas in the renal soft tissues.^[1] The patients are typically very ill with sepsis and circulatory failure. The factors that predispose persons with diabetes include uncontrolled diabetic state, high levels of glycosylated hemoglobin, and impaired host immune mechanisms.^[2] Diabetic microangiopathy may also contribute to the slow transport of catabolic products and may lead to accumulation of gas. Transplanted kidney is also susceptible to this condition because of associated high-risk factors in the recipient, such as diabetes and immunosuppressant. Literature is replete with emphysematous pyelonephritis reported with various forms of presentation. Nevertheless, there has been no subjective or objective revelation of such serious condition and the condition of patient being symptom less, all through the illness.^[3]

The management, traditionally being aggressive and surgery in the form of nephrectomy, is considered mandatory. A conservative alternative to radical surgery is the combination of antibiotics and drainage.^[4,5] The drainage procedure has traditionally been percutaneous drainage, which is invasive.^[6] The highlight of the case is the management with non invasive endoureteric DJ stenting and antibiotics with effective outcome confirmed on follow up USG and CT.^[6,7] The decision for DJ stenting was impelled by the PET CT evidence of free gas in the urinary bladder and debris seen in the bladder. DJ stent ensures a constantly open vesicoureteric junction. The drainage of the infected debris is facilitated not only through the DJ stent lumen, but also through the space between the stent and the ureteric wall.^[8] Another highlight of the case is the incidental nature of detection of such a serious condition, which was clinically unnoticeable due to clinical symptoms conspicuous by their absence or any evidence of systemic manifestations of fulminant infection such as fever, chills rigors, urinary complaints or uncontrolled diabetes. The incriminating causative

factor unearthed is the possible transient chemotherapy induced immune suppression as evidenced by an episode of febrile neutropaenia during fourth cycle of chemotherapy. The patient having contracted the infection remained asymptomatic till its detection during follow up PET CT study.

Conclusion

A potentially serious clinical entity of emphysematous pyelonephritis has serendipitously been discovered and treated in a case of nasopharyngeal carcinoma. Non invasive treatment modality with DJ stenting and antibiotics was suggested based on PET CT findings of free gas not only in the kidney but also in the urinary bladder. The favorable clinical outcome and salvaging the kidney has been achieved with out recourse to radical nephrectomy or invasive nephrostomy.

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Conflicts of interest

There are no conflicts of interest.

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