



Case report

Forgotten DJ stent presenting with emphysematous pyelonephritis: A life threatening complication

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A B S T R A C T

Introduction: Emphysematous pyelonephritis (EPN) is an uncommon suppurative infection of renal parenchyma and perirenal tissue characterized by production of gas within renal parenchyma, collecting system or perinephric tissue.

Case presentation: We report a case of young non diabetic female with past history of extracorporeal shock wave lithotripsy (ESWL) who presented with intermittent lower abdominal pain, dysuria and left lower limb swelling. Abdomen examination was notable for tenderness at left iliac fossa and fullness at left renal angle. Blood investigation showed leukocytosis and deranged creatinine levels. Urine analysis showed pyuria. Trans-abdominal ultrasound revealed left nephrolithiasis with moderate hydronephrosis, vesical calculus and double J (DJ) stent in situ. Patient was diagnosed as acute pyelonephritis and started on intravenous antibiotics. Despite on medical management, the condition deteriorated and progressed to septic shock. Computed tomography of kidneys, ureters and bladder (CT KUB) showed air fluid level in calyceal system with perinephric collection and confirmed diagnosis as emphysematous pyelonephritis. Patient underwent surgical drainage to control the sepsis. Few days later after control of sepsis and optimization, left nephrectomy and removal of retained DJ stent was done.

Clinical discussion: This case report highlights the need to consider emphysematous pyelonephritis as a possible diagnosis in patients harbouring DJ stents even in young non diabetics. Early aggressive medical management coupled with urological intervention is a valuable alternative to upfront emergent nephrectomy. However, surgery should not be delayed in patient with fulminant infection at presentation or who failed on conservative management.

Conclusion: Emphysematous pyelonephritis warrants high index of suspicion for timely diagnosis and can be fatal if not recognized early and promptly treated.

1. Introduction

Emphysematous pyelonephritis is an uncommon suppurative infection of renal parenchyma and perirenal tissue [1]. The condition is predominant in diabetic patients and in patients with urinary tract obstruction. The risk of developing emphysematous pyelonephritis secondary to urinary tract obstruction is 25-40% [1,2]. The clinical course can be severe and life threatening if not recognized and treated promptly. Percutaneous drainage and antibiotics are now the initial treatment modality. Emergency nephrectomy is only considered if medical therapy fails [3,4]. We report a case of life threatening emphysematous pyelonephritis secondary to ureteral obstruction caused by forgotten DJ stent initially dealt with surgical drainage followed by

nephrectomy. This case report has been written in line with SCARE guidelines [5].

2. Clinical presentation

Thirty five years old lady with history of right pyelolithotomy eight years back and left ESWL five years back presented with intermittent lower abdomen pain and dysuria for 5 months and left lower limb swelling for 3 days. She looked pale and had tender left lower limb swelling. Her pulse was 104/min, blood pressure 100/60 mmHg and temperature 100.6 F. Abdominal examination was notable for left iliac fossa tenderness and fullness at left renal angle. She was clinically diagnosed as acute pyelonephritis with left leg cellulitis. Laboratory

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studies showed hemoglobin 5.7 g/dl, total leukocyte count 16,900/mm³ and serum creatinine 3.4 mg/dl. Urine analysis showed pyuria. Ultrasound revealed left nephrolithiasis with moderate hydronephrosis, vesical calculus and DJ stent in situ. Upon asking for detailed history, neither the patient nor her relatives were aware about DJ insertion before ESWL. Patient was admitted and started on intravenous piperacillin-tazobactam and amikacin on renal adjusted dosage. The next day patient deteriorated and shifted to ICU. Her blood pressure dropped to 70/50 mmHg, was tachycardic, developed crepitations on left renal area and in left leg, and rapidly progressed to septic shock with metabolic acidosis (pH 7.19, HCO₃ 12.3 mmol/l). Immediate CT KUB done showed hydronephrotic left kidney with air fluid level within all calyces with perinephric abscess, vesical calculus, DJ stent in situ and inflammatory changes in psoas muscle, lateral abdominal wall and subcutaneous plane of groin region (Figs. 1 and 2).

The diagnosis of left emphysematous pyelonephritis with necrotizing fasciitis of left leg was made and planned for emergency surgical intervention. Emergency left nephrectomy was not possible because of poor physiological status of the patient which led us to perform surgical drainage of left perinephric abscess. Multiple releasing incision were given on left lower limb and all wound were left open. After surgery, she was transferred to surgical ICU and kept under mechanical ventilation, inotrope support. Blood transfusion and antibiotic meropenam was started. *Acinetobacter sp* was isolated from pus, and then switched to polymyxin B as per sensitivity reports. Wound was managed with daily dressing under intravenous anaesthesia. Nasogastric feeding was initiated to met nutritional requirement. Over days, her general condition improved, septic shock and metabolic acidosis gradually resolved. However, weaning from ventilation was difficult, therefore tracheostomy was done on 9th day. Sixteen days later, definitive intervention was done, left kidney was removed along with retained DJ stent from previous left flank incision, cystolithotomy done for vesical calculus and secondary suturing for lower leg wound (Figs. 3 and 4). Tracheostomy was gradually decannulated and allowed to close spontaneously. All the procedures were performed by experienced team of general surgery and urologist of Patan Hospital. She made complete recovery from the surgery and discharged after 42 days. The patient is under regular follow up and surgical wounds have healed without any complications.

3. Clinical discussion

Emphysematous pyelonephritis (EPN) is a rare but life threatening

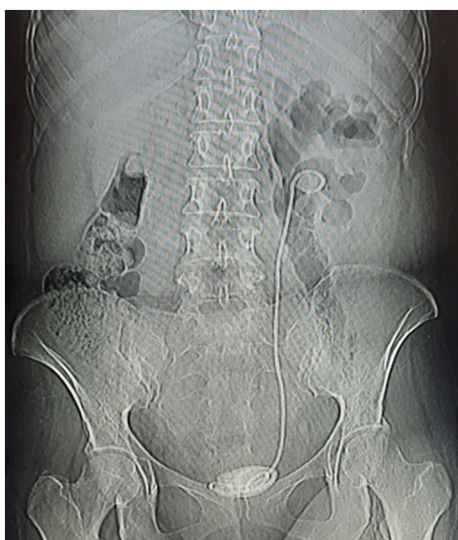


Fig. 1. CT KUB scout image showing forgotten DJ stent with calculus at both ends and gas shadows in left renal area extending to psoas muscle area.

acute suppurative infection of the kidney, characterized by production of gas within the renal parenchyma, collecting system or perinephric tissues. *Escherichia coli* remains the most common causative pathogen. Up to 95% have underlying uncontrolled diabetes mellitus [1,2,6]. The presenting symptoms are similar to acute pyelonephritis. Rapid progression to septic shock and crepitus around the renal area may be felt in severe EPN, as seen in our case. The clinical course can be severe and life threatening mainly of septic complications. Diagnosis is often radiological. CT KUB is the imaging of choice which allows for early diagnosis and further management [3,7]. Risk factors indicating poor prognosis include thrombocytopenia, acute renal failure, altered mental status and shock [8,9]. Extensive renal parenchymal involvement (>50%) on CT scan predicted the need for nephrectomy [9].

In our case ureteral obstruction secondary to retained DJ stent was implicated as risk factor. The literature is abundant with reports of forgotten DJ stent and its complications. Complications are many and varied, which include stent syndrome, recurrent UTIs, stent migration, stent breakage, blockage and encrustation [10–12]. One of the reason for the forgotten stent is due to failure on the part of treating surgeon to counsel the patient effectively. Similarly, remoteness of areas, poverty and illiteracy hinders patient compliance making them prone to forgotten stents [12]. In our case, the patient underwent left ESWL elsewhere and as per history the treating doctor has not counselled about the placement of stent and landed with life threatening complication five years later. Therefore, patient as well as relative should be educated about the need for timely removal. The practice of taking patient's signature on operation notes after counseling and showing post-surgery X-ray KUB explaining them the presence of stent might improve compliance and decrease the occurrence of forgotten stents.

Previously, emergency nephrectomy together with antibiotics was considered as best management for EPN. With advances in technique, percutaneous drainage along with antibiotics is now being considered as best initial management [3,4,13,14]. This technique is associated with lower mortality and preserve the function of affected kidney. In a systematic review by Somani et al. the most successful management was medical management along with percutaneous drainage which had lowest mortality as well [15]. In our case, patient clinical condition deteriorated and developed necrotizing infection involving left lower limb despite medical management, therefore surgical drainage was done. In present scenario, nephrectomy should be reserved for the more fulminant cases presenting with hemodynamic compromise or progressive infections despite percutaneous drainage and medical therapy.

4. Conclusion

This case report highlights the need to consider emphysematous pyelonephritis as a possible diagnosis in patients harbouring DJ stents or renal stone even in young non diabetics. Emphysematous pyelonephritis can be fatal if not recognized early and promptly treated. Aggressive medical management and percutaneous drainage is a valuable alternative to upfront emergent nephrectomy however surgery should not be delayed in patient who failed to respond on conservative management. This case also emphasized the need for proper counseling to patient regarding placement of DJ stents and its timely removal to avoid potential complications.

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CRediT authorship contribution statement

The authors were involved in surgery and care of the patient.
Bidhan Sigdel: Conceptualization, Writing-Original draft preparation.

Samir Shrestha: Manuscript reviewer and editing.

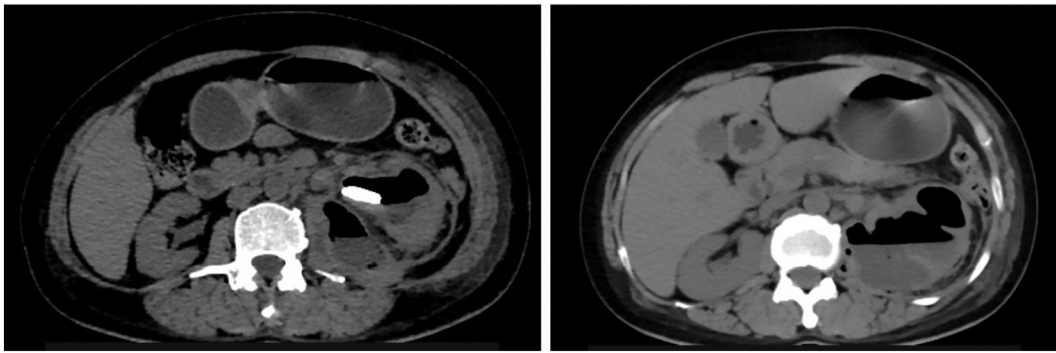


Fig. 2. CT KUB showing hydronephrotic left kidney and air foci within left calyx.

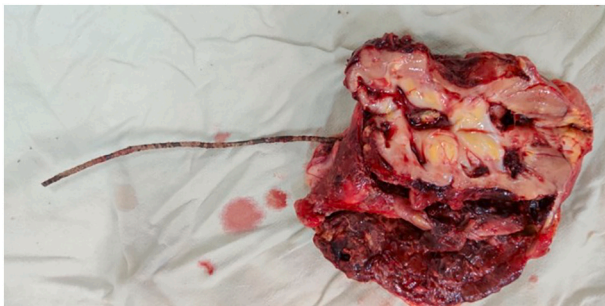


Fig. 3. Resected specimen showing left kidney with proximal part of retained DJ stent.



Fig. 4. Removed retained DJ stent with calculus at both ends.

Pukar Maskey: Manuscript reviewer and editing.

Declaration of competing interest

The authors declare no conflict of interest.

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Ethical approval

This case report is exempt from ethical approval.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Research registration

Not applicable.

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Bidhan Sigdel.

Provenance and peer review

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