Gastropulmonary Fistula in a Renal Transplanted Patient: Who Knew?

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Abstract:

Patients requiring immunosuppressive therapy after transplantation are susceptible to infection by a variety of common and uncommon pathogens, and infection has been the major cause of death in organ transplant recipients. Here we present one of a kind case where klebsiella pneumonia led to a fatal and life threatening complication i.e. gastro pulmonary fistula in a renal transplant recipient.

Key Words: Kidney Transplant, gastropulmonary fistula, sepsis, immune compromised, complications, klebsiella pneumoniae.

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Received: August 8,2020. Accepted March 8, 2021.

PJKD 2021;5(1):22-26

Introduction

Patients requiring immunosuppressive therapy after transplantation are susceptible to infection by a variety of common and uncommon pathogens, and infection has been the major cause of death in organ transplant recipients. Kidney transplant recipients are at significant risk for developing infection by multidrug – resistant pathogens including vancomycin resistant enterococci , methicillin resistant staphylococcus aureus, extended-spectrum beta-lactamase producing *Klebsiella pneumoniae*, carbapenem-resistant *Aceinobacterbaumannii*, carbapenem-resistant *Pseudomonasaeruginosa*, and ESBL-producing *Enterobacterspp.*¹ Physicians caring for immunosuppressed patients after renal transplantation have become familiar with the fulminant and potentially lethal course of these organisms.² However, there remain few entities that possess a diagnostic challenge to a treating physician and are rare in existence. Here we present one of a kind case, where klebsiella pneumonia led to a fatal and life threatening complication i.e. gastro pulmonary fistula in a renal transplant recipient.

Case Description

A 25 year old gentleman underwent ABO compatible live related renal transplant at our facility; with the patient’ s mother donating the kidney having 1A and 1DR mismatch. The cause of native kidney disease was labeled as chronic glomerulonephritis. His per-op and immediate post op period remained uneventful, and he was discharged with serum creatinine of 1.3mg/dl at the 7th post-operative day. He did not receive any induction therapy with either anit-thymocyte globulin norbasiliximab. His maintenance immunosuppression included prednisolone (1mg/kg/day), mycophenolate mofetil (1000mg BD) and tacrolimus (0.1mg/kg/day). PCP prophylaxis was also given. The chest X ray on discharge was unremarkable (see figure 1).

Figure1: Chest x-ray of patient without any apparent abnormality.

Within 2 months of kidney transplantation, the patient had to be admitted twice for chest infections at our facility. On both occasions he complained of fever, shortness of breath and productive cough. His chest X ray showed a right homogenous opacity (figure 2). His sputum culture grew *Pseudomonas aeruginosa* sensitive to meropenem, imipenem and colistin. During both admissions patient got better with intravenous meropenem and moxifloxacin. The serum creatinine, which initially increased to 3.8 mg/dL, settled down to 1.4 mg/dL on discharge each time. The CMV DNA PCR which was initially negative on the first admission was found to be positive in the second admission with a load of 234,105 copies per mL. The patient was given intravenous ganciclovir for 21 days and was shifted onto oral valganciclovir after two of his CMV DNA PCRs were negative.

Figure 2: Chest X-ray of the same patient showing consolidation of right middle lobe.

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On the current admission patient presented with productive cough, severe left hypochondrial pain and worsening of shortness of breath. He reported that he had hardly passed any urine in the last 3 days. On clinical examination he was tachypneic with a heart rate of 100/minute, a blood pressure of 100/60 mmHg but did not have a fever. He remained oriented and was obeying all commands. Chest auscultation revealed bilateral coarse crepitations more obvious on the left side. His laboratory investigations showed hemoglobin of 4.8 g/dL, a total leucocyte count of $41.8 \times 10^3/\text{ml}$ (95% neutrophils), a platelet count of $292 \times 10^3/\text{ml}$. The C-reactive protein was 346 with an erythrocyte sedimentation rate of 112 mm/minute.

His renal functions showed marked derangements with a serum urea of 235 mg/dl, serum creatinine 6.9 mg/dl, serum sodium 130 mEq/L and potassium of 6.0 mEq/L. His chest Xray revealed left sided cavitating pneumonia (figure 3). The patient was admitted and started on acute hemodialysis through his previously functioning AV fistula. A pulmonology consult was sought, and a High-Resolution CT (HRCT) chest was carried out followed by bronchoscopy.

HRCT chest showed bilateral lung parenchymal ground glass appearance and a cavitating lesion in the left lung eroding into the fundus of stomach through the diaphragm (Figure 4). Bronchoscopy showed extensive thick mucopurulent secretions and collapsed bilateral upper lobes. Broncho-alveolar lavage showed *Klebsiella pneumonia* sensitive to colistin and imipenem. Staining and culture for mycobacterium tuberculosis was negative. An upper GI endoscopy was carried out which confirmed the presence of a communication between the stomach and lower lobe of left lung.

Figure 3: Chest x-ray showing now non homogenous opacification of the left hemithorax at the time of current admission.

The patient was made NPO and an NG tube was passed. An urgent general and thoracic surgical consult was sought and the patient was planned for combined thoraco-abdominal repair of the evident gastropulmonary fistula once the dialysis was completed and patient was transfused with blood. Unfortunately, the patient progressively became hemodynamically unstable despite inotropic support and was unable to maintain oxygen saturation despite high flow oxygen for which he was intubated and put on

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mechanical support. Despite these measures he was unable to maintain oxygen saturation and blood pressures and expired.

Figure 4: **A)** HRCT chest showing huge irregular cavity in left lower lobe which is seen eroding the left hemi diaphragm and communicating with gastric lumen **B)** HRCT Chest showing extensive fine nodular infiltration in both lungs with fairly generalized ground glass haze. Left lower lobe shows extensive collapse/consolidation with internal cystic and bronchiectatic change.

Discussion:

Gastropulmonary fistulas are a very rare clinical entity.³ Most cases of gastro pulmonary fistula occur in patients with one or more of the following risk factors: surgery and/or trauma to the gastro-intestinal tract or abdomen, perforated gastric ulcers, a history of recurrent or prolonged pulmonary infections, malignancy, and radiation therapy.⁴ In our literature search we were unable to find any case or association between *Klebsiella* infections & gastro pulmonary fistulas.

Klebsiella pneumoniae is one of the most common gram-negative bacteria encountered by physicians particularly in solid organ transplantation, with immunosuppressant therapy, mechanical ventilation, prolonged use of invasive devices and use of antimicrobial agents.⁵ *Klebsiella* is known to cause extensive pulmonary necrosis and frequent cavitation.⁶

The risk factors for *Klebsiella pneumonia carbapenemase* in renal transplant patients are length of post-transplant hospital stay, delayed kidney function and clinical complications such as previous infectious episodes and invasive cytomegalovirus infection that led to invasive diagnostic procedures and greater use of antimicrobials during six months after the transplant.⁷

Our case is one of the rare diagnoses where an immunocompromised patient due to renal transplant developed recurrent chest infections leading to a gastro pulmonary fistula secondary to *klebsiella*

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pneumonia. Awareness of this uncommon complication will help diagnose this rare condition particularly in at risk patients.

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