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Case Report

Ralstonia pickettii-Infected Endocarditis Complicated with Possible Septic Emboli in Kidney: A Rare Case Report

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Abstract

Ralstonia pickettii, a non-fermenting gram-negative bacillus, is one of the opportunistic pathogens derived from environment and thus a rare cause of infective endocarditis. Accordingly, patients who were immunocompromised or had recent medical intervention prior to fever/chills should be carefully attended and assessed. Besides, concurrent septic emboli to multiple noncardiac organs may occur in infective endocarditis, including central nervous system, extremities, spleen, lung, kidney, bone and joint structures, liver, coronary vessels and others. Therefore, advanced imaging studies should be considered for diagnostic survey when septic emboli were suspected. Treatment for septic emboli in kidney is usually supportive. Here, we reported a rare case of *Ralstonia pickettii*-infected endocarditis complicated with septic emboli in the kidney.

Keywords: Infective Endocarditis; *Ralstonia pickettii*; Renal Septic Emboli

Introduction

Ralstonia pickettii, a non-fermenting gram-negative bacillus, is one of the opportunistic pathogens that cause infection from the environment [1]. Formerly named *Burkholderia pickettii*, the genus of *Ralstonia* was newly separated and categorized because of the difference of phenotypic and phylogenetic features, including composition of cellular lipid and fatty acid as well as DNA and 16s rRNA sequencing and hybridization [2]. Patients with *R. pickettii* infection could be ranged from asymptomatic to severe infection and death. According to the literature review, the most common situations relavant with *R. pickettii* infection are bacteremia and infections of respiratory tract [1,3-6]. Infective endocarditis is rarely caused by *R. pickettii*. Here, we reported a case of *R. pickettii*-infected endocarditis complicated with possible septic emboli in kidney.

Case Description

A 34-year-old male presented with intermittent fever up to 39-degree Celsius and chillness for 3 days and had a history of severe aortic insufficiency status post redo aortic valve replacement with mechanical valve. He then came to our emergency department for further assessment. There was no productive cough, sore throat, respiratory distress, abdominal pain, diarrhea, dysuria and skin rashes. The patient also denied histories of travelling, contact, and cluster as well as drug abuse. The laboratory examination revealed white cell count of 7,160/uL with neutrophilia of 81.3%, serum Aspartate Transaminase (AST) of 28 U/L, creatinine of 1.21 mg/dL (the baseline level of the patient ranged from 0.89-1.01mg/dL), lactate of 1.24mmol/L and C-Reactive Protein (CRP) of 10.21mg/dL. Urinalysis also revealed proteinuria and microscopic hematuria (protein: 1+, occult blood: trace; red cell: 9.3 per high power field). Three separated blood cultures were obtained for septic work-up. Transthoracic Echocardiography (TTE) was performed, revealing dilation of left ventricle and moderate mitral regurgitation without obvious vegetation over precordial view. The patient was then admitted, and empirical antibiotic treatment was given with ampicillin/sulbactam first.

After admission, Transesophageal Echocardiography (TEE)

was arranged and revealed the presence of vegetation in size of 1 x 0.5 cm underneath the aortic valve (Figure 1).

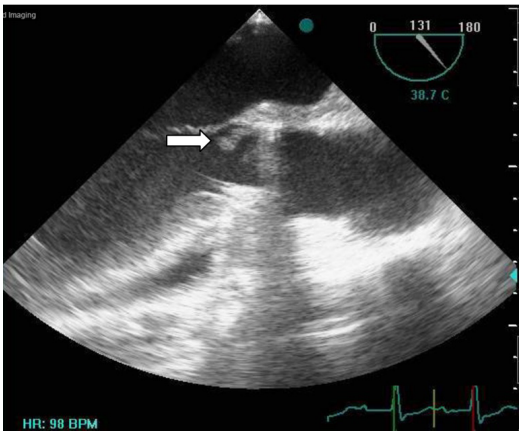

Figure 1: The vegetation was presented underneath the aortic valve, in size of 1 x 0.5 cm (arrow), in transesophageal echocardiography.

Abscess formation was also suspected at the aortic annulus. Previous blood cultures all yielded *R. pickettii* after 3-day incubation, which was resistant to ampicillin/sulbactam and ceftriaxone and sensitive to ciprofloxacin. Antibiotics were then shifted to ciprofloxacin plus vancomycin treatment. Pre-operative computed tomography of chest and abdomen revealed ground glass opacities with some patch densities and centrilobular nodules in right upper lobe and both lower lungs, accompanied with moderate bilateral pleural effusions and adjacent lung atelectasis. Inflammatory process was favored. Besides, a focal hypodense lesion in the lateral aspect of left kidney was noticed, possibly related to septic emboli (Figure 2).

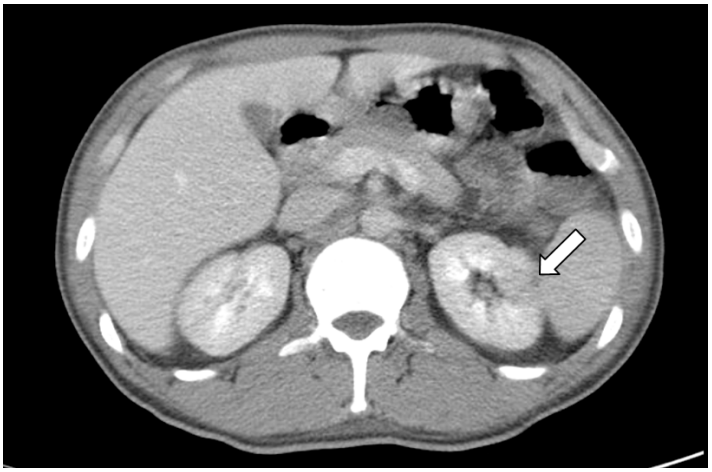

Figure 2: A focal hypodense lesion in the lateral aspect of left kidney (arrow) was noticed, possibly related to septic emboli.

The patient thus received surgical intervention in which the mechanical valve was removed and abscess at the aortic annulus was debrided. Aortic valve replacement was then performed with 23mm Hancock II porcine xenograft. Post-operative course was uneventful. The patient did not receive renal biopsy for further assessment and thereafter, the serum creatinine was decreased to 0.95-1.02mg/dL. After completion of antibiotic treatment, fever subsided, and he was then discharged.

Discussions

R. pickettii-associated endocarditis is unusual; and the virulence is thought to be low. Hence, it was not often sought in routine analysis of microbiological laboratories in medical centers. The first case was documented in 1968 [7]. Recently, two cases of *R. pickettii*-associated endocarditis were reported [8,9]. Since infection of *R. pickettii* was associated with contamination of medical solution used in patient care [1,6,10,11], it implied that patients who were immunocompromised or had recent medical intervention prior to fever/chills should be carefully attended and evaluated to exclude the possibility of infective endocarditis. Additionally, the clinical conditions concerning septic emboli were not presented among these cases reported before. It was reported that more than half of the patients with infective endocarditis complicated with septic emboli had Staphylococcus aureus infection [12]. To the best of our knowledge, this is the first case of *R. pickettii*-infected endocarditis in conjunction with septic emboli in kidney.

As one of the complications of infective endocarditis, septic emboli could increase the risk of mortality if not appropriately managed [13]. It was reported that embolic events could occur in 12-51% of the patients with infective endocarditis [13,14]. According to the literature review, the septic emboli most commonly affected the central nervous system (48-65%), follow by extremities (30%), spleen (19-32%), lung (14-25%), kidney (6-14%), bone and joint structures (11%), liver (3-11%), coronary vessels (6%) and other unspecified [10,13, 15-17]. The clinical presentations of renal septic emboli in infective endocarditis varied extensively. Patients with infective endocarditis in conjunction with septic emboli in the kidney may complain of fever, nausea, vomiting and abdominal, flank or back pain, which could be acute and constant. Besides, leukocytosis, proteinuria, hematuria and increase of Serum Lactate Dehydrogenase (LDH) could be found in laboratory data of these cases. Furthermore, renal septic emboli and infarction may occur in accompany with other septic emboli in multiple organs [18,19]. Hence, advanced imaging studies, such as Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) should be considered for diagnostic survey or monitoring the extent of complications when septic emboli were suspected in infective endocarditis. It was also suggested that renal biopsy could be helpful in patients with infective endocarditis in conjunction with renal impairment [12]. The most common lesion in kidney was localized infarct in infective endocarditis [12].

In addition to septic emboli and renal infarct, infective endocarditis may trigger Glomerulonephritis (GN), accompanied with reduction of C3 and C4 components as well as positivity of Antineutrophil Cytoplasmic Autoantibody (ANCA) [20]. It was also revealed that necrotizing and crescentic pattern (53%) and endocapillary proliferative pattern (37%) were the most two common types with prominent C3 deposition in infective endocarditis-induced GN [20]. The establishment of therapeutic strategies depended on the distribution of septic emboli. In infective endocarditis with renal septic emboli, treatment is usually supportive, including preservation of renal function and systemic antimicrobial therapy [10]. In the situation of infarctions or refractory infections, procedural interventions for septic emboli may be considered in infective endocarditis [21, 22].

In summary, *R. pickettii* is a rare cause of infective endocarditis. Consequently, patients who were immunocompromised or had recent medical intervention prior to fever/chills should be carefully attended and assessed to rule out the possibility of infective endocarditis. Besides, concurrent septic emboli to multiple noncardiac organs may occur in infective endocarditis, including central nervous system, extremities, spleen, lung, kidney, bone and joint structures, liver, coronary vessels and others. When septic emboli were suspected, advanced imaging studies should be considered for diagnostic survey. Treatment for septic emboli in kidney is usually supportive.

Author Contributions

Pin-Hao Huang and Hui-Chieh Kang contributed equally as the first co-authors. Fu-Chien Hsieh contributed as the corresponding author.

References

1. Ryan MP, Pembroke JT, Adley CC (2006) *Ralstonia pickettii*: a persistent gram-negative nosocomial infectious organism. J Hosp Infect 62: 278-284.

2. Yabuuchi E, Kosako Y, Yano I, Hotta H, Nishiuchi Y (1995) Transfer of two *Burkholderia* and an *Alcaligenes* species to *Ralstonia* gen. Nov.: Proposal of *Ralstonia pickettii* (Ralston, Palleroni and Doudoroff 1973) comb. Nov., *Ralstonia solanacearum* (Smith 1896) comb. Nov. and *Ralstonia eutropha* (Davis 1969) comb. Nov. Microbiol Immunol 39: 897-904.

3. Pan HJ, Teng LJ, Tzeng MS, Chang SC, Ho SW, et al (1992) Identification and typing of *Pseudomonas pickettii* during an episode of nosocomial outbreak. Zhonghua Min Guo Wei Sheng Wu Ji Mian Yi Xue Za Zhi 25: 115-123.

4. Fernández C, Wilhelmi I, Andradas E, Gaspar C, Gomez J, et al (1996) Nosocomial outbreak of *Burkholderia pickettii* infection due to a manufactured intravenous product used in three hospitals. Clin Infect Dis 22: 1092-1095.

5. Hagadorn JI, Guthrie E, Atkins VA, Devine CW, Hamilton L (1997) Neonatal aspiration pneumonitis and endotracheal colonization with *Burkholderia pickettii* following home water birth. Pediatrics 100: 506.

6. Labarca JA, Trick WE, Peterson CL, Carson LA, Holt SC, et al (1999) A multistate nosocomial outbreak of *Ralstonia pickettii* colonization associated with an intrinsically contaminated respiratory care solution. Clin Infect Dis 29: 1281-1286.

7. Graber CD, Jervey LP, Ostrander WE, Salley LH, Weaver RE (1968) Endocarditis due to a lanthanic, unclassified Gram-negative bacterium (group IV d). Am J Clin Pathol 49: 220-223.

8. Orme J, Rivera-Bonilla T, Loli A, Blattman NN (2015) Native Valve Endocarditis due to *Ralstonia pickettii*: A Case Report and Literature Review. Case Rep Infect Dis 2015: 324675.

9. Kharbouche K, Elhaddad I, Benhaourech S, Noureddine M, Habbal R (2016) *Ralstonia pickettii*: a rare cause of infective endocarditis. Arch Cardiovasc Dis Suppl 8: 64.

10. Wojda TR, Cornejo K, Lin A, Cipriano A, Nanda S, et al (2016) Septic Embolism: A Potentially Devastating Complication of Infective Endocarditis. Chapter 8. Dr. Michael Firstenberg (Ed.), InTech 2016.

11. Centers for Disease Control and Prevention (1998) Nosocomial *Ralstonia pickettii* colonization associated with intrinsically contaminated saline solution--Los Angeles, California, 1998. MMWR Morb Mortal Wkly Rep 47: 285-286.

12. Majumdar A, Chowdhary S, Ferreira MA, Hammond LA, Howie AJ, et al (2000) Renal pathological findings in infective endocarditis. Nephrol Dial Transplant 15: 1782-1787.

13. Millaire A, Leroy O, Gaday V, de Groote P, Beuscart C, et al (1997) Incidence and prognosis of embolic events and metastatic infections in infective endocarditis. Eur Heart J 18: 677-684.

14. Colen TW, Gunn M, Cook E, Dubinsky T (2008) Radiologic manifestations of extra-cardiac complications of infective endocarditis. Eur Radiol 18: 2433-2445.

15. Ting W, Silverman NA, Arzouman DA, Levitsky S (1990) Splenic septic emboli in endocarditis. Circulation 82: 105-109.

16. Hoen B, Alla F, Selton-Suty C, Béguinot I, Bouvet A, et al (2002) Changing profile of infective endocarditis: results of a 1-year survey in France. JAMA 288: 75-81.

17. Luaces Méndez M, Vilacosta I, Sarriá C, Fernández C, San Román JA, et al (2004) Hepatosplenic and renal embolisms in infective endocarditis. Rev Esp Cardiol 57: 1188-1196.

18. Caraballo V (1997) Fatal myocardial infarction resulting from coronary artery septic embolism after abortion: unusual cause and complication of endocarditis. Ann Emerg Med 29: 175-177.

19. Grob A, Thuny F, Villacampa C, Flavian A, Gaubert JY, et al (2014) Cardiac multidetector computed tomography in infective endocarditis: a pictorial essay. Insights Imaging 5: 559-570.

20. Boils CL, Nasr SH, Walker PD, Couser WG, Larsen CP (2015) Update on endocarditis-associated glomerulonephritis. Kidney Int 87: 1241-1249.

21. Kitts D, Bongard FS, Klein SR (1991) Septic embolism complicating infective endocarditis. J Vasc Surg 14: 480-485.

22. Misawa S, Sakano Y, Muraoka A, Yasuda Y, Misawa Y (2011) Septic embolic occlusion of the superior mesenteric artery induced by mitral valve endocarditis. Ann Thorac Cardiovasc Surg 17: 415-417.