中文題目：腹膜透析病患 *Prevotella* 相關感染：病例報告分析

英文題目：*Prevotella-related Infections in Peritoneal Dialysis Patients: A Case Series*

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Background

Patients undergoing peritoneal dialysis (PD) have a high risk of developing infection involving the catheter exit site, subcutaneous tunnel, and peritoneum. While most infections are caused by skin commensals, the rising incidence of atypical organisms should be noted. Exit-site infections (ESI) involving *Staphylococcus aureus* and *Pseudomonas aeruginosa* are often associated with concomitant tunnel infections (TI), eventually resulting in peritonitis.[1] The following two patients both had an ESI that developed into a TI due to *Prevotella disiens*.

Case 1

A 63-year-old female with end-stage renal disease (ESRD) due to chronic interstitial nephritis was under continuous ambulatory peritoneal dialysis (CAPD). During one of her visits, which was three months prior to admission, she presented with pus formation around the catheter exit-site caused by *Corynebacterium striatum* and *Streptococcus constellatus*. Topical fusidic acid was used, but persistent pus discharge was still observed. Hospitalization was recommended. Upon admission, intravenous vancomycin was inititated based on the previous pus culture test results. The peritoneal fluid analysis revealed a white blood cell count of 1/μL. The ultrasound reported thickening of the soft tissue and increased vascularity surrounding the dialysis tunnel pathway, indicating infection. On day four, aerobic pus culture revealed the presence of *S. constellatus* and *S. intermedius*. On day seven, the anaerobic pus culture yielded *P. disiens*. Metronidazole was added to the treatment. Due to refractory catheter infection, catheter removal was performed on day nine. The operative wound became cleaner and the discharge gradually decreased. Antibiotics were used for two more weeks after catheter removal. No further signs of infection were noted during follow-up.

Case 2

A 55-year-old female with ESRD was under CAPD for 8 years. She was admitted in another hospital due to pus formation around the catheter exit-site and received metronidazole. However, the patient responded poorly to the treatment. Anaerobic pus culture revealed the presence of *P. disiens* and metronidazole was used.

Due to persistent pus discharge after more than one month of treatment, she came to the hospital for a second opinion and was admitted. Treatment was started using a combination of vancomycin plus piperacillin-tazobactam. An allergic reaction with skin rash was noted on day two. Therefore, the antibiotic treatment was switched back to metronidazole. The peritoneal fluid analysis revealed a white blood cell count of 1/μL. The ultrasound reported an irregular hypoechoic mass measuring 5.5 cm at the dialysis tunnel, indicating abscess formation. Since both infections at the exit-site and tunnel still persisted after treatment, catheter removal was performed on day eight, as well as draining the abscess. No further signs of infection were noted in the laboratory data during follow-up.

Discussion

1. Uncommon organisms, including fungus, mycobacteria, and anaerobic pathogens, must be considered for ESI refractory to standard antibiotic treatment.
2. The *Prevotella* species are a group of anaerobic gram-negative bacteria residing in the oral, vaginal, and gut microbiota.
3. Previous studies of the gut microbiota showed that *Prevotella* is more commonly seen in people who eat a plant-rich diet, which can also be observed in both of the cases who preferred to eat vegetables.[2]
4. Studies have found that the increased abundance of *Prevotella* and specific strains were associated with inflammation.[3]
5. The risk factors for anaerobic infection include: male, increasing age, prior cancer, chronic diseases of the liver, heart, and kidney, diabetes mellitus, stroke, etc.[4]
6. Both patients are female and non-diabetic. No other specific disease aside from ESRD was identified
7. Peritoneal dialysis catheters in PD patients with and without infection were often found to be covered with microbial biofilm.[5] One study demonstrated that the *Prevotella* species has the ability to adhere in biofilm.[6]
8. Both patients received PD for more than 8 years. Long-term PD may be a risk factor for anaerobic infections.
9. Two other case reports described PD-related infections caused by *Prevotella* species.[7,8] A comparison between cases can be seen in Table 1.
10. Topical fusidic acid, an antibiotic against gram-positive bacteria, is commonly used in clinical practice. Although it can decrease the incidence of common bacterial infections, it may aggravate the growth of atypical microorganisms, such as anaerobic bacteria.[9]

11. Another possible reason of treatment failure in the cases was the relatively short duration of the anti-anaerobic antibiotic treatment. Anaerobic infections generally require longer treatment duration (up to 6 to 8 weeks).

Conclusion

P. disiens, an unusual anaerobic bacteria with poor response to antibiotics, may cause ESI and TI, eventually leading to catheter removal in PD patients.

Table 1. Comparison of PD-related infection cases due to Prevotella species

Case	Species	Age	Gender	PD Duration	Infection	Antibiotics	Treatment Duration	Catheter Removal
Case 1	*P. disiens*	63 years old	Female	9 years	ESI and TI	Metronidazole	2 days	Yes
Case 2	*P. disiens*	55 years old	Female	8 years	ESI and TI	Metronidazole	2 weeks	Yes
Millán Díaz, B. et al. (2018)[7]	*P. oralis*	50 years old	Male	9 years	Peritonitis	IP Imipenem	15 days	No
Wong, Y. T. et al. (2019)[8]	*P. nigrescens*	80 years old	Male	4 years	Peritonitis with abscess	Metronidazole	6 weeks	No

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