

***Pseudomonas aeruginosa* infective endocarditis and biofilm challenges: Confronting the barriers**

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ABSTRACT

Introduction: Infective endocarditis (IE) caused by *Pseudomonas aeruginosa* (*P. aeruginosa*) is extremely uncommon. It occurs in about 3% of the cases of endocarditis. Although antibiotic therapy is generally successful, treating *P. aeruginosa* infections associated with biofilms poses significant challenges. In this study, we present a case of *P. aeruginosa* infective endocarditis that proved difficult to treat, despite the strain showing no antibiotic resistance. **Case report:** A forty-five-year-old man with a history of intravenous drug abuse presented with a fever and lethargic. The physical examination at the presentation is unremarkable. Laboratory investigation reveals elevated septic parameters alongside leukocytosis and high CRP levels. A blood culture taken revealed *P. aeruginosa* which was susceptible to all tested antibiotics. After one week on IV Piperacillin/ tazobactam (Tazosin), patient showed no clinical improvement and complaining of palpitations. During the cardiac examination, a pansystolic murmur was detected. Subsequent echocardiography (ECHO) confirmed vegetation on the tricuspid valve associated with severe tricuspid regurgitation. Then, he was treated as IE based on Duke major criteria. The antibiotic treatment was intensified with IV Meropenem. However, his blood cultures repeatedly isolated *P. aeruginosa* throughout his two months admission, and the vegetation on the tricuspid valve enlarged to 4 cm. Therefore, the patient was referred to the cardiothoracic surgery team and underwent valve repair surgery due to the failure of medical therapy and the presence of persistent vegetation larger than 2 cm. **Discussion/Conclusion:** The intricate composition of *P. aeruginosa* biofilms enhances its pathogenicity by promoting resistance to treatment. This complex structure, consisting of exopolysaccharides, DNA, and proteins, acts as a barrier that prevents both the body's immune response and antimicrobial medications from effectively penetrating it. Consequently, this barrier facilitates the establishment of chronic infections that are highly resilient to elimination. This aspect of biofilm formation explains the clinical challenges encountered in managing *P. aeruginosa*-related Infective Endocarditis.