PROPIONIBACTERIUM ACNES INFECTIVE ENDOCARDITIS AFTER TERMINATION OF PREGNANCY DUE TO FETAL DEATH IN UTERO: A CASE REPORT AND REVIEW

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Abstract

Infective endocarditis is an uncommon complication in obstetric and gynecologic settings. Most reported cases in the literature have been caused by streptococci, enterococci, and gonococci. We have reported a case of infective endocarditis caused by Propionibacterium acnes in a 30-year-old woman who developed infective endocarditis following the termination of pregnancy due to intra-uterine fetal death and placental abruption. Propionibacterium acnes belongs to the cutaneous flora of humans and is often considered a biological contaminant in clinical setting; however, it has been found to be the principal pathogen in many cases of documented serious infections; therefore, appropriate antibiotic treatment is mandatory before considering it a mere contaminant.

Key Words: Propionibacterium acnes, Infective endocarditis, Aortic insufficiency, Intra-uterine fetal death

Introduction

Propionibacterium acnes is a gram-positive, slow-growing anaerobic diphtheroid that is part of the normal microflora of the skin, conjunctivae, external ear, sebaceous follicles, mouth, and upper respiratory tract in humans.¹,³ Due to increasing number of documented reports that cite P. acnes as the principal pathogen in a variety of serious infections such as CNS shunt infections, endophthalmitis, pulmonary infections, osteomyelitis, and aortic aneurysms,⁴,⁵ it is therefore necessary to determine whether it is a contamination or an infection in the clinical setting. A review of the literature reveals that infective endocarditis caused by P. acnes is rare and is associated with the implantation of prosthetic valves,⁶-⁸ pacemakers,⁹,¹⁰ and annuloplasty rings.¹¹ The majority of infective endocarditis related to obstetric and gynecologic events are caused by viridans streptococci, enterococci, group B streptococci, staphylococci, and in rare instances, gonococci.¹²-¹⁶ We have reported a case of native valve infective endocarditis caused by P. acnes that was associated with obstetric complication. To the best of our knowledge, this is the first reported case of P. acnes endocarditis in the medical and/or obstetric literature.

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Case Report

A 30-year-old woman without any previous medical or surgical history was admitted with left lower leg swelling and pain for 2 days and low-grade fever that had persisted for 1 month. Thirty-five days before admission to our hospital, she presented with massive uterine bleeding and shock due to placental abruption and intrauterine fetal death at 34 weeks’ gestation. Due to the obstetric complication, a total abdominal hysterectomy was performed. She developed an intermittent low-grade fever 3 days after the operation. She received first-generation cephalosporin and gentamicin for 14 days, and then was discharged with oral cephalexin for another 7 days. However, the fever persisted while she was at home. Two weeks before admission, she returned to the same hospital with fever, chills, and right flank tenderness. Urinalysis revealed pyuria and microscopic hematuria; hence, she was treated with 1 gm rocephin every 12 h intravenously for 7 days and was discharged afebrile. Urine culture, abdominal sonography, and gallium-67 whole-body scan produced negative findings. Blood cultures yielded no microorganism growth after 7 days. Four days after she was discharged, she presented to our emergency department with high fever, left lower leg swelling with pain, and septic shock. Physical examination revealed an ambulatory patient with a limping gait. Her body temperature was 38.1°C; blood pressure was 120/60 mm/Hg. Her pulse was 128 bpm, and respiratory rate was 23 breaths/min. On auscultation, her lungs was clear, but a grade 2/6 early diastolic murmur over the aortic valve was heard. Abdominal examination was unremarkable, and pelvic examination revealed no vaginal discharge or cervical, adnexal, or uterine tenderness. No mass was palpated. There was pitting edema of the left foot with a positive Homans’ sign. Laboratory studies revealed mild leukocytosis of 11,580/mm^3, with ESR of 42 mm/h, CRP of 1.91 mg/dL, and LDH of 1055 IU/L. Urinalysis revealed microscopic hematuria without pyuria. She was admitted to the intensive care unit. Two sets of blood cultures were collected in the emergency room, and another 2 sets were collected in the intensive care unit on the day of admission. Another 2 sets were cultured on the second hospital day. VDRL was non-reactive. Anti-HIV (I and II), cardiolipin IgG, Well-Felix, and Widal titers were insignificant. Pelvic and femoral vessel sonography revealed the absence of venous flow, with engorgement of the left common iliac and external iliac veins compatible with deep vein thrombosis. Doppler flowmetry revealed abnormal thrombus formation with occlusion of the left femoral and popliteal veins. The lung scan was normal. Transesophageal echocardiography (Fig. 1) revealed moderate aortic regurgitation, and a small vegetation over the lateral cusp of the aortic valve was noted. A cardiologist and cardiovascular surgeon were consulted, and it was decided that medical treatment with heparin and antibiotics should be initiated first with close follow-up of the clinical course. Surgical intervention would have been carried out if the medical treatment failed or if signs of heart failure developed. She was treated with heparin and intravenous penicillin combined with gentamicin. None of the blood cultures exhibited microbial growth after 7 days of incubation. However, on the ninth hospital day, 4 of 6 sets yielded \textit{P. acnes} growth. Antibiotics were changed to intravenous amoxicillin + clavulanate acid at 1.2 gm every 6 h. Heparin was changed to coumadin. One week after this treatment, she became afebrile and the left lower leg swelling had resolved.
disappeared. Subsequent blood cultures repeated separately at 2 weeks and 1 month after the treatment were sterile. She was discharged on hospital day 53, and follow-up at the cardiology outpatient department disclosed the disappearance of the cardiac vegetation and deep vein thrombosis.

**Discussion**

*Propionibacterium acnes* isolates are rarely associated with infection and are often considered a contaminant in blood and tissue cultures; however, these organisms can cause serious infection, and mortality is relatively high.\(^{17,18}\) Jakab et al reported that the predominant predisposing factors were surgery, implantation of foreign bodies such as prosthetic heart valves, intraocular lenses, and ventriculoperitoneal shunts.\(^{19}\) Brook\(^{20}\) reviewed 36 patients with *P. acnes* endocarditis and found that 14 cases (42.4%) involved native valves, 16 (48.5%) were associated with prosthetic valves, and 3 (9.1%) were associated with other intracardiac prosthetic material. Lalani et al\(^{21}\) reviewed 15 patients with *P. acnes* endocarditis using the International Collaboration on Endocarditis Merged Database and reported that 11 of 15 patients were male with a mean age of 52 years. Prosthetic valve endocarditis occurred in 13 of 15 cases, and 3 had a history of congenital heart disease. Most patients were treated with β-lactam antibiotics alone or in combination for 4–6 weeks. Ten of 15 patients underwent valve replacement surgery, and 2 patients died. Although *P. acnes* has low virulence, its infection can pursue a very aggressive clinical course, involving severe valvular destruction, congestive heart failure, extensive abscess formation, and systemic embolization.\(^{6,8,18,22}\) Intracardiac abscess was encountered in 28.6% of native valve endocarditis and in 52.9% of prosthetic valve endocarditis caused by *Propionibacterium* species. Most (70%–80%) required surgical intervention.\(^{18-20}\) Therefore, prompt diagnosis and treatment with appropriate antibiotic therapy are essential. Delayed institution of appropriate therapy may contribute to the complications mentioned above. The indolent clinical course, negative or delayed culture results, and tendency to consider this organism a contaminant in blood culture often delays the treatment. The subtle symptoms and slow growth of the organism in vitro made the diagnosis more difficult. It is difficult to recover this organism from blood cultures if optimal anaerobic culture procedures have not been employed. The average time for the organism to grow is 7 days, and prolonged aerobic and anaerobic cultures of blood/tissue of up to 3 weeks may be required to detect the organism.\(^{22}\) While there are no clinical trials to guide the treatment of *Propionibacterium* infections, many antibiotics, including penicillins, vancomycin, teicoplanin, and gentamicin, are considered active in vivo and have been reported to be successful in the treatment of endocarditis.\(^{23}\)

Considering the risk factors mentioned above, we have reported a 30-year-old woman who had no history of congenital heart disease or illicit drug abuse, nor had she undergone prosthetic valve replacement surgery. She developed bacterial endocarditis after an obstetric complication due to intrauterine fetal death and placental abruption.

A pelvic infection such as endometritis was the most probable source of infection in this patient. To our knowledge, no case of *P. acnes* endocarditis under obstetric or gynecologic conditions has been reported in the English literature. This case illustrates the importance of recognizing the pathogenic potential of *P. acnes* in non-prosthetic valves in obstetric patients. Often, blood cultures are discarded when there is no microbial growth after 7 days of culture, producing false negative results and underestimating the prevalence of *Propionibacterium* endocarditis. Pan et al\(^{24}\) re-emphasized that *P. acnes* can be a true pathogen in patients with implanted prosthesis. They suggested that when *P. acnes* is isolated from blood, amplification and sequencing of the 16S rDNA and RAPD are promising tools for identifying the pathogen and determining the persistence of *P. acnes* bacteremia, which implies the diagnosis of infective endocarditis.
Conclusion

This case report described a rare instance of *P. acnes* endocarditis involving a native valve that occurred following a termination of pregnancy due to intrauterine fetal death and placental abruption. Appropriate heparin and antibiotic therapy resulted in full recovery of the patient, with complete resolution of the vegetation and deep vein thrombosis without surgical intervention. In this case report, we emphasize that *P. acnes* is a slow-growing anaerobe, often requiring 7–14 days for identification; hence, a negative blood culture should not be disregarded before 14 days in patients suspected to have endocarditis, and blood cultures in which *P. acnes* grow should not be dismissed as contaminated without first considering the clinical circumstances.

References

子宮內死胎引起感染性心內膜炎—病例報告

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摘要

感染性心內膜炎是婦產科罕見的併發症。文獻報告的感染性心內膜炎最常見的細菌是綠色鏈球菌 (streptococcusviridans)，腸球菌 (enterococcus)，和淋球菌。在此報告我們一位三十歲女士在發病前妊娠三十四週時發現胎盤早期剝離導致胎死腹中，產道大量出血。痤瘡桿菌 (Propionibacterium acnes) 是一種生長相對緩慢的典型革蘭氏陽性厭氧菌 (桿狀)，平時即存在於人體毛囊中，是與肌膚共存的常在菌落，正常情況下，並不會危害人體。但是，一些研究報告指出在臨床上有些嚴重感染症主要病因是痤瘡桿菌 (Propionibacterium acnes) 故不能當作正常菌落或純粹污染必需使用適當抗生素治療。

關鍵詞：痤瘡桿菌 (Propionibacterium acnes)，感染性心內膜炎，主動脈閉鎖不全，子宮內死胎

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