DOI: https://doi.org/10.59255/mmed.2024.93

Unique report of endocarditis by *Priestia megaterium*

Relato de caso de endocardite por *Priestia megaterium*

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ABSTRACT

Endocarditis is a serious infection associated with significant morbimortality and can be caused by several microorganisms, most frequently by *Enteroccus faecalis*, *Staphylococcus aureus* and *Streptococcus sp*. Managing patients with severe infective endocarditis is particularly challenging in non-tertiary hospitals. A 26-year-old immunocompetent male was admitted to the hospital with a sudden onset of nausea, followed by a 10-second episode of syncope with unresponsiveness and memory loss. He was submitted to a magnetic resonance of the skull, revealing multiple intraparenchymal nodular lesions with an inflammatory/infectious process. Transesophageal echocardiogram showed prolapse of mitral valves with moderate/severe insufficiency. Eccentric, intense and triangular jet, directed towards the posterior region of the left atrium, with reverse systolic flow in the pulmonary veins. An anomalous, mobile image of 2.6cm x 0.6cm was observed, adhered to the atrial surface of the posterior leaflet of the mitral valve. Sliding of the posterior leaflet over the anterior leaflet is also noted, with an image compatible with partial rupture of the mitral chordae of the posterior leaflet. Antimicrobial empiric therapy with ampicillin, oxacillin, and gentamicin was prescribed. The patient underwent mitral valve replacement with a biological prosthesis. Valve tissue culture results identified *Priestia megaterium*, and the treatment was replaced by vancomycin, whereas gentamicin was kept. After 14 days, all symptoms were resolved, and the patient was discharged from the hospital. To the best of our knowledge, this is the first report of endocarditis driven by *P. megaterium*, and the pathogenic potential of *P. megaterium* warrants be further investigation.

Keywords: Endocarditis, *Priestia megaterium*, treatment.

RESUMO

Endocardite é uma infecção grave associada a morbimortalidade importante e pode ser causada por vários microrganismos, mais frequentemente por *Enteroccus faecalis*, *Staphylococcus aureus* e *Streptococcus sp.* O tratamento de pacientes com endocardite infecciosa grave é particularmente desafiador em hospitais não terciários. Um homem imunocompetente de 26 anos foi internado no hospital com início súbito de náusea, seguido por um episódio de síncope de 10 segundos com falta de resposta e perda de memória. Ele foi submetido a uma ressonância magnética do crânio, revelando múltiplas lesões nodulares intraparenquimatosas com um processo inflamatório/infeccioso. O ecocardiograma transesofágico mostrou prolapso de valva mitral com insuficiência moderada/severa. Jato excêntrico, intenso e triangular, com direção à região posterior do átrio esquerdo, com fluxo sistólico reverso em veias pulmonares. Foi observada também imagem ecoanômala, com ampla mobilidade, medindo 2,6cm x 0,6cm, aderida à face atrial do folheto posterior da valva mitral. Notou-se por fim deslizamento do folheto posterior sobre o folheto anterior, compatível com ruptura parcial da cordoalha mitral do folheto posterior. Foi realizada terapia antimicrobiana empírica com ampicilina, oxacilina e gentamicina. O paciente foi submetido à substituição da valva mitral por uma prótese biológica. Os resultados da cultura do tecido valvar identificaram *Priestia megaterium* e o tratamento antimcrobiano foi substituído por vancomicina e gentamicina foi mantido. Após 14 dias, todos os sintomas foram resolvidos e o paciente recebeu alta do hospital. Até o momento, este é o primeiro relato de endocardite por *P. megaterium* e o potencial patogênico de *P. megaterium* justifica uma investigação mais aprofundada.

Palavras-chave: Endocardite, *Priestia megaterium*, tratamento.

INTRODUCTION

Endocarditis is a serious infection associated with significant morbimortality, with death rates varying from 15% to 30%[1]. It can be caused by various microorganisms, including *Staphylococcus aureus*, coagulase-negative staphylococci, enterococci, *Haemophilus spp*., *Aggregatibacter spp*., *Cardiobacterium spp*., *Eikenella spp*. or *Kingella spp*.[2–4] or less common pathogens including pneumococci, *Candida spp*., gram-negative bacilli, and polymicrobial organisms. The usual treatment relies on bactericide antibiotics and its success depends on the complete eradication of the microorganism. Here, we describe a case of endocarditis driven by *Priestia megaterium* in a 26-year-old patient.

CASE REPORT

A 26-year-old immunocompetent male was admitted in the hospital with sudden onset of nausea, followed by syncope for 10 seconds of unresponsiveness and memory loss. The patient reports being smoker and user of marijuana and cocaine. The only clinic signs were a mitral murmur 2+/6+ and edema of the lower limbs. Blood count reveled hemoglobin 14 g/dL, 13,000 white blood cell count (N = 9,390/mm3) and 378,000 platelets/mm^3. He was submitted to magnetic resonance of the skull, which showed multiple intraparenchymal nodular lesions, including one of 1.7 cm in the right insular region, and another of 1.8 cm in the right cerebellar hemisphere, compatible with an inflammation/infection (Figure 1). The current cerebrospinal fluid showed 30 cells (lymphocytes 90%; neutrophils

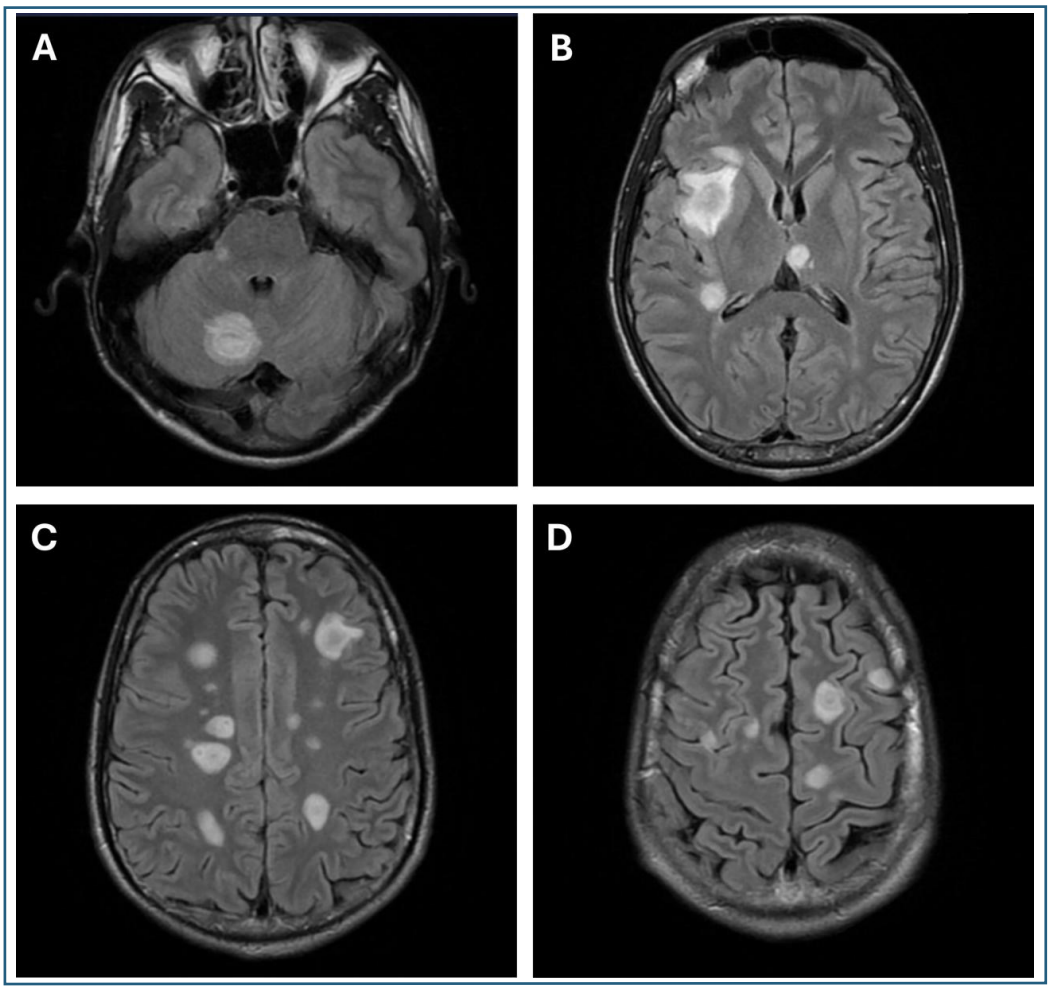

Figura 1. Magnetic resonance of the skull showing multiple intraparenchymal nodular lesions (A-D), compatible with an inflammation/infection.

10%), protein 58 mg/dl and glucose 43 mg/dl. Brain magnetic resonance found lesions compatible with brain abscesses, and septic embolism was considered. Transesophageal echocardiogram (TEE) suggested prolapse of mitral valves with moderate/severe insufficiency. Eccentric, intense and triangular jet, directed towards the posterior region of the left atrium, with reverse systolic flow in the pulmonary veins. An anomalous, mobile image of 2.6 cm x 0.6 cm was observed, adhered to the atrial surface of the posterior leaflet of the mitral valve. Sliding of the posterior leaflet over the anterior leaflet is also noted, with an image compatible with partial rupture of the mitral chordae of the posterior leaflet. The images suggest infective endocarditis according to modified Duke criteria[5]. Therefore, ampicillin, oxacillin and gentamicin were promptly prescribed. The patient underwent mitral valve replacement with a biological mitral prosthesis 24 hours after TEE. The extensive vegetation was visualized during cardiac surgery in the posterior leaflet and another attached to the wall of the left ventricle, below the posterior leaflet. The post-surgical TEE showed well-implanted prosthesis. Antimicrobial therapy was maintained until the valve tissue culture results identified *Priestia megaterium*. The treatment was then replaced by vancomycin. After 14 days all symptoms were resolved and the patient was discharged from the hospital.

The individual in this manuscript has given written informed consent to publish these case details, and local Ethical Committee has approved this study under CAAE number 77246124.6.0000.0329.

DISCUSSION

Infectious endocarditis has a high morbimortality[1]. The main risk factors are bacterial colonization of a surface and/or cardiac structure, the presence of bacteremia, using as a gateway mainly infections of the skin, oral cavity, gastrointestinal tract or genitourinary system; direct inoculation through the skin in injectable drug users or through unsafe vascular puncture or without adequate protection; and a variety of invasive diagnostic or therapeutic procedures. The main positive blood cultures are for *Enteroccus faecalis*, *Staphylococcus aureus* and *Streptococcus sp*.[2,3]. Slow growth and/or in latency stage of the pathogen present in vegetations and biofilms may become them more tolerant to effect of the antibiotics[6].

Priestia megaterium is a non-pathogenic bacteria found mainly in soil. To date, we found only 5 reports which *P. megaterium* was associated to any disease in humans. The first case we found was reported in 2006, which infection occurred after a corrective eye surgery[7]. Five years later, authors reported a patient presenting a primary cutaneous infection likely caused by skin microabrasions[8]. The third case was reported in a woman with an infectious brain abscess[9]. Crisafulli et al. reported a case of a patient with pleural effusion caused by *P. megaterium*[10], and the last report was an infection in soft tissues[11]. In all cases there was performed antibiotic therapy, and the symptoms were solved after the treatment.

To the best of our knowledge, this is the first reported case in the literature involving *Priestia megaterium* infection in endocarditis. Due to its indolent growth, *P. megaterium* low growth led to a gradual course of the disease, allowing that the management was performed on time. This was able to grant the success of the treatment and the bacteria eradication. In conclusion, we added a piece of evidence of a bacteria described as non-pathogenic was able to infect the heart structures of a patient, causing important vegetations. Therefore, the pathogenic capacity of *P. megaterium* should be further reinvestigated.

ACKNOWLEDGEMENT

LTB is recipient of Fundação de Amparo A Pesquisa do Estado de São Paulo (FAPESP) grant number 2021/14253-4.

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Recebido: 04.09.2024
Aceito: 25.11.2024
Publicado: 20.12.2024