Case Report

Infective Endocarditis with a Giant Vegetation (84 mm) on the Mitral Valve

Endocardite infecciosa com vegetação gigante (84 mm) na valva mitral

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Submitted: 07 July 2026
Accepted: 08 August 2026
Published: 18 August 2026

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DOI: 10.66004/2764-734X.e20260883-en

ABSTRACT

A 71-year-old man with a history of a biological mitral valve prosthesis implanted 20 years ago due to rheumatic fever sequelae sought medical attention presenting with fever, chills, and mental confusion for one day. Infectious screening exams revealed an 84 mm filiform vegetation attached to the prosthetic valve, extending into the left ventricle, whose contractions occasionally projected it through the aortic valve. Blood cultures grew *Streptococcus dysgalactiae*. Antibiotic therapy was followed by a successful valve replacement surgery, though not without clinical complications. This is one of the largest sizes of an infectious mitral valve vegetation described in the literature to date.

Headings: Endocarditis Bacterial. Heart Valve Prosthesis. Mitral Valve. Echocardiography Transesophageal. Streptococcal Infections. Case Report.

RESUMO

Um homem de 71 anos com histórico de ter uma bioprótese de valva mitral implantada há 20 anos por sequela de febre reumática procurou atendimento médico com quadro de febre, calafrios e confusão mental há um dia. Submetido a exames de triagem infecciosa, constatou-se uma vegetação filiforme de 84 mm aderida à prótese valvar que se estendia para dentro do ventrículo esquerdo, cujas contrações por vezes a projetava através da valva aórtica. Houve crescimento em hemoculturas de *Streptococcus dysgalactiae*. O tratamento com antibióticos foi seguido de uma bem sucedida intervenção cirúrgica para troca da valva, embora não isenta de complicações clínicas. Este é um dos maiores tamanhos de vegetação infecciosa na valva mitral descritos na literatura até o momento.

Descritores: Endocardite Bacteriana. Próteses valvulares cardíacas. Valva mitral. Ecocardiografia Transesofagiana. Infecções Estreptocócicas. Relato de Caso.

INTRODUCTION

Infective endocarditis is a severe infection associated with high morbidity and mortality that demands early diagnosis. Echocardiographic evidence of an oscillating intracardiac lesion emerges as a major criterion for its clinical diagnosis, with this vegetation being composed of fibrin, platelets, and microorganisms embedded within an inflammatory matrix. [1-3] Progressive vegetation growth can occur as a result of persistent fibrin and platelet deposition, high microbial load, diagnostic delay, and turbulent blood flow across previously damaged valves. [2,3]

Reports of very large vegetations are scarce, possibly because international guidelines recommend immediate surgical intervention in cases exceeding 10 mm in size, precisely due to their

higher risk of blood flow obstruction, embolization, and valve dysfunction. [1,2]

We present a case of infective endocarditis associated with an extremely long (84 mm) vegetation.

CASE REPORT

A 71-year-old man was transferred from another hospital to our intensive care unit with a one-day history of fever, chills, and mental confusion. His only notable medical history was a biological prosthesis implanted in the mitral position 20 years prior due to rheumatic fever sequelae. Initial blood tests were collected (hemoglobin 7.3 g/dL, leukocytes 10,100/µL, C-reactive protein 17 mg/L—reference value up to 6 mg/L), including two sets of blood cultures, followed by computed tomography scans of the head (normal for age) and chest (pulmonary congestion).

Due to his cardiac history, a transthoracic echocardiogram was indicated, which identified a mobile, laminar image fixed to the mitral prosthesis, measuring 47 mm at its largest diameter and associated with a paravalvular leak (prosthetic escape). A transesophageal echocardiogram was then performed, which identified the same echogenic, filamentous, and mobile image attached to one of the leaflets of the mitral prosthesis, but better delineated as being 84 mm in length, allowing it to intermittently enter the left ventricular outflow tract during some heartbeats (Figure 1).

Empirical treatment for infective endocarditis was initiated with ampicillin, ceftriaxone, and gentamicin, and surgical treatment for prosthetic valve replacement was immediately indicated, though initially refused by the patient and his family. A new set of blood cultures was collected on the third day of hospitalization, at which time the growth of *Streptococcus dysgalactiae* in the first two samples was reported. The susceptibility test demonstrated that this bacterium was sensitive to penicillin (minimum inhibitory concentration less than or equal to 0.12 µg/mL), ceftriaxone, and vancomycin, leading to the discontinuation of ampicillin, continuation of gentamicin until the 14th day, and maintained administration of ceftriaxone for six weeks. The two samples collected for blood culture on the third day and another set collected on the seventh day of antibiotic therapy showed no growth.

Surgical replacement of the mitral bioprosthesis with a mechanical valve occurred on the eighth day of admission without complications—no intraoperative samples were collected for histopathological or microbiological analysis. The patient developed complications due to the use of coumarins (hematuria and prolonged coagulation time), as well as a vertiginous syndrome and prolonged diarrhea, but was discharged on the 50th day after hospital admission. He remained stable with no signs of infection and/or cardiac dysfunction during the first six months of outpatient follow-up at our service, at which point he returned to his city of origin.

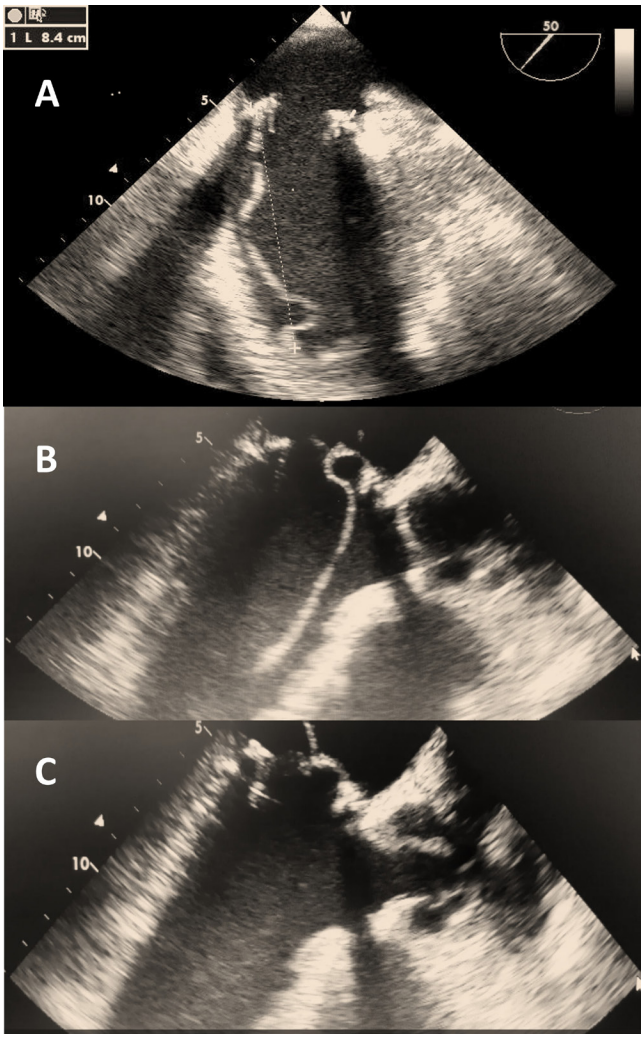

Figure 1: Images obtained by transesophageal echocardiography: mobile filamentous vegetation in the left ventricle measuring 84 mm along its major axis (A), anchored to the leaflet of the mitral bioprosthesis (B), and occasionally projecting through the aortic valve during the cardiac cycle (C).

DISCUSSION

This case is remarkable for the unusual size of the vegetation (84 mm), surpassing most previous reports of left-sided infective endocarditis (the most common type), which reached up to 70 mm.[4]

Radcliffe [5] published a review in 2020 of several cases of vegetations exceeding 40 mm, including the case of a female intravenous drug user whose autopsy identified a 100 mm vegetation bridging the mitral and tricuspid valves through a patent foramen ovale.[6] There is also a description of a 90 mm right-sided vegetation on a tricuspid valve bioprosthesis, also in an intravenous drug user.[7]

Regarding the etiological agent reported here, the 2018 study by Bläckberg [8] describes the clinical presentation and outcome of a series of 50 cases of endocarditis caused by *S. dysgalactiae*: elderly men were the most affected patients, and in general, the disease runs an aggressive course, manifesting with an acute onset that frequently progresses to organ dysfunction, with a high risk of embolization.

According to a meta-analysis [9] involving publications that reported cases of streptococcal bacteremia differentiated by species (14,183 *Streptococcus* sp. isolates) and the respective estimated risk of infective endocarditis (1,028 cases), *Streptococcus dysgalactiae* is among the most common pathogens causing the disease in absolute terms, recording 86 cases in total in the study. However, the presence of this bacterium in the blood (bacteremia) represents a low individual risk for developing endocarditis, around 6%. This finding suggests that species-specific endocarditis risk is a biological property and not necessarily a diagnostic characteristic of the patient population,[9] reinforcing the paradoxical relationship between highly virulent pathogens like *S. pneumoniae* and *S. pyogenes*—classic causes of sepsis, but less so of deep infections such as endocarditis.

Among the most relevant factors in the immunopathogenesis of invasive *S. dysgalactiae* infections is the production of superantigens,[10] similar to those found in group A streptococci. These exotoxins stimulate an intense release of pro-inflammatory cytokines and promote massive activation of T cells. In the valvular microenvironment, this exacerbated inflammatory response accelerates the local coagulation cascade, justifying the massive and rapid deposition of fibrin and platelets which, in our case, certainly contributed to the disproportionate growth of the vegetation to reach a striking 84 mm.

In therapeutic terms, it is worth highlighting the *in vitro* synergism of penicillin and gentamicin against the isolated strains.[8] Recent European guidelines [11] reiterate empirical treatment of infective endocarditis with ampicillin and ceftriaxone associated with gentamicin (for native valves or prostheses implanted for more than one year), aiming for broad coverage of *Staphylococcus aureus*, *Streptococcus* spp., and *Enterococcus* spp. This recommendation was, in fact, the course of action taken in the case reported here, as well as after the agent was identified: based on the antibiogram, endocarditis caused by *S. dysgalactiae* (if the strains are fully susceptible, i.e., with a minimum inhibitory concentration of less than 0.50 µg/mL) allows for intravenous ceftriaxone monotherapy, maintained for six weeks in cases of a prosthetic valve.[11]

There are three main indications for cardiac surgery in this context: heart failure, uncontrolled infection, and prevention of septic embolization.[11] The timing of the operation can be classified as emergency (within 24 hours), urgency (within 3 to 5 days), or non-urgent (though during the same hospital stay). According to the aforementioned European guidelines, one of the main novelties [1] regarding the surgical treatment of infective endocarditis is not delaying cardiac surgery when indicated, even if the patient has already experienced neurological complications such as ischemic or hemorrhagic stroke (which, fortunately, was not the case). In our patient, the surgical indication was justified from the beginning by the absolute need to mechanically remove the valvular vegetation—the unavailability of the culture of this vegetation, however, does not allow us to ascertain with certainty whether the infection itself was cured solely due to antibiotic therapy.

CONCLUSION

This clinical case documents one of the largest mitral valve vegetations described in the medical literature, while offering the opportunity for a brief review of infective endocarditis facilitated by valvular bioprostheses and, above all, the role of *S. dysgalactiae* in this context.

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