

## CASE REPORT

### CLINICAL CASE

# *Streptococcus alactolyticus* Infective Endocarditis and Stroke in a Healthy Young Female



Swarna Chakrabarty, MBBS,<sup>a</sup> Tony K. Hiran, BS,<sup>a</sup> Arjun Sharma, DO, MS,<sup>a</sup> Divya Ratan Verma, MD, MS,<sup>b</sup> Fajun Wang, MD,<sup>c</sup> Mina M. Benjamin, MD, MSC,<sup>b</sup> Nongnooch Poowanawittayakom, MD, MPH<sup>d</sup>

### ABSTRACT

*Streptococcus bovis*/*Streptococcus equinus* complex includes the subspecies *Streptococcus alactolyticus*. The prevalence of systemic infection in humans with *S alactolyticus* is scarce. We present a case of infective endocarditis complicated with hemorrhagic and ischemic stroke in a healthy 31-year-old woman. (J Am Coll Cardiol Case Rep 2024;29:102355)  
© 2024 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

### HISTORY OF PRESENTATION

A previously healthy 31-year-old woman presented as a code stroke with right-sided facial droop, dizziness, and right-sided weakness in her extremities 24 hours before admission. Her vitals were blood pressure 125/77 mm Hg, pulse 112 beats/min, temperature 98.2°F, SpO<sub>2</sub> 98%. She had no peripheral stigmata of infective endocarditis (IE) other than grade III/VI holosystolic murmur appreciated over the cardiac apex without shifting of the point of maximal impulse.

### LEARNING OBJECTIVES

- To recognize IE in stroke patients with minimal delay in treatment.
- To formulate a treatment plan for IE with adherence to Infectious Diseases Society of America guidelines.
- To recommend appropriate surveillance for mild MVP to avoid complications.

### PAST MEDICAL HISTORY

The patient was undergoing outpatient workup for possible antiphospholipid antibody syndrome due to fatigue, but had no chronic medical conditions, surgeries, dental procedures, or intravenous drug use. She was told she had an insignificant mitral valve prolapse (MVP) after a transthoracic echocardiogram (TTE) 15 to 20 years ago.

### DIFFERENTIAL DIAGNOSIS

On the basis of the patient's initial presentation, our differential diagnosis included ischemic stroke and congenital aneurysm.

### INVESTIGATIONS

Head computed tomography scan showed acute-to-subacute infarct of the left middle cerebral artery (MCA) and moderate volume subarachnoid hemorrhage. Cerebral angiogram (**Figure 1**) showed

From the <sup>a</sup>Saint Louis University, St. Louis, Missouri, USA; <sup>b</sup>Division of Cardiology, Internal Medicine Department, Saint Louis University, St. Louis, Missouri, USA; <sup>c</sup>Division of Neurology, Neurology Department, Saint Louis University, St. Louis, Missouri, USA; and the <sup>d</sup>Division of Infectious Disease, Internal Medicine Department, Saint Louis University, St. Louis, Missouri, USA. The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the [Author Center](#).

Manuscript received October 9, 2023; revised manuscript received April 1, 2024, accepted April 2, 2024.

**ABBREVIATIONS  
AND ACRONYMS****ICA** = internal carotid artery**IE** = infective endocarditis**MCA** = middle cerebral artery**MR** = mitral regurgitation**MVP** = mitral valve prolapse**SBSEC** = *Streptococcus bovis*/  
*Streptococcus equinus* complex**TTE** = transthoracic  
echocardiogram

complete occlusion of the left MCA M1 segment and a saccular aneurysm of the left MCA bifurcation measuring  $5.6 \times 1.6$  mm. A left craniotomy revealed this was a pseudoaneurysm and pathology was consistent with mycotic aneurysm. This suspicion was confirmed with a positive blood culture for *Streptococcus alactolyticus*.

Brain magnetic resonance imaging identified scattered chronic infarcts bilaterally. Repeat angiogram demonstrated 2 cerebral aneurysms of the right internal carotid artery (ICA) and 1 of the left MCA cortical branch. TTE revealed a 13-mm mass attached to the mitral valve and severe mitral regurgitation (MR) with a posterolateral eccentrically directed jet with preserved biventricular function. This vegetation and positive blood culture for *S alactolyticus* were suggestive of IE.

Transesophageal echocardiography confirmed the findings of complex vegetation (Figure 2) of the lateral aspect of the A3 scallop of the anterior mitral valve leaflet, severe MR, elevated left atrial pressure, moderate left ventricular dilation, and severe left atrial dilatation. Electrocardiogram showed sinus tachycardia (Figure 3). Antiphospholipid antibody panel and lupus anticoagulant were all negative during admission.

**MANAGEMENT**

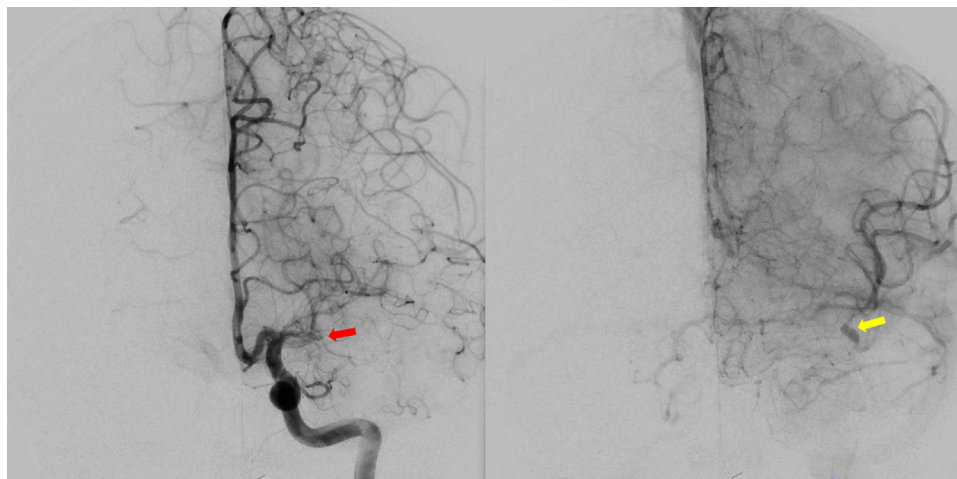
The patient was initially treated empirically with vancomycin, cefepime, and metronidazole. After a

positive blood culture for *S alactolyticus*, antibiotics were de-escalated to ceftriaxone. Once repeat blood cultures were negative, ceftriaxone was continued for 4 weeks according to Infectious Diseases Society of America guidelines.<sup>1</sup> Mitral valve replacement was deferred due to a recent hemorrhagic stroke and evidence of infarcts with potential hemorrhagic conversion. The ruptured left MCA pseudoaneurysm was treated with microsurgical resection and clipping. The subarachnoid hemorrhage was managed with close monitoring in the intensive care unit for neurological deterioration as well as prophylactic nimodipine and levetiracetam. The right ICA aneurysms were treated with antibiotics. The patient was advised to undergo colonoscopy because of the strong association between *Streptococcus bovis*/*Streptococcus equinus* complex (SBSEC) and colon cancer. However, the patient chose to defer colonoscopy as there were no additional symptoms suggesting colonic malignancy.

**DISCUSSION**

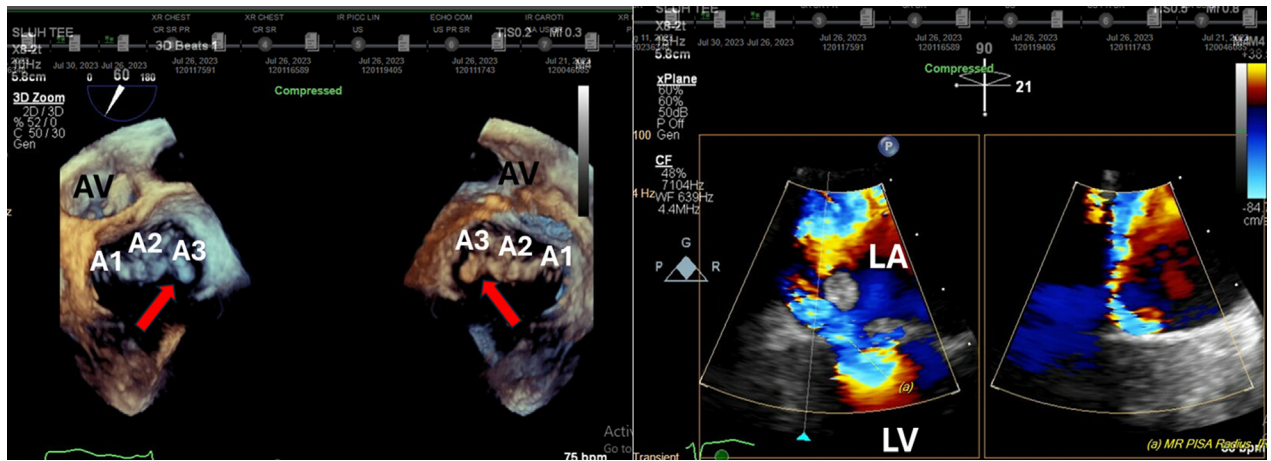
*S alactolyticus* is classified in the SBSEC group and is a subspecies of non-enterococcal group D Streptococci.<sup>2</sup> SBSEC commonly colonizes the gastrointestinal tract in humans and animals and is found in fermented food. *S alactolyticus* has been implicated in only 8 cases of human disease, 5 of which describe IE (Table 1).

This is the first case report of IE in a healthy young adult caused solely by *S alactolyticus*, and only the

**FIGURE 1** Cerebral Angiogram

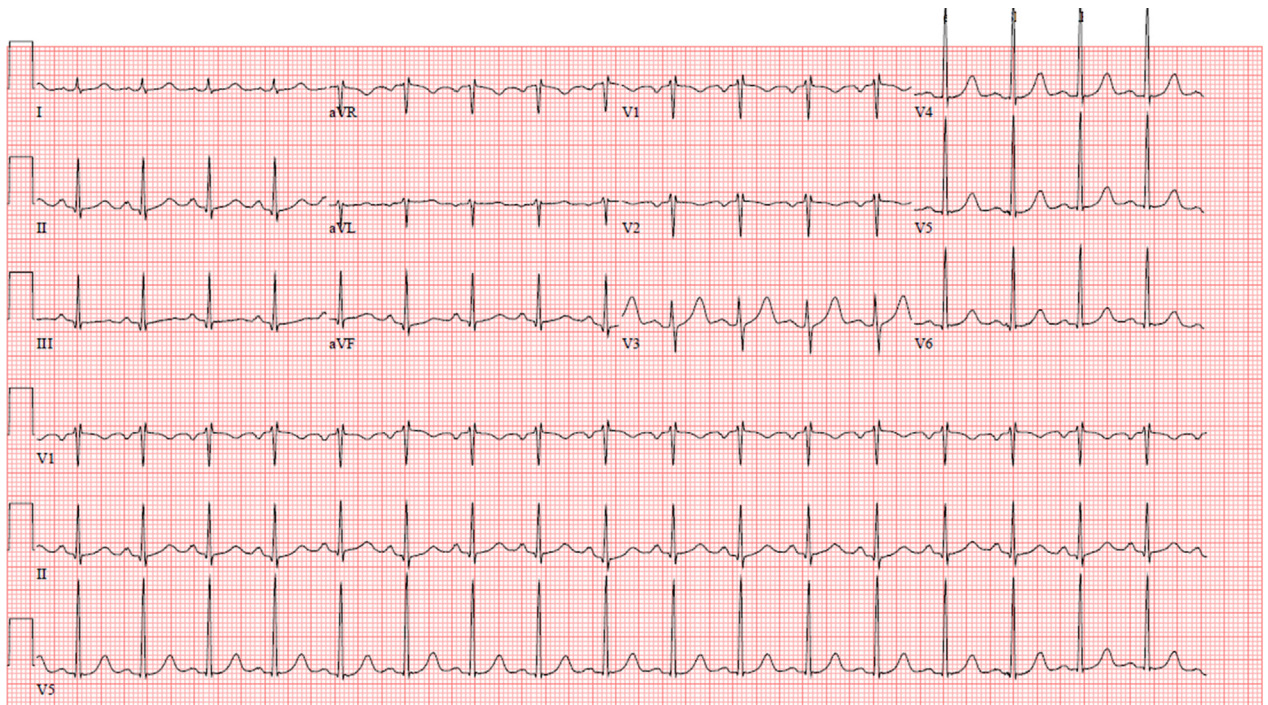
Left M1 occlusion (red arrow) (left). Retrograde supply of fusiform aneurysm (yellow arrow) at the bifurcation of left MCA (right).

**FIGURE 2** Transesophageal Echocardiography



A 13 mm frond-like mass attached to the A3 (medial) scallop of the anterior mitral leaflet (left). Large flail gap of 3-3 × 12 mm/area 45 to 50 mm<sup>2</sup>, associated with very severe 4+ eccentric MR (right). LA = left atrium; LV = left ventricle.

**FIGURE 3** Electrocardiogram



Sinus tachycardia with evidence of left atrial enlargement and incomplete right bundle branch block.

**TABLE 1** Case Reports of Infections Caused by *Streptococcus alactolyticus*

First Author	Age, y/Sex	Valve Involvement	Patient's Presentation	Probable Source of Infection	Past Medical History	Outcome
Almeida et al <sup>3</sup>	65/female	Mitral and aortic valves	Left MCA M2 segment mycotic aneurysm, renal and splenic septic emboli, intraparenchymal and subarachnoid hemorrhage	Dental cleaning	Hypertrophic obstructive cardiomyopathy and mitral regurgitation	Recovery Cardiac surgery
Cekmen et al <sup>4</sup>	64/male	Aortic and mitral valves	Acute hypoxic respiratory failure, metabolic acidosis, and symptoms of acute heart failure	Not identified	Coronary artery bypass grafting	Recovery
Mylonas et al <sup>5</sup>	64/male	Mitral valve	Acute myocardial ischemia, asymptomatic brain emboli, splenic infarcts, and unconfirmed spondylodiscitis	Dental abscess	Type 2 diabetes mellitus and MVP	Recovery Cardiac surgery
Vinciguerra et al <sup>6</sup>	69/male	Mitral valve	Spondylodiscitis of the neck, synovitis of the foot, and 3 <sup>rd</sup> -degree AV block	Not identified	Hepatic steatosis and a hemicolectomy for colon cancer 30 years before presentation	Recovery Cardiac surgery
Purnama Dewi et al <sup>7</sup>	25/female	Mitral valve	Chest pain and palpitations, thrombocytopenia, anemia, and septic embolism	Unclear, but authors highlighted urinary tract infection	Not significant	Death

AV = atrioventricular; MCA = middle cerebral artery; MVP = mitral valve prolapse.

second case report of *S alactolyticus* IE complicated by an infective cerebral artery aneurysm.

In most cases, the source of infection is unclear. The most common sources are dental and gastrointestinal lesions, but this patient had no dental abscess or gastrointestinal symptoms. The patient was undergoing investigation for antiphospholipid antibody syndrome due to joint pain, fluctuating fatigue, and leg swelling after standing at work. She did not have any history of miscarriages or clots. This could potentially be attributed to IE, which can increase antiphospholipid antibodies. The subsequent initiation of aspirin increased risk for hemorrhagic stroke and may have contributed to the presentation. Although the antiphospholipid antibodies were negative, positive results would have required differentiation from IE-induced antibody elevations.

In addition, the patient had a history of MVP, the most common predisposing factor for native valve IE.<sup>5</sup> The American College of Cardiology/American Heart Association guidelines classify mild MVP as stage A MR (at risk, no hemodynamic consequence) and recommend baseline TTE, with no recommendation for further monitoring.<sup>8</sup> The American Academy of Family Physicians recommends clinical follow-up every 3 to 5 years and repeat TTE only if clinical examination changes.<sup>9</sup> Finally, the American College of Cardiology/American Heart Association guidelines for dental prophylaxis discourage prophylaxis for asymptomatic MVP.<sup>10</sup> Given these

guidelines and retrospective considerations, a thorough examination by a longitudinal primary care provider may have triggered an earlier diagnosis via TTE. However, this is the first case in a healthy nonelderly adult, making the circumstances largely unforeseeable. The 13-mm vegetation seen on TTE was incongruent with the large degree of valve destruction manifesting as severe MR, increasing the danger of *S alactolyticus* IE. Quick, successful diagnostics and intervention resulted in a favorable outcome for this patient despite presentation with severe complications.

#### FOLLOW-UP

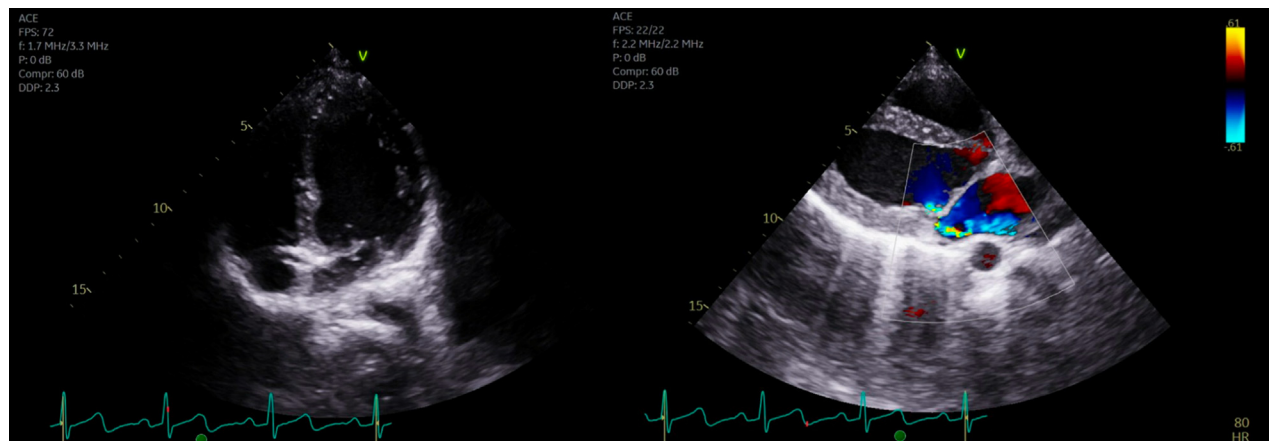
At 4-week follow-up, patient's vegetation was reduced in size and severe MR on TTE (Figure 4). Therefore, ceftriaxone was extended for 2 weeks, and she was scheduled to follow up in 6 months for mitral valve surgery evaluation. The right ICA aneurysms resolved at 3 months' follow-up after antibiotic therapy.

#### CONCLUSIONS

*S alactolyticus* is an exceedingly rare cause of IE but can cause severe disease and complications in a healthy adult, as illustrated in this case. Rapid diagnostic studies and treatment are required to optimize outcomes. Future studies are needed to characterize this species' clinical and epidemiologic features.



**FIGURE 4** Follow-Up Transthoracic Echocardiogram



Small mobile mass attached to the mid anterior mitral leaflet. Decreased vegetation size (left) and severe mitral regurgitation with eccentric MR jet (right).

## FUNDING SUPPORT AND AUTHOR DISCLOSURES

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

**ADDRESS FOR CORRESPONDENCE:** Dr Swarna Chakrabarty, 44432 Pine Drive, Sterling Heights, Michigan, USA. E-mail: [swarna.nemc@gmail.com](mailto:swarna.nemc@gmail.com).

## REFERENCES

1. Baddour LM, Wilson WR, Bayer AS, et al. Infective endocarditis in adults: diagnosis, antimicrobial therapy, and management of complications: a scientific statement for healthcare professionals from the American Heart Association. *Circulation*. 2015;132(15):1435-1486. <https://doi.org/10.1161/CIR.000000000000296>
2. Corredoira J, Grau I, Garcia-Rodriguez JF, et al. Species and biotypes of *Streptococcus bovis* causing infective endocarditis. *Enfermedades Infecc Microbiol Clin Engl Ed*. 2023;41(4):215-220. <https://doi.org/10.1016/j.eimce.2021.08.017>
3. Almeida P, Railsback J, Gleason JB. A rare case of *Streptococcus alactolyticus* infective endocarditis complicated by septic emboli and mycotic left middle cerebral artery aneurysm. *Case Rep Infect Dis*. 2016;2016:9081352. <https://doi.org/10.1155/2016/9081352>
4. Cekmen N, Baysan O, Disbudak E, Gunt C. A rare case of bacterial infective endocarditis caused by *Streptococcus alactolyticus*. *Heart Vessels*. 2019;3(Issue 3):109-113. <https://doi.org/10.24969/hvt.2019.133>
5. Mylonas CC, Gomatou G, Poulakou G, Moraitou E, Syrigos K. Human disease caused by *Streptococcus alactolyticus*: a case report of native valve infective endocarditis and review of the literature. *Monaldi Arch Chest Dis Arch Monaldi Mal Torace*. 2020;90(4). <https://doi.org/10.4081/monaldi.2020.1428>
6. Vinciguerra M, Santamaria V, Romiti S, et al. Case report: *Streptococcus alactolyticus* as a rare pathogen of mitral endocarditis. *Front Cardiovasc Med*. 2021;8:648213. <https://doi.org/10.3389/fcvm.2021.648213>
7. Purnama Dewi I, Damanik I, Purnama Dewi K, Yogiarto M, Andrianto A. Infective endocarditis caused by *Streptococcus alactolyticus* and *Kocuria kristinae* complicated with severe thrombocytopenia: a rare case. *Cardiol Croat*. 2021;16(7-8):246-251. <https://doi.org/10.15836/ccar2021.246>
8. Otto CM, Nishimura RA, Bonow RO, et al. 2020 ACC/AHA guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation*. 2021;143(5):e35-e71. <https://doi.org/10.1161/CIR.0000000000000923>
9. Bouknight DP, O'Rourke RA. Current management of mitral valve prolapse. *Am Fam Physician*. 2000;61(11):3343-3350.
10. Nishimura RA, Carabello BA, Faxon DP, et al. ACC/AHA 2008 guideline update on valvular heart disease: focused update on infective endocarditis: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines: Endorsed by the Society of Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. *J Am Coll Cardiol*. 2008;52:676-685. <https://www.jacc.org/doi/pdf/10.1016/j.jacc.2008.05.008>

**KEY WORDS** endocarditis, mitral valve, murmur, stroke