

# Case of endogenous endophthalmitis caused by *Streptococcus equisimilis*

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**Abstract:** We report a rare case of endogenous endophthalmitis caused by *Streptococcus equisimilis*. A 74-year-old woman with endocarditis developed endogenous endophthalmitis. The patient underwent emergency mitral valvuloplasty, and intravitreal and subconjunctival injections of vancomycin and meropenem. After the surgery, she was treated with topical antibiotics, ointment, intravenous gentamicin and intravenous penicillin G potassium. The causative organism was identified as *S. equisimilis*. *S. equisimilis* should be considered as a pathogen that can cause severe endogenous endophthalmitis.

**Keywords:** endogenous endophthalmitis, group G *Streptococcus*, endocarditis, *Streptococcus equisimilis*

## Introduction

Endogenous endophthalmitis is a rare and destructive disease that has a poor visual prognosis. The Lancefield group G beta-hemolytic streptococci (GGS) have been recognized as pathogens causing serious infections in humans, although GGS can have a commensal relationship when present on the skin, pharynx, intestinal tract, and vagina.<sup>1</sup> The major pathological conditions predisposing GGS infections include malignancy, alcoholism, cardiovascular disease, diabetes mellitus, bone and joint diseases, and cirrhosis of the liver. We report a rare case of endogenous endophthalmitis caused by *Streptococcus equisimilis*, a GGS organism.

## Case report

A 74-year-old woman became confused in her daily living, and the confusion was concomitant with a high-grade fever on April 29, 2008. She was admitted to a local hospital on the following day and was given intravenous ceftriaxone for 9 days. She had a history of cardiac and brain infarctions and was at the postoperative stage of uterine cancer. GGS was detected in cultures of her blood sample and she was suspected to have infective endocarditis. Although the hospital staff had noticed a moderate swelling of her left eyelid since May 1, 2008, an ophthalmologist did not examine her until she was referred to us on May 9, 2008.

Physical examination showed the patient to be a very ill woman with a body temperature of 38°C. Her left eyelids were swollen, and a moderate degree of conjunctival infection with chemosis was observed in her left eye. Ophthalmic examination showed severe anterior chamber inflammation without hypopyon in her left eye. Her left fundus was not visible ophthalmoscopically due to hazy media. Ultrasonography of the posterior segment showed moderately dense infiltrations in the vitreous cavity. Her right eye was normal.

Auscultation of the heart revealed a III/VI systolic murmur at the apex. Transthoracic echocardiography disclosed a mobile mass associated with the mitral valve with moderate

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**Figure 1** Preoperative transthoracic echocardiographic findings showing vegetation on the anterolateral commissure of the mitral valve.

valvular regurgitation (Figure 1). Laboratory tests demonstrated an elevated leucocyte count of  $11850/\mu\text{L}$  with 82% of polymorphonuclear cells, a C-reactive protein level of 10.65 mg/dL, lactate dehydrogenase level of 519 IU/L, amylase level of 175 IU/L, and brain natriuretic peptide level of 450.0 pg/mL.

She was immediately hospitalized and on the same day (May 9, 2008) underwent emergency mitral valvuloplasty and both intravitreal and subconjunctival injections of both 1 mg/mL vancomycin and 1 mg/mL meropenem. After the surgery, she was treated with topical antibiotics (levofloxacin) and ointment (OFLX) for approximately 1 month, intravenous gentamicin (200 mg/day), and intravenous penicillin G potassium (240,000 IU/day) for 9 days. Her general condition and ocular inflammation gradually improved with the medical therapy. However, her best-corrected visual acuity remained at light perception.

Subsequently, cultures from both anterior chamber and vitreous biopsy specimens grew *S. equisimilis*, which was sequenced by polymerase chain reaction. The *S. equisimilis* was found to be susceptible to penicillin G, ampicillin, sulbactam sodium/ampicillin sodium, imipenem/cilastatin, levofloxacin, and vancomycin, and was resistant to erythromycin and clarithromycin.

## Discussion

*S. dysgalactiae* subsp. *equisimilis* hosts variants within the Lancefield group A, C, L, and G carbohydrates, and was

recently determined by gene sequencing to be a subspecies of Group G of *S. equisimilis*. Exogenous GGS endophthalmitis has been reported following cataract surgery, penetrating keratoplasty and trabeculectomy.<sup>2</sup> On the other hand, endogenous GGS-related endophthalmitis is extremely rare.<sup>1</sup> So far, there have been only 8 cases of endogenous GGS-related endophthalmitis;<sup>3–5</sup> 4 cases associated with endocarditis, 1 with cellulites of the foot, 1 with facial trauma, 1 with an abscessed tooth, and 1 of unknown origin. In addition, *S. equisimilis* is of importance as causative bacteria of endocarditis. We demonstrated a case of an endogenous GGS-related endophthalmitis where *S. equisimilis* was first identified from both anterior chamber and vitreous biopsies, and where identification was also first made by polymerase chain reaction.

The first-line therapy of *S. equisimilis*-induced infections is penicillin. Besides penicillin, *S. equisimilis* has also been shown to be sensitive to cephem and carbapenem antibiotics. *S. equisimilis* was sensitive to all of the antimicrobial agents we administered. In our case, we suggest that a delay in the diagnosis would have worsened the general conditions of the patient, and would then lead to a poorer prognosis. At present, the efficacy of immediate ocular therapies including vitrectomy and intravitreal antibiotics against GGS-related endogenous endophthalmitis is still controversial.<sup>3</sup> Only further investigations will answer this question.

## Disclosure

The authors have no proprietary or financial interest in any products used in this study.

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