

Group B Streptococcal Metastatic Endophthalmitis in an Elderly Man Without Predisposing Illness

Kenji Matsuo,* Kazuo Nakatuka,*
Yoshio Yano,[†] Wakako Fujishima[‡] and Kenji Kashima[‡]

*Department of Ophthalmology, Oita Medical University, Oita, Japan;

[†]Department of Ophthalmology, Nankai Hospital, Saeki, Japan;

[‡]Department of Pathology, Oita Medical University, Oita, Japan

Abstract: Our patient, an 83-year-old man, suddenly experienced acute lumbago and was prescribed bed rest. Later, pneumonia was diagnosed, even though he had no predisposing illness, and endophthalmitis developed in both eyes. Cultures of anterior chamber and vitreous specimens were positive for group B streptococcus. Treatment with systemic antibiotics, to which this bacteria is sensitive, was begun and his condition gradually improved. Nevertheless, the patient became blind in his right eye and the eye was enucleated. Histopathologic examination showed metastatic endophthalmitis with retinal detachment. Multiple microabscesses were found in the thickened choroid. We speculated that organisms disseminating from the microabscesses had caused the metastatic endophthalmitis. **Jpn J Ophthalmol 1998;42:304–307** © 1998 Japanese Ophthalmological Society

Key Words: Group B streptococcus, metastatic endophthalmitis, pathology.

Introduction

Infectious endophthalmitis has been classified into two groups: (1) exogenous and (2) endogenous.^{1–4} The first form occurs after ocular surgery, penetrating trauma, and corneal ulcer. The second form is uncommon and has been called metastatic endophthalmitis. Metastatic endophthalmitis represents 5.5–30% of all cases of endophthalmitis.^{2,4,5} The histopathological observation of metastatic bacterial endophthalmitis, however, has never, to our knowledge, been reported in detail.

Group B streptococcus (GBS) is isolated from the lower gastrointestinal tract of adults in general and from the genital tract of pregnant women in particular. It is a well-known pathogen in neonatal and postpartum patients.^{6–8} In recent years, GBS infection has also been reported as a serious condition in adults,^{1,9} and is known to cause metastatic endophthalmitis.^{10,11} We believe our patient is the first case of metastatic endophthalmitis to be reported in Ja-

pan. The histopathologic findings of this case are reported in this paper.

Case Report

An 83-year-old Japanese man experienced sudden, severe lumbar pain at work on November 9, 1994. The patient had been in good health and had been working as a milk delivery man until that time. He had renewed his driving license the year before, and his corrected visual acuity was better than 0.8 in both eyes. He was admitted to the orthopedic surgery section at the hospital for acute lumbago, because movement of his body was markedly limited in all directions. On the second hospital day, he became febrile. On the third day, he had a cough with expectoration. The coughing intensified the severe pain he experienced in the right upper side of his chest and lumbar region. On the fourth hospital day, he noted pain and epiphora in the left eye, and complained of progressive visual loss. These symptoms also appeared in the right eye and increased rapidly.

Ophthalmic consultation was obtained on the sixth hospital day. His visual acuity was light perception in the right eye and no light perception in the

Received: August 16, 1996

Address correspondence and reprint requests to: Kenji MATSUO, MD, Department of Ophthalmology, Oita Medical University, Hasama-machi, Oita, 879-55 Japan

left. Bilateral intraocular pressure was 20 mmHg. Both eyes showed severe perilimbal injection and mild corneal edema. Slit-lamp examination disclosed opacities of the lens and moderate anterior chamber cells without hypopyon. Visualization of the fundus was impaired by opacities in the optic media. B-scan and computed tomography (CT) demonstrated vitreous opacity with retinal detachment, but no abnormality in the retrobulbar or parabulbar region. Although metastatic endophthalmitis was suspected, therapeutic vitrectomy was not performed. Both eyes were treated with 0.3% ofloxacin (Tarivid) ophthalmic solution. A regimen of oral cefdinir was started, and intravenous antibiotics (cefotiam dihydrochloride) were administered.

Laboratory Investigations

Results of laboratory investigations were normal except for an erythrocyte sedimentation rate of 34 mm/hour and C-reactive protein of 25.7 mg/dL. The peripheral blood sample showed 6,400 leukocytes with a slight left shift of the granulocytic series. Cultures of blood and urine were negative. Systemic examinations were performed. Chest x-ray film revealed an infiltrative shadow in the right upper lung field, which was interpreted as right upper lobe pneumonia. Right pleural effusion was identified by CT scan. The physical examinations showed no primary focus of infection. There was no disorder of the urinary tract or heart, other than hypertension.

To identify the infecting organism, anterior chamber irrigation and lensectomy were performed in the right eye on the eighth hospital day. The ocular findings, however, became markedly worse. On the thirteenth hospital day, the right eye was enucleated because the cornea was perforated by hypopyon. Culture of the anterior chamber and vitreous specimens yielded group B β -hemolytic streptococci (*Streptococcus agalactiae*), which are sensitive to ceftazidime and minocycline hydrochloride but resistant to cefdinir and cefotiam dihydrochloride. After the bacteriologic studies were performed, systemic antibiotics (ceftazidime) were administered. The patient's symptoms improved, and the lesions in the right lung disappeared.

Pathologic Findings

The resected globe was cut hemispherically and immediately fixed with 10% formaldehyde. The tissues were dehydrated and embedded in paraffin. Thin sections, about 5- μ m thick, were prepared and deparaffinized. Some of the sections were stained

with hematoxylin-eosin, and the remaining were studied with Gram, PAS, elastica van Gieson, and Mallory-Azan stains. There was no remarkable change in the sclera or peribulbar tissue except for focal inflammatory cell infiltration. The cornea was necrotic with perforation. The necrotic iris and vitreous were incarcerated in the perforated cornea (Figure 1). The histopathologic examinations showed the vitreous cavity contained necrotic tissue, blood, and numerous neutrophils. Total retinal detachment was found, and the retinal pigment epithelium was attached to the choroid. Characteristic of metastatic endophthalmitis, the thickened choroid was infiltrated by inflammatory cells with scattered microabscesses (Figures 2, 3). The microabscesses inside the ciliary body had destroyed Bruch's membrane and come in contact with the inflammatory cells in the vitreous cavity (Figure 4). The organism was invisible with Gram and PAS stains.

Discussion

Metastatic endophthalmitis usually occurs in chronic medical conditions, especially in association with diabetes mellitus, cardiac disease, malignancy, intravenous drug use, and immunosuppressed conditions.^{3,10-12} In the present case, the patient was a man of advanced age with no predisposing illness. Various organisms responsible for metastatic endophthalmitis are spread through the bloodstream. Metastatic endophthalmitis is caused more often by bacteria than by fungi.^{3,11-13} It is reported that metastatic bacterial endophthalmitis is mainly because of Gram-negative bacteria.² However, there are others

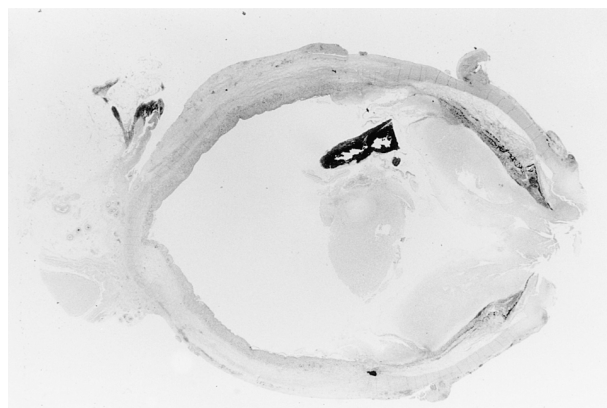


Figure 1. Perforated cornea showed prolapsed intraocular contents consisting of necrotic tissue, blood coagula, and numerous neutrophils.

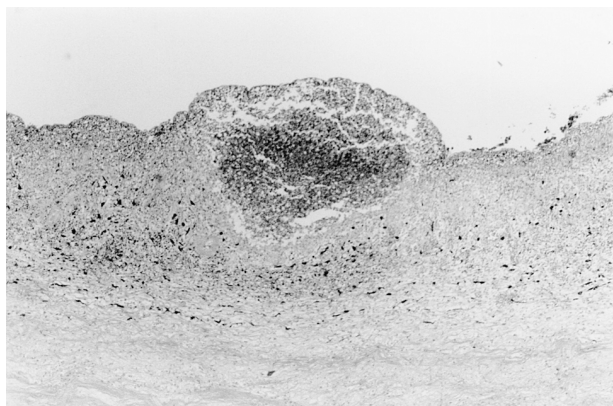


Figure 2. Microabscess appears in thickened choroid. (Hematoxylin-eosin staining, original magnification $\times 50$).

who believe that the most common bacteria of metastatic endophthalmitis is Gram-positive.^{11,12}

Group B streptococcus infection causes serious disease in adults as well as in neonates. Adults with GBS infection often have diabetes mellitus, malignancy, or liver disease.⁶ The most usual clinical manifestations of GBS infection are decubitus ulcer, cellulitis, pneumonia, pyelonephritis, bacteremia, and endocarditis in adults.⁶⁻⁹ Group B streptococcus is also known as a source of metastatic bacterial endophthalmitis in adults, but it is a rare pathogen.¹⁴⁻¹⁶ It generally exists in the female genital tract and in the lower gastrointestinal tract of adults of both sexes. Group B streptococcus from the respiratory tract has been isolated on occasion.^{7,9} Farley et al¹⁷ have reported that the risk of GBS infection is high in elderly persons (≥ 60 years).⁶ It is reported that pulmonary infection because of GBS occurs in the

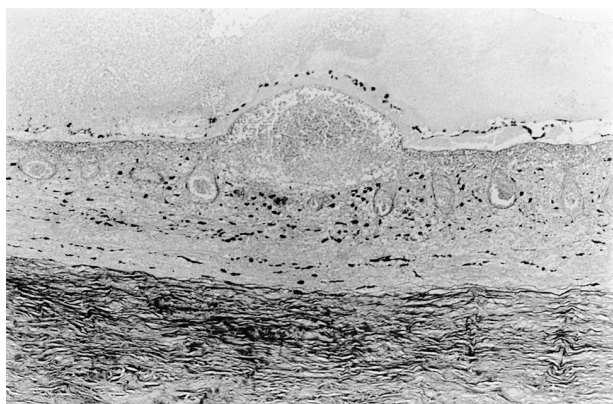


Figure 3. Retina is totally detached from RPE. Microabscess occurs outside Bruch's membrane. (elastica van Gieson's stain, original magnification $\times 50$).

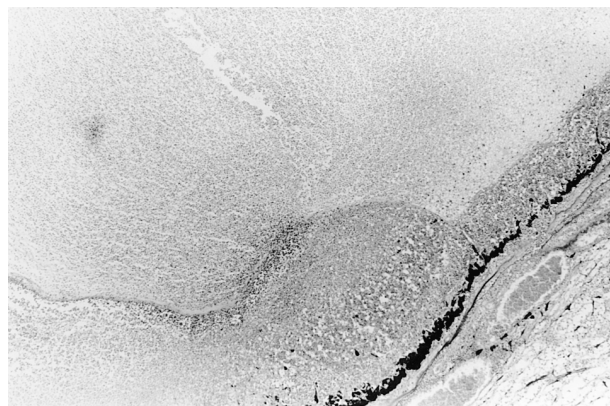


Figure 4. Abscess inside ciliary body has destroyed Bruch's membrane and eroded into vitreous. (Hematoxylin-eosin staining, original magnification $\times 50$).

elderly.^{8,18} We believe that the risk of infection with GBS is increased in older patients who are prescribed bed rest. In our patient, no underlying disease was noted before the onset of acute lumbago; nevertheless, he developed pneumonia, which was suspected to be the focus of his metastatic endophthalmitis.

Greenwald et al¹² have reported the following pathogenesis of metastatic endophthalmitis. Organisms are carried from the primary focus of infection to the retinal or uveal circulation by hematogenous dissemination. The organisms transverse the blood-ocular barrier and invade tissue in the eye. Naumann and Naumann¹⁹ have demonstrated that disseminated organisms form microabscesses in metastatic mycotic endophthalmitis.

In the present study, histopathologic examination revealed multiple microabscesses in the choroid and leukocytic infiltration in the vitreous and choroid. We believe that microabscesses may be a histopathologic characteristic of metastatic endophthalmitis.

References

1. Forster RK. Endophthalmitis: diagnostic cultures and visual results. *Arch Ophthalmol* 1974;92:387-92.
2. Hatano H, Inoue K, Matoba H, et al. Endophthalmitis in Japan: a nationwide study with reference to type and etiology. *Nippon Ganka Gakkai Zasshi (Acta Soc Ophthalmol Jpn)* 1991;95:369-76.
3. Meredith TA. Ocular microbiology: clinical microbiology of infectious endophthalmitis. In: Ryan SJ, ed. *Retina*. St Louis, MO: Mosby, 1994:203-13.
4. Rowsey JJ, Newson DL, Sexton DJ, Harms WK. Endophthalmitis: current approaches. *Ophthalmology* 1982;89:1055-66.
5. Puliafito CA, Baker AS, Haaf J, Foster CS. Infectious endophthalmitis: review of 36 cases. *Ophthalmology* 1982;89:921-9.

6. Opal SM, Cross A, Palmer M, Almazan R. Group B streptococcal sepsis in adults and infants. *Arch Intern Med* 1988;148:641-5.
7. Verghese A, Mitreault K, Arbeit RD. Group B streptococcal bacteremia in men. *Rev Infect Dis* 1986;8:912-7.
8. Wessels MR, Kasper D. The changing spectrum of group B streptococcal disease. *N Engl J Med* 1993;328:1843-4.
9. Bayer AS, Chow AW, Anthony BF, Guze LB. Serious infections in adults due to group B streptococci. Clinical and serotypic characterization. *Am J Med* 1976;61:498-503.
10. Farber BP, Weinbaum DL, Dummer JS. Metastatic bacterial endophthalmitis. *Arch Intern Med* 1985;145:62-4.
11. Okada AA, Johnson RP, Liles WC, D'Amico DJ, Baker AS. Endogenous bacterial endophthalmitis: report of a ten-year retrospective study. *Ophthalmology* 1994;101:832-8.
12. Greenwald MK, Wohl LG, Sell CH. Metastatic bacterial endophthalmitis: a contemporary reappraisal. *Surv Ophthalmol* 1986;31:81-101.
13. Patel AS, Hemady RK, Rodrigues M, Rajagopalan S, Elman MJ. Endogenous fusarium endophthalmitis in a patient with acute lymphocytic leukemia. *Am J Ophthalmol* 1994;117:363-8.
14. Mao LK, Flynn HW, Miller D, Pflugfelder SC. Endophthalmitis caused by streptococcal species. *Arch Ophthalmol* 1992;110:798-801.
15. Nagelberg HP, Petashnick DE, To KW, Woodcome HA. Group B streptococcal metastatic endophthalmitis. *Am J Ophthalmol* 1994;117:498-500.
16. O'Brart DPS, Eykyn SJ. Septicaemic infection with group B streptococci presenting with endophthalmitis in adults. *Eye* 1992;6:396-9.
17. Farley MM, Harvey RC, Stull T, et al. A population-based assessment of invasive disease due to group B streptococcus in nonpregnant adults. *N Engl J Med* 1993;328:1807-11.
18. Verghese A, Berk SL, Boelen LJ, Smith JK. Group B streptococcal pneumonia in elderly. *Arch Intern Med* 1982;142:1642-5.
19. Naumann GOH, Naumann LR. Intraocular inflammations: clinical classification of intraocular inflammation. Infectious intraocular inflammations. In: Apple DJ, trans. *Pathology of the eye*. New York: Springer-Verlag, 1986:127-47.