Endophthalmitis Caused by *Acinetobacter baumannii*: Report of Two Cases

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Received 11 August 2007/Returned for modification 25 November 2007/Accepted 23 December 2007

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**Published ahead of print on 9 January 2008.**

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**CASE REPORTS**

**Case 1.** A 67-year-old female presented with a medical history of hypertension and cardiovascular disease, and a coronary artery bypass graft had been performed 12 years prior to presentation. She complained of a sudden onset of blurry vision and red eyes for 1 day. She had also had fever, chills, poor appetite, diarrhea, and pain in the lower abdomen for 1 week. Her visual acuity was 20/400 in the right eye, and she was able to see hand motion in the left. There was no ocular trauma or history of surgery. On examination, the anterior segments of both eyes demonstrated fine keratic precipitates and fibrin over their pupillary margins. In each eye, the intraocular pressure was 12 mm Hg, and mild nuclear sclerosis was found. An examination of the fundus revealed grade III opacity with central retinal artery occlusion in the left. Four months later, the final visual acuity was 20/60 in the right eye and the ability to see hand motion in the left. An afferent pupillary defect was revealed in the left eye. On examination of the fundus showed that the right eye appeared normal but that the left contained a pale disc with optic nerve atrophy. Fluorescein angiography revealed delayed arterial filling, a prolonged arteriovenous transit time, and retinal vessel and disc staining.

On day 10, the inflammation of the vitreous and anterior chambers decreased, and her visual acuity recovered to 20/100 in the right eye and the ability to see hand motion in the left. An afferent pupillary defect was revealed in the left eye. An examination of the fundus showed grade I vitreous opacity in the right eye and grade II vitreous opacity with central retinal arterial occlusion in the left. Four months later, the final visual acuity was 20/60 in the right eye and the ability to see hand motion in the left. The anterior segment demonstrated no reaction except for residual posterior synechiae. An afferent pupillary defect was revealed in the left eye. On examination of the fundus showed that the right eye appeared normal but that the left contained a pale disc with optic nerve atrophy. Fluorescein angiography revealed delayed arterial filling, a prolonged arteriovenous transit time, and retinal vessel and disc staining.

**Case 2.** A 27-year-old man with a history of radial keratotomy suffered from a corneal laceration and a traumatic cataract in the left eye due to an ocular blunt injury 2 years prior to presentation. Because of corneal opacity, penetrating keratoplasty was performed 1 year prior to presentation. As a result of a rejected graft, he received penetrating keratoplasty with an intraocular lens implant. Two weeks later, postkeratoplasty endophthalmitis was diagnosed, and he was referred to Chang Gung Memorial Hospital in Taoyuan, Taiwan. His visual acuity was 20/20 in the right eye and light perception in the left. On examination, the graft was very edematous with a large, white infiltrate. There was a significant reaction in the anterior chamber, and a 4-mm hypopyon was present. No fundus details were observed. In addition, ocular ultrasonography showed diffuse opacity in the vitreous cavity (Fig. 1). Vancomycin (1 mg/0.1 ml) and amikacin (0.25 mg/0.1 ml) were intravitreally injected in both eyes immediately.

On day 6, blood cultures (Bactec 9240 instrument; Becton, Dickinson and Company, Sparks, MD) revealed the organism *Acinetobacter baumannii*; however, the results of the urine, aqueous humor, and vitreous cultures were negative. The organism was a nonmotile, oxidase-negative coccobacillus. Moreover, the isolate was identified as *A. baumannii* on the basis of biochemical testing (API 20E; bioMérieux, Marcy l’Etoile, France). Antibiotic susceptibility testing was determined by broth microdilution methods, and the results are shown in Table 1.

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*V* Received 11 August 2007/Returned for modification 25 November 2007/Accepted 23 December 2007

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² Published ahead of print on 9 January 2008.
operative microscopy during the penetrating keratoplasty; however, a culture of corneoscleral rim specimens yielded an *A. baumannii* isolate that was resistant to all antibiotics but imipenem. Meanwhile, the history of the donor was not available. On the basis of the drug sensitivity of the organism, imipenem (100 μg/0.1 ml) was injected intravitreally three consecutive times during a 2-week interval. Six weeks later, the condition of the left eye had deteriorated significantly, with no light perception. The patient was no longer in pain and was no longer receiving treatment.

The genus *Acinetobacter* is currently classified in the family *Moraxellaceae* and consists of bacteria that are nonmotile, oxidase-negative, gram-negative coccobacilli. *Acinetobacter* species have a wide habitat in the environment and are found frequently in most water and soil samples. *Acinetobacter* organisms have been cultured from the moist skin of healthy humans; increased colonization of the skin and the respiratory and gastrointestinal tracts occurs in individuals in long-term care facilities and hospitals. Although this organism is associated primarily with nosocomial infections, it has also been involved in cases of community-acquired infections (3). However, the circumstances that allow *Acinetobacter* to assume a pathogenic role are not really well understood. *A. baumannii* is the species that is involved most frequently in infections of humans, but a natural reservoir for *A. baumannii* outside the hospital environment has not yet been identified. A variety of human infections caused by *Acinetobacter* species have been reported, including pneumonia, endocarditis, meningitis, skin and wound infections, peritonitis, osteomyelitis, and urinary tract infection (3). There are few reports of postoperative and posttraumatic endophthalmitis caused by *Acinetobacter* species (1, 6). To our knowledge, there is no report of endogenous endophthalmitis caused by *A. baumannii* yet. We report two cases of *A. baumannii* endophthalmitis, one with community-acquired endogenous endophthalmitis and the other with nosocomial postkeratoplasty endophthalmitis.

Many strains of *Acinetobacter* are highly resistant to antimicrobial agents (5). The most effective antimicrobial preparations tested are meropenem, imipenem, and colistin; however, carbapenem resistance is now becoming common (2, 3, 5, 7, 9). The organism isolated from the first patient was susceptible to amikacin, ceftazidime, gentamicin, and imipenem; however, the organism isolated from the second patient was susceptible only to imipenem, which is currently not commonly used for patients with endophthalmitis. Thus, different susceptibilities of isolates may lead to different visual outcomes for patients.

In the first case, the patient achieved a favorable final visual acuity in the right eye but a poor visual outcome in the left eye. In the second case, the patient did not achieve a favorable visual outcome in the right eye.

### Table 1. Antibiotic-susceptibility patterns of *A. baumannii* isolates from two cases

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Case 1 (MIC [μg/ml])</th>
<th>Case 2 (MIC [μg/ml])</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amikacin</td>
<td>S (2)</td>
<td>R</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>S (2)</td>
<td>R</td>
</tr>
<tr>
<td>Imipenem</td>
<td>S (2)</td>
<td>S</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>S (4)</td>
<td>R</td>
</tr>
<tr>
<td>Cefazidime</td>
<td>S (4)</td>
<td>R</td>
</tr>
<tr>
<td>Cefepime</td>
<td>S (4)</td>
<td>R</td>
</tr>
<tr>
<td>Piperacillin</td>
<td>S (16)</td>
<td>R</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>I (≥16)</td>
<td>R</td>
</tr>
<tr>
<td>Cephalothin</td>
<td>R (≥32)</td>
<td>R</td>
</tr>
<tr>
<td>Cefamandole</td>
<td>R (≥32)</td>
<td>R</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td></td>
<td>R</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td></td>
<td>R</td>
</tr>
</tbody>
</table>

* S, susceptible; R, resistant; I, intermediate.

![FIG. 1. Ocular ultrasonography showing diffuse opacity in the vitreous cavity and choroidal thickening (arrows).](image-url)
because of central retinal artery occlusion. Retinal vascular occlusion caused by bacterial endophthalmitis is not uncommon, and it is one of the most critical factors causing poor visual outcomes for patients with endophthalmitis. In addition, septic emboli and regional vascular reactions are the two main causes of central retinal arterial occlusion in patients with bacteremia and endogenous endophthalmitis (4). For the second case, the donor cornea was placed in Optisol-GS medium, which has antimicrobial efficacy against gram-positive and -negative bacteria (8). In most countries, such as the United States and Taiwan, it is not required for eye banks to culture donor corneas. However, Optisol-GS medium does not inhibit the growth of A. baumannii. Because of a contaminated donor cornea and an organism highly resistant to multiple antimicrobial agents, the second patient did not recover his vision. Therefore, donor corneas should be carefully observed by using slit lamp microscopy before the operation. They should be uniformly clear, with no microinfiltrates. The fact that corneal storage media do not inhibit A. baumannii growth increases the probability of corneal-graft contamination after penetrating keratoplasty.

In conclusion, we report two rare cases of A. baumannii endophthalmitis, one with community-acquired endogenous endophthalmitis and the other with hospital-acquired, postoperative endophthalmitis. Although endophthalmitis caused by A. baumannii is rare, ophthalmologists should be alert to the possibility of patients having endogenous endophthalmitis or a graft ulcer with endophthalmitis when performing penetrating keratoplasty.

We have no relevant conflicts of interest for this article.

REFERENCES