First report of acute postoperative endophthalmitis caused by *Rothia mucilaginosa* after phacoemulsification

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Abstract

We aimed at reporting the first case of rapidly progressive acute postoperative endophthalmitis after phacoemulsification cataract surgery in an immunocompetent patient caused by *Rothia mucilaginosa*. An immunocompetent patient manifested endophthalmitis signs 48 hours after an uncomplicated cataract surgery by phacoemulsification. A bacteria of the family *Micrococcaeae* was cultured in the vitreous biopsy, namely *R. mucilaginosa*. The patient did not show a favorable clinical response after vitrectomy and systemic, intravitreal, and topical fortified antibiotics. The patient's eye was very painful, and consequently, it deemed necessary to perform an enucleation. *R. mucilaginosa* may be an aggressive etiologic agent for postoperative endophthalmitis. Although the isolated *R. mucilaginosa* was susceptible to empirical treatment, it was impossible to control the infection with standard treatment, probably due to its ability to create a biofilm around the intraocular lens.

Introduction

Cataract surgery is one of the most common eye operations performed worldwide. Although cataract surgery is highly effective and relatively safe, owing to the enormous numbers, even uncommon surgical complications could be potentially harmful for many patients.1 Endophthalmitis is one of the most serious complications of cataract surgery, affecting around 0.1% of the cases, and often resulting in severe visual impairment.2

This complication often occurs sporadically, and in such situations, the common source of infection may be due to the conjunctival flora of the patient. The major pathogens are coagulase-negative *Staphylococci* (70%), *Staphylococcus aureus* (10%), streptococci (9%), other Gram-positive cocci, including enterococci and mixed bacteria (5%), and Gram-negative bacilli (6%). The fact that Gram-positive bacteria cause >95% of the cases reflect the usual pathogenesis, *i.e.* contamination of the aqueous humor with skin bacteria flora during surgery.1 However, unusual germs causing the infection are sometimes isolated and should be suspected in cases with a non-typical evolution.

Case Report

A 65 year-old female patient was urgently admitted to a hospital emergency room 48 hours after a cataract surgery, referring to red eye and vision decrease in the operated eye. Visual acuity on the initial exam was hands movement in the right eye and 20/40 in the left eye. A hydrophobic acrylic aspheric intraocular lens was used. Ophthalmological examinations showed conjunctival injection in the right eye, hypopyon, 3+ cells in anterior chamber and severe vitreitis with no fundus view. Acute post-cataract endophthalmitis was suspected. She was hospitalized and 23G pars plana vitrectomy was immediately performed and a vitreous biopsy was taken for culture. Additionally, she was treated with topical ocular applications of fortified tobramycin (15 mg/mL) and ceftazidime (50 mg/mL) every hour and with intravitreal injections of vancomycin (1 mg/0.1 mL) and ceftazidime (2 mg/0.1 mL) after the vitrectomy and 2 and 4 days after operation. Intravenous antibiotics (1 g of vancomycin) were also administered twice a day, 500 mg ceftazidime/12 hours, as well as the administration of systemic corticosteroid after 24 hours (oral prednisone 1 mg/kg/day). Because of the bad evolution after 36 hours, systemic treatment was then empirically changed to linezolid 600 mg and moxifloxacin 400 mg, twice a day.

Vitreous was cultured in blood agar, chocolate agar (incubated 48h in microaerophilic conditions) and thiogycollate broth; and was isolated in an all media pure culture of Gram-positive cocci, forming white colonies and catalase positive, which was identified by the Microbiology Laboratory as *Rothia mucilaginosa* through matrix-assisted laser desorption/ionization-time of flight (MALDI-TOF, Bruker Daltonics, Bruker Corporation, Billerica, MA, USA). Direct Gram stain was negative. Antimicrobial sensitivity test was done by the Kirby-Bauer method, being suscepti-
leted Gram-positive cocci that can appear in pairs, tetrads, or irregular clusters. It is a facultative anaerobic bacterium, which grows well on most nonselective media and in standard blood culture systems. On sheep blood and chocolate agar, the bacterium forms clear to gray/white, non-hemolytic, mucoid or sticky colonies, which adhere to the agar surface. It can be difficult to distinguish it from coagulase-negative staphylococci, micrococci, and streptococci based on the catalase test result. Its inability to grow in 6.5% sodium chloride and its ability to hydrolyze gelatin and esculin distinguish it from species of Staphylococcus, Micrococcus, and Enterococcus genera. Identification from automatic methods should correlate with phenotypic identification; otherwise, genetic sequencing may be required to identify this organism. It is an infrequent pathogen, mostly affecting immunocompromized hosts. Recently, infections in immunocompetent hosts have been described in various organ systems, including patients with pneumonia,5,6 bacteremia,7 and septic arthritis.8 Endocarditis is the most commonly reported clinical entity caused by this microorganism.9 It has been reported in two cases of eye infection, a postoperative endophthalmitis in a 91-year-old male and a keratitis in vitamin A deficiency.10,11 Evisceration was performed in both cases. The known risk factors for this infection are immunosuppression, parenteral drugs, alcoholism, diabetes, neoplastic and valvular disease, but our patient did not present any of these. None of the reported patients with ocular infections caused by R. mucilaginosa had these risk factors, so it is possible that intraocular infections could be irrelevant. In this sense, the source of the infection in our case remains unknown. As mentioned, R. mucilaginosa is part of the normal flora of the upper respiratory tract and oral cavity but has not been isolated in normal conjunctival flora. In our opinion self-contamination of the patient could be the origin of the infection, but contamination of eye drops used in the perioperative period with R. mucilaginosa is also a possibility. Unfortunately, a search of R. mucilaginosa in the eye drops was not performed when the patient was admitted in the hospital. It would have been of interest to demonstrate the origin of the contamination. However, it was reported that R. mucilaginosa is able to colonize a foreign body as a vascular catheter.9 The organism’s ability to produce a biofilm, similar to other Gram-positive bacteria, is believed to be a key pathogenic mechanism. The physical protective layer provided by the biofilm presumably facilitates adhesion of the organisms to devices and renders them relatively refractory to medical therapy. Antibiotic therapy alone is usually ineffective without surgical removal of the infected device. This could better support the failure of antibiotic treatment.

Conclusions

To our knowledge, this is the second case report of R. mucilaginosa endophthalmitis after a cataract surgery and the first after phacoemulsification. It is increasingly recognized as an emerging opportunistic pathogen associated with eye infections and it may be difficult to identify. Physicians should be aware of this organism when treating nonresponding patients infected with Gram-positive bacteria in ocular infections.

References